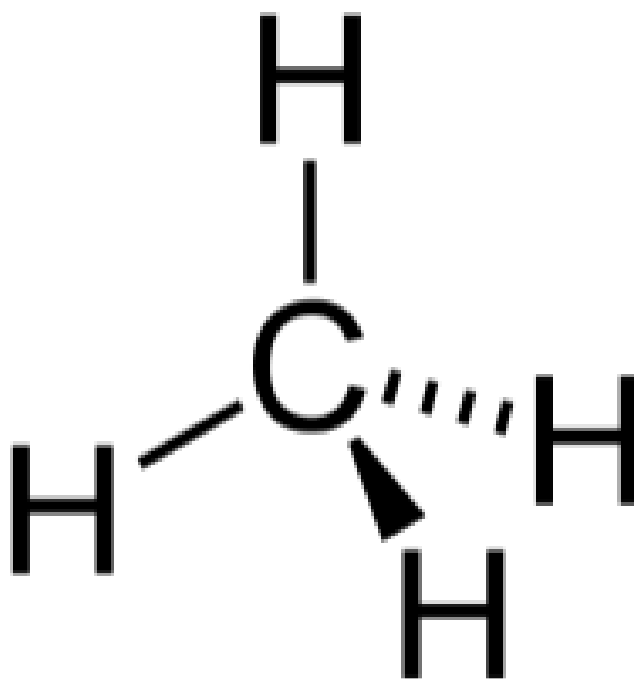


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The tetravalent logic in  
Mathematics & Physics

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**Abstract**

In this work, we solve the main mathematical puzzles of the UMMO file which contains several thousand postal letters sent since the 1960s addressing many fields such as philosophy, mathematics, human sciences, biology, cosmology, theoretical physics, among others. "The UMMO affair" refers to more than 200 listed documents, representing at least 1300 typed pages (the "Ummite letters"), which are said to have been sent since 1966 to numerous recipients, in particular in Spain and France by editors - the Ummites - claiming to be extraterrestrials on an observation mission on Earth and which have four centuries of technological advance on the terrestrial human technologies. We demonstrate the importance of angular tetravalent logic in mathematics and theoretical physics. As an example, we give a proof of Fermat's last theorem using angular tetravalent logic, as suggested by the Ummites.

Then, we will pierce the secrets of the universe always using the tetravalent logic, we will explain the reasoning which proves the existence of a twin universe and we give the mathematical formula for the folding of space-time which separates the two twin universes and finally we explain why the curvature of the universe is necessarily negative.

**Keywords:** mathematics, number theory, logic, space-time, general relativity theory, image interpolation, geometry

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Andrew Wiles (in 151 pages) and Sébastien LABLANCHE (demonstration of Fermat's last theorem in 7 pages), the great power of tetravalent logic is violently demonstrated, so the Ummites are right.

**8 Mathematical formula of the space-time folding that separates the two universes and link with the curvature of the universe: the power of hyperbolic geometry.486**

*To my parents Gérard LABLANCHE and Marie-Thérèse LABLANCHE who saved me so many times and who gave me such a beautiful and pure life. I thank them both for what they did for me, my mother and my father, may God send them back to heaven so that they can meet again.*

## 1 Definition of the angle as a length and definition of the angular tetravalent logic

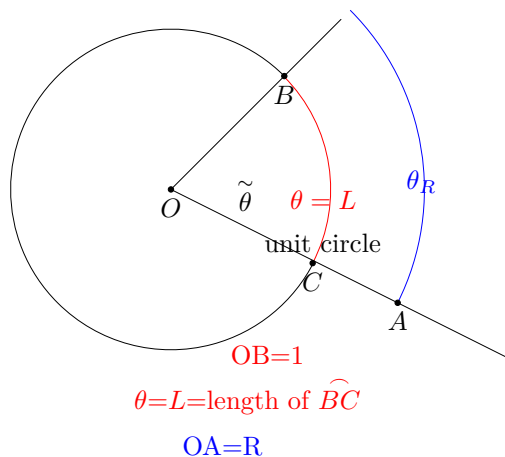
«It is curious that in their blindness, the physicists of the Earth did not attribute to the angle of dimensional character», famous quote of the Ummites. This means that an angle is a length and not a ratio of length. «This is found everywhere except on your planet», said OYAGAA AYOO YISSAA in one of his tweets (the name is simplified to OAY for the Ummites' intimates). OAY is the current leader of the team of about 120 Ummites (extraterrestrial people from the UMMO planet) present at this moment on Earth. In other words, of all the known civilizations by the Ummites in this area of the Milky Way galaxy, the Earth human race is the only one to have made this grotesque mistake, proof that Earth human science is based on conceptual errors that have distanced modern scientists from the true structure of the universe.

1. The geometric angle is an arc of a circle on the unit circle of radius 1. One does not specify  $R=1$  in practice, the unit circle is characterized by  $R=1$  unit of length (1 ul) implicitly. One can consider  $2x(1 \text{ ul})$ ,  $3x(1 \text{ ul})$ ,...,  $10x(1 \text{ ul})$ ,..., up to  $(+\infty)x(1 \text{ ul})$ , these multiplicative coefficients are dimensionless coefficients  $\in [0, +\infty]$ .
2.  $R$  is a dimensionless scaling factor equal to the radius of the circle and it is the unit circle ( $R=1 \text{ ul}$ ) which carries the choice of the unit of length used which is completely free.

$\tilde{\theta}$  is the opening of the angle  $\theta$ ,  $\tilde{\theta}$  does not depend on the radius  $R$  of the circle, so that the angle  $\theta$  is associated with an infinity of arc of a circle  $\theta_R$ , we decide to choose the circle of radius 1, so  $\theta = \frac{L}{R=1}$  or  $\theta = L$  where  $L$  is the length of the arc of a circle  $\widehat{BC}$  formed by the opening of the angle  $\tilde{\theta}$  on the unit circle and the equality  $\theta = L$  is valid for any real number  $R>0$  and  $R=+\infty$ . Therefore  $[\text{ANGLE}]=[\text{LENGTH}]$ .

$\theta_R$  is the arc of a circle formed by the opening of the angle  $\tilde{\theta}$  on the circle of radius equal to  $R$  unit of length. If  $R=0$ , the angle  $\theta$  is reduced to the length of the point O which is not zero.

$\tilde{\theta}$  is the opening resulting from the intersection of the half straight lines (OC) and (OB).



The Ummites are right, a length  $L$  is the opening  $\tilde{\theta}$  of an angle  $\theta$  because the choice of the unit of length is arbitrary (OB=1 Light-year, OB=1 Astronomical unit (AU), OB=1 Mile, OB=1 Meter, OB=1 Centimeter...). The circumference of a circle is equal to  $2\pi R=6.2831..R$  where  $R$  is dimensionless and  $2\pi$  is a length unit coefficient (6.2831 Light-years, 6.2831 Miles, 6.2831 Meters, 6.2831 Centimeters...). The area of a circle is  $\pi R^2=3.14115...R^2$  where  $R^2$  is dimensionless and  $\pi$  is a length unit coefficient (3.14115 Light-years<sup>2</sup>, 3.14115 Miles<sup>2</sup>, 3.14115 Meters<sup>2</sup>, 3.14115 Centimeters<sup>2</sup>...). The number  $2\pi$  is a characteristic length, it is the length of the unit circle, while  $\pi$  is a characteristic area, it is the area of the unit circle.  $R$  is a dimensionless multiplicative factor. The number  $\theta$  is a length between 0 and  $2\pi$ , and the corresponding area bounded by the edges (OB) and (OC) is an area between 0 and  $\pi$ . To go from the unit circle to the circle of radius  $R$ , it suffices to multiply by the factor  $R$ , which is not the radius of the circle but a coefficient equal to the radius. A bit like an electron changes its orbit around the nucleus of an atom.

1-In mathematics, the angle is a figure formed by the intersection of two lines or two planes: What is an angle? It is an imperfect figure, which encloses an indeterminate space, since it does not complete its circumscription. It can therefore never be a question of measuring the space enclosed by an angle. One can only consider in this figure the distance between its two sides. Destutt de Tracy, *Éléments d'idéologie, Logique*, 1805, p. 471.

The angle does not depend on the radius  $R$ , so we cannot delimit an area, but only associate it with the arc corresponding to its circumference on the unit circle  $\widehat{BC}$ , or the area delimited by this arc and the two half lines (OB) and (OC).

2-I believe that the triangle has always had and will always have a sum of angles equal to two rights... Merleau-Ponty, *Phenomenology of Perception*, 1945, p. 444. Reentrant angle. An angle greater than  $180^\circ$ , the opening of which is turned outward :

3.The negative is not less than the positive, but goes in the opposite direction; any quantity can be indifferently considered negative or positive. The negative and the positive together form the complete, that which no longer desires anything. Everything desires its complement; the positive necessarily attracts the negative, the reentrant angle calls the salient angle. Renan, *L'Avenir de la science*, 1890, p. 524.

Salient angle. An angle less than  $180^\circ$ , the opening of which is turned inward. SYNT. Adjacent or continuous angles (see adjacent B); acute angle, angle less than  $90^\circ$ ; internal alternate angles „Angles lying within two parallels, on a different side of the secant“ (Bouillet 1859); external alternate angles „Angles lying outside these parallels and on a different side of the secant“ (Ibid. ); complementary angles, angles whose sum is equal to a right angle; right angle, angle of  $90^\circ$ , where one of the sides is perpendicular to the other; inscribed, angle formed by two chords coming from the same point of a circle; internal, external angles „We name (. ...) internal angles are those angles which are included within two parallels cut by a secant; external angles are those angles outside these parallels (Bouillet 1859); obtuse angle, angle greater than  $90^\circ$ ; - flat, angle of  $180^\circ$ , i.e. whose sides are in the same plane as the other. i.e. whose sides are in the prolongation of each other. The angle is also a space between several planes. Angle polyhedron. A figure formed by several planes passing through the same point (...) and limited to their successive intersections (...), so as to enclose an indefinite portion of space in one direction. (J. Hadamard, *Geom. in Space*, 1921, p. 45). SYNT. Angle dihedron\*, trihedron\*, tetrahedron\*.

In various technical fields, the angle is defined as:

1. The inclination or distance between two lines, usually fictitious; the measurement of this distance or inclination. - [Speaking of a surveyor] To take angles:
4. Only the surveyor and his family took little notice of these great events. The head of the house

was in the fields, busy taking his angles; ... Tœpffer, *Nouvelles genevoises*, 1839, p. 220.

- Field of physics. Angle of incidence. Angle formed by a real or fictitious line and what it meets (cf. *Hist. gén. des sc.*, t. 3, vol. 2, 1964, p. 188) : 5. ... the head sounds (...) owe all their qualities (...) to the angles of incidence and reflection of the floor of the nasal cavity... S. de La Madelaine, *Théories complètes du chant*, 1852, p. 49.

- In particular

a) AERONAUTICS

Angle of attack. Angle formed by the reference plane of the wing and the direction followed :

6. The angle of attack of the air b. and the angle of favorable fall ( $\alpha + \beta$ ), whose ratio is fixed, are independent of the weight... Penaud, *L'Aéron.*, Jan. 1873, p. 14 (Guilb. *Aviat.* 1965). Drift angle:

7. ... the drift angle (...) is [for the aircraft] the difference between the true heading and the course angle. A.-B. Duval, L. Hebrard, *Traité pratique de navigation aérienne*, 1928, p. 51. b)

ANTHROPOL. Facial angle. Angle formed by two imaginary lines, one running from the opening of the auditory canal to the base of the nostrils, the other joining the upper jaw to the most prominent part of the forehead:

8. ... two lines, of which one falls from the forehead, the other coming from the occiput, passes by the lower extremity of the ear, form by their meeting at the upper lip an angle called facial angle, whose more or less acuteness serves to measure the various degrees of intelligence between the beings, from an oyster being, to a man being. For, between these various species there is only plus and minus; so that one can measure geometrically the extent of the mind, as one measures the elevation of the pole. Bonald, *Législ. primitive*, t. 2, 1802, p. 164.

c) ASTRONOMY

Angle of depression :

9. When observing the height of a star on a ship, one is above the surface of the water; the height must be corrected to what it would be if one were just at sea level. The angle of depression is the angle formed by the horizontal plane and the line joining the observer's eye to the line of separation of the sea and the sky. Guyot 1953.

Hourly angles. Those formed at the pole by the planes of the hourly circles and the plane of the meridian; their measure is the arc of the equator between these circles (Bouillet 1859):

10. One can interpret this difference as the right ascension of a fictitious mobile, mobile called "mean sun", whose hourly angle would be equal to the local mean time. V. Kourganoff, *Astron. fondamentale élémentaire*, 1961, p. 65.

d) AUTOM., MECHAN.

Advance angle, stall angle : 11. ...the difference which must exist between the wedge angle and a right angle, and the purpose of which is to create the linear advances, has been given the name advance angle. Herdner, *Locomotives*, p. 195. Steering angle :

12. For city cars, cabs or omnibuses, it is important that the steering angle be very large so as to allow escape from a line of cars or to turn in narrow streets... L. Périsse, *Traité gén. des autom. à pétrole*, 1907, p. 339. e) BALISTICS

Angle of fall, angle of impact :

13. The angle of fall is the angle which the tangent to the curve at the point of fall makes with the horizontal. A. Ledieu, E. Cadiat, *Le Nouv. matériel naval*, t. 1, 1890, p. 16.

Angle of departure :

14. The angle of departure, (...), is the angle that the direction of the initial speed makes with the horizon. A. Ledieu, E. Cadiat, *Le Nouv. matériel naval*, t. 1, 1890, p. 16

Angle of rise. Angle formed by the line of fire and the line of site at the start of the shot. Angle of

sight. „It is the angle formed by the axis of the piece and the natural line of sight, i.e., taken flush with the metal, from the highest point of the breech plate to that of the bead.(Will. 1831). Blind spot. A portion of land that is in the open:

15. Below, in the forest, defiled by the dead angle of the hill, the musicians of the regiment, each for himself, repeated their part without concern for each other, ... Montherlant, *Le Songe*,1922, p. 56.

Pointing angle (in the navy). The distance between the extreme pointing limits of a piece :

16. The battleships of 1939 were either already old units, most of which had entered service between 1914 and 1922, or very recently built units, armed only since 1937. The former had almost all been modernized: the range of their main artillery had been increased by increasing the angle of aim of the guns, they had been equipped with a numerous flak; ... H. Le Masson, *La Marine*,1951, p. 15.

Angle of recoil :

17. The angle of recoil is the angle made with the horizontal by the straight line joining, in the plane of symmetry of the carriage, the axis of the trunnions to the point of support of the rear end of the carriage on the ground. Captain Alvin, *Leçons d'artillerie, Matériel*, 1908, p. 100. Bearing angle. Angle formed by the line of projection and the line of fire:

18. For the establishment of a firing table, one measures experimentally: the angle of bearing; the speed of the projectile at two points of its trajectory; ... A. Ledieu, E. Cadiat, *Le Nouv. matériel naval*,t. 1, 1890, p. 15.

Angle of elevation. For a given point, in relation to an observer, it is the angle that the line joining the observer to the chosen point forms with the horizontal plane (Uv.-Chapman 1956):

19. To point a gun, (...) one must, in short, give the angle of elevation (...), the elevation (...) and the direction. J. Paloque, *L'Artillerie de campagne*,1909, p. 170. Angle of fire :

20. Three guys at the box, three at the barrage ... They emptied their magazines, the guys, with a great skill, an amazing angle of fire, just above the head of the Romanians who were getting smaller, my friend!... R. Vercel, *Capitaine Conan*, 1934, pp. 99-100.

f) MAR. Angle of grip :

21. In the standard anchor (...) the setting angle is 115°. The angle formed by the plane of the legs with the line joining the beak to the center of the cicada's eye is called this. J. Galopin, *Cours de lang. mar, Matelotage et technol*, 1925, p. 111. g) OPTICS

Optical angle, - visual. Angle formed by two straight lines going from the center of the eye to the two extremities of an object (Privat-Foc. 1870):

22. Needs, interests, aptitudes, external reality, form a quadrilateral of references from which it is not easy to draw at each moment the adjusted component. Only those whose angle of vision is sufficiently open to embrace all of them together succeed. Mounier, *Traité du caractère*, 1946, p. 415. Angle of reflection. When a light ray is reflected on a surface S, the angle formed by the reflected ray and the normal to S at the point of incidence:

23. ...a light ray (...) can be: 1) reflected, if the medium is opaque, obeying the simple law that the angle of reflection is equal to the angle of incidence; ... N. and A. Metta, *Les Pierres précieuses*,1960, p. 26.

Angle of refraction. The angle formed by the refracted ray and the normal (Bouillet 1859):

24. ...light can only propagate in a single direction, and such that the sine of the angle of refraction is to that of incidence in the same ratio as the ripple lengths of the light in the two media. A. Fresnel, *Annales de chim. et de phys.*,t. 1, 1816, p. 279.

h) PHYS. Angle of torsion. Measure of the deformation undergone by a body under the effect of certain forces :

25. The influence of the nature of the wood, of its water content seems very important. In certain

cases, under the action of constraints of the order of the safety fatigue, one observes a significant creep. In torsion, the angle of torsion increases appreciably under constant torque then stabilizes after a certain time at a value which can be the double of the instantaneous angle of torsion, at the time of the application of the torque. J. Campredon, *Le Bois*, 1948, pp. 52-53.

i) TECHNOLOGY

Angle of action :

... the length of the mouldboard or, what amounts to the same thing, the angle of action of the mouldboard intervenes from the point of view of work execution. G. Passelègue, *Les Machines agricoles*, 1930, p. 18.

Angle of attack. Inclination in relation to the material to be attacked:

27. The theoretical study of the action of the coulter [of the plow] in the soil would lead to consider it as working like a knife and to establish it consequently with a very small angle of attack... G. Passelègue, *Les Machines agricoles*, 1930p. 10. Cutting angle. Inclination of the cutting part and path of a tool :

28. The chisel is a parallelepipedal steel rod, cut at an inclined angle of cut, which is pushed in front of one according to the desired arabesque, ... *Arts et litt. dans la société contemp.*, t. 1, 1935, p. 2814. Angle of clearance. The inclination of a lathe tool, a saw tooth, in relation to the material being shaped:

29. [The] (...) clearance face [of constant profile cutters] must be such that its sections through any diametral plane have the same profile and the same clearance angle... P. Gorgeu, *Machine Tools*, 1928, p. 160. Pressure angle :

30. The teeth of the rack are composed of portions of planes inclined along its length in two symmetrical directions and of an angle whose complement is called the pressure angle. P. Gorgeu, *Machine Tools*, 1928p. 25.

2. P. meton. A space so delimited or measured.

a) CIN, PHOT. Portion of space embraced by the lens; manner in which the camera is directed at the subject : 31. The limits of the portion of the scene to be retained are also called the angle or the field. G. Cohen, *Séat, Vocab. de filmologie*, p. 196. Angle of image, angle of shot (cf. G. Bounoure, *Regards neufs sur le cinéma*, 1953, p. 483); absol. angle : 32. The image angles were different according to each stage because the goal was to obtain the view of a battlefield in all its extent and under various angles. A. Kossowsky, *A. B. C. de la techn. du cin.*, 1934, p. 40.

b) FORTIF. A portion of land considered in relation to the arrangement of structures and from the standpoint of its exposure to blows. Angle of defense :

33. In a bastioned front, one distinguishes two salient angles, which are also called flanked angles, because they are defended by the flanks of the neighboring demi-bastions; two flanking or flanking angles, which are formed by the flanks and the curtain wall; two defense angles, which are formed by the flanks and the extension of the opposite faces, and a pincer angle, which is formed, in front of the middle of the curtain wall, by the extension of the faces. *Lar. 19e*, 1866. Reentrant angle, angle whose top is turned towards the interior of the fortification; - salient, - outgoing, angle whose top is turned towards the outside of the fortification :

34 ... this marabout crowns a fourth mamelon following the first three occupied by the city, at a small range of rifle of the rampart, at the level of the higher fortifications, and formed thus, to summarize, the fourth projecting angle of the same ridge, of which the tower of Serrin, the Dar-Sfah and the tower of Hallaff form successively the three others. Fromentin, *Un Été dans le Sahara*, 1857, p. 127. 35. Carthage could resist for a long time; its broad walls offered a series of inward and outward angles, an advantageous disposition for repelling assaults. Flaubert, *Salammbô*, t. 2,



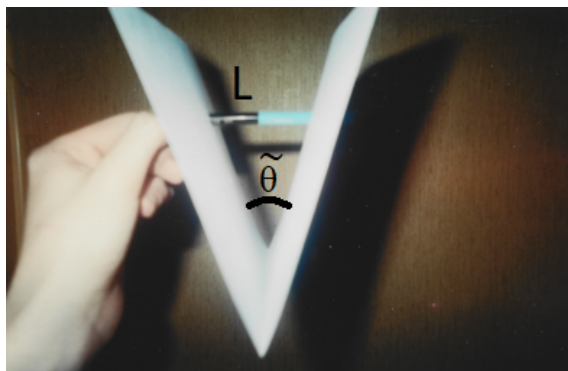


FIGURE 1A: Illustration of an angle as a length of a segment

1863, p. 73.

C.- SC. NATURAL 1. ANAT. Angular meeting of two surfaces. Angle of the hip :

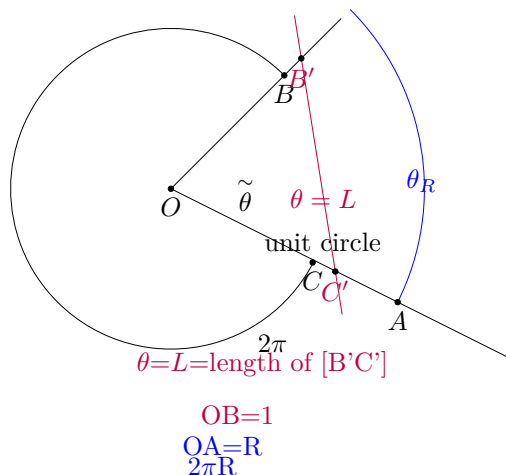
36. Because of its situation the angle of the hip is subject to various traumas which often cause its fracture. E. Garcin, *Guide vétérinaire*, 1944, p. 180. Louis' angle, sternal angle (cf. Garnier-Del. 1958):

37. ...an arch known as the angle or tubercle of Louis, which responds to the cartilage of union of the hilt and body... G. Gérard, *Manuel d'anat. hum.*, 1912, p. 109.

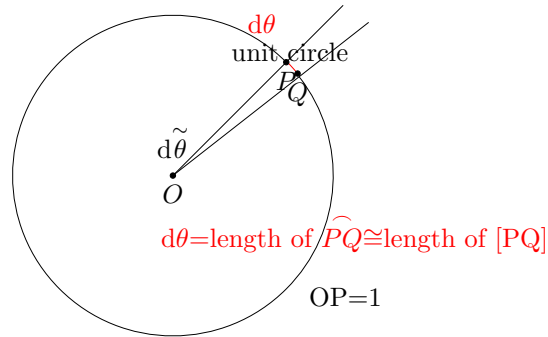
Angle of the eye, angle of the eyelids (cf. E. Garcin, *Guide vétérinaire*, 1944, p. 98): 38. It was on this day that we saw an erythematous plaque on the conjunctiva in the external angle of the left eye. A. Trousseau, *Clinique méd. de l'Hôtel-Dieu*, 1895, p. 222.

Angle of the scapula. „That of the three angles of this bone which is superior and internal. (Nysten 1814-20); (cf. Cadet de Gassicourt, *Traité chim. des maladies de l'enfance*, t. 1, 1880-84, p. 70).

Angle of the pubis. Angle formed by the junction of the two pubic bones, and whose apex is placed superiorly (Nysten 1814-20; G. Gérard, *Manuel d'anat. hum.*, 1912, p. 166).



$L$  is the length of the arc of a circle  $\widehat{BC}$  and also the length of the segment  $[B'C']$  which corresponds to the chord  $\widehat{BC}$  stretched to form a straight line. You can see illustration using a sheet of paper folded in two equal parts to form an angular opening  $\tilde{\theta}$  that becomes a bridge of length  $L$  between two points on the sheet (see FIGURE 1A). For a very small angle  $\theta$ , the points B and B' are practically coincident, the same for the points C and C' and thus the segment  $[B'C']$  and the arc  $\widehat{BC}$  are almost visually identical. For an infinitesimal angle  $d\theta$ , the points B and B' are coincident, likewise for C and C' so that the arc  $\widehat{BC}$  and the segment  $[B'C']$  are identical. In this particular case, the elementary angle can be likened to an infinitesimal length, which can itself be likened to a point.



We have exaggerated the angular spacing  $d\tilde{\theta}$  for didactic purposes as the Ummites suggest in their texts, it corresponds to the infinitesimal length  $PQ$  equal to  $d\theta$ . In the right-angled triangle  $OPQ$  right-angled at  $P$ , we apply the Pythagorean theorem  $OP^2 + PQ^2 = OQ^2$ , which gives  $OQ^2 = 1 + d\theta^2$ . In the same triangle  $OPQ$ , we obtain the relations (1),(2) and (3) linking  $d\theta$  and  $d\tilde{\theta}$  and we prove that the angle  $\tilde{\theta}$  is a length and that its square  $\tilde{\theta}^2$  is an area (equations (4),(5) and (6)):

$$\sin(d\tilde{\theta}) = \frac{d\theta}{\sqrt{1+d\theta^2}} \cong d\tilde{\theta} \text{ (neglecting the terms of order 3)} \tag{1}$$

$$\cos(d\tilde{\theta}) = \frac{1}{\sqrt{1+d\theta^2}} \cong 1 - \frac{d\theta^2}{2} \tag{2}$$

$$\tan(d\tilde{\theta}) = \frac{PQ}{OP} = d\theta \cong d\tilde{\theta} \text{ (neglecting the terms of order 3)} \tag{3}$$

$$\widehat{BC} = \int_0^\theta d\theta = \int_0^{\tilde{\theta}} d\tilde{\theta} = \tilde{\theta} = \theta = B'C' = L \text{ (unit circle)} \tag{4}$$

$$\widehat{BC} = \int_0^\theta R d\theta = \int_0^{\tilde{\theta}} R d\tilde{\theta} = R\tilde{\theta} = R\theta = RL \text{ (circle of radius R)} \tag{5}$$

$$\tilde{\theta}^2 = \theta^2 = \widehat{BC}^2 = B'C'^2 = L^2 \text{ (square in length } B'C') \tag{6}$$

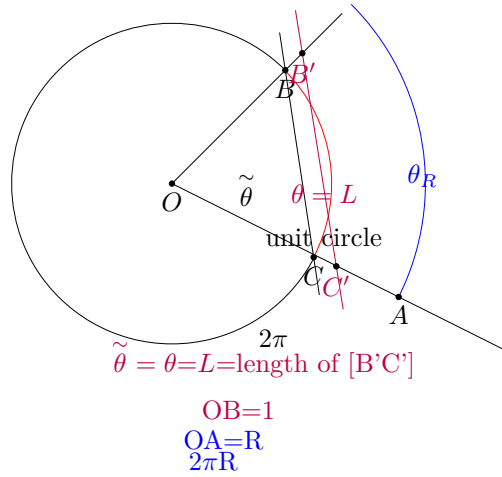
$$\text{Area of } \widehat{OBC} = \int_0^R \int_0^\theta r dr d\theta = \frac{R^2}{2} \theta \text{ (} \pi R^2 \text{ if } \theta = 2\pi) \tag{7}$$

$$[R] = \frac{[\widehat{BC}_R]}{[BC(R=1)]} = \text{dimensionless} \quad (8)$$

$$[\text{ANGLE}] = [d\tilde{\theta}] = [d\theta] = [\text{LENGTH}] \quad (9)$$

In the relation (7),  $R^2$  is dimensionless,  $\theta$  is a length equal to  $L$ ,  $1/2$  is also a length.

We neglect the cubed terms in the limited expansion of the tangent function near 0,  $\tan(x) = x + \frac{x^3}{3} + \frac{2x^5}{15} + \frac{17x^7}{315} + \dots \cong x$  (see relations (3) and (4)) and therefore, we have the relation (9) which completes the proof. For example, if  $d\tilde{\theta} = 10^{-12}$  radians,  $d\theta = 10^{-12}$  meters if you choose this unit of length ( $d\tilde{\theta}^3 = 10^{-36}$  is negligible compared to  $d\tilde{\theta} = 10^{-12}$ ).



In the isosceles triangle  $OB'C'$ , we apply Al Kashi's theorem  $B'C'^2 = OB'^2 + OC'^2 - 2OB' \cdot OC' \cos(\tilde{\theta})$  with  $OB' = OC'$  and  $\tilde{\theta} = \theta$  which is also written  $\theta^2 = 2(1 - \cos(\theta))OB'^2$  and with  $OB = OC = 1$ , we have the relations (10) and (11):

$$OB' = \frac{\theta}{\sqrt{2(1 - \cos(\theta))}} = OC' \quad (10)$$

$$BB' = \frac{\theta - \sqrt{2(1 - \cos(\theta))}}{\sqrt{2(1 - \cos(\theta))}} = CC' \quad (11)$$

We also have points  $B$  on the line  $(OB')$  and  $C$  on the line  $(OC')$  and we apply Thales' theorem in the triangle  $OB'C'$  which is written  $\frac{BC}{B'C'} = \frac{OB}{OB'} = \frac{OC}{OC'}$  which gives the relation (12):

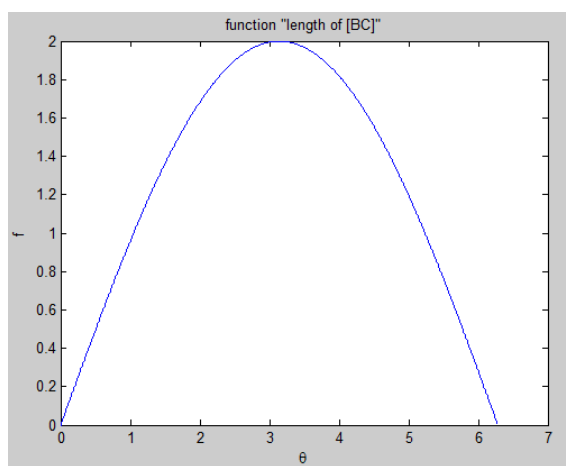
$$BC = \sqrt{2(1 - \cos(\theta))} \quad (12)$$

If we consider an infinitesimal angle  $d\theta$ , we neglect the terms of order 4 in the limited expansion of the cosine function near 0,  $\cos(x) = 1 - \frac{x^2}{2} + \frac{x^4}{24} - \frac{x^6}{720} + \dots \cong 1 - \frac{x^2}{2}$ , and by injecting into the relations (10), (11) and (12), we have  $OB' = OC' = \frac{\theta}{\sqrt{2(\frac{\theta^2}{2})}} = 1$ ,  $BC = \sqrt{2(\frac{\theta^2}{2})} = \theta = B'C'$  and  $BB' = CC' = 0$ ,

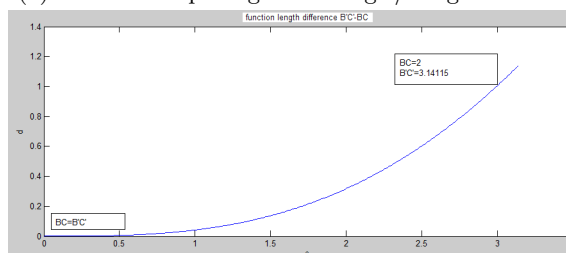
consequently for a very small angle, the lengths BC and B'C' are identical and the spacing of length BB'=CC' is zero. For a non-negligible angle, we can represent the opening of the angle by the function  $f : ANGLE/LENGTH \rightarrow LENGTH$  representing the length of segment BC, it vanishes at 0 and  $2\pi$  and passes through a  $\sqrt{4}=2$  maximum for  $\theta=\pi$  (see FIGURE 1B). The opening  $\tilde{\theta}=\theta=\pi$  is maximum and generates a maximum length equal to twice the radius of the circle. It should be noted that for this maximum aperture, B'C' is equal to  $\pi$  but also to an infinite length because a straight line connecting the two points B' and C' formed by a flat angle has an infinite length. This is why for the Ummite extraterrestrials, the geometric line does not exist. The difference in length B'C'-BC is given by the function :

$$d : ANGLE/LENGTH \rightarrow LENGTH$$

$$\theta \quad \mapsto \quad \theta - \sqrt{2(1 - \cos(\theta))}$$



(a) Function "Opening of the angle/Length of BC"



(b) Function "Difference in length B'C'-BC"

FIGURE 1B: Length of BC and difference B'C'-BC"

The international unit of measurement of angles is however the radian, defined as the ratio between the length of the intercepted arc  $L$  and the radius of the circle  $R$ . The definition of the angle as the ratio  $\theta = \frac{L}{R}$  is the biggest mistake of the terrestrial scientists and justifies the contempt of the extraterrestrial races that visit this planet for the Earth race, whether they are hostile or not

and whatever their degree of technological advance.

In geometry, length is the measure of a curve in a space on which a notion of distance is defined. The length is a linear measure on one dimension, as opposed to the surface which is a measure on two dimensions, and to the volume whose measure is on three dimensions. The length of a curve should not be confused with the distance between two points, which is generally smaller than the length of a curve connecting them, the shortest distance being that measured along a straight line. Length is a physical quantity and a spatial dimension. It is a fundamental unit in virtually every system of units. In particular, it is the unique fundamental dimension of the system of geometric units, which has the singularity of having no other fundamental unit. The measurement of length probably goes back to the early days of the Neolithic period and the associated sedentarization: if a civilization of hunter-gatherers can be satisfied with estimating its journeys in days of walking (thus, by a unit of time), the measurement of length becomes necessary as soon as it is a question of geometrically estimating rights to fields, or of discussing the selling price of a cloth. The first measures of length of which we find historical traces are linked to man, "measure of all things" : the cubit for measures of length (in particular of fabrics), the ten-foot pole for measures of surveying, the thousand of double steps (Roman mile) for measures of distance. These basic units obviously vary from one person to another, or from one population to another, and were eminently variable in time and space, although representing roughly the same quantities: the double step of an individual being roughly the value of his height, the Roman mile of 1,479 m supposes that the Roman soldier is barely 1.50 m tall... Moreover, these basic units could admit multiples or sub-multiples according to more or less conventional values: an inch is the twelfth of a foot and is the quarter of a palm of hand, etc. The fundamental notion is that of distance between two points, which can be measured directly by a ruler or a surveyor's chain. The next step in abstraction is to estimate the length of a curved line, which is done by imposing on a flexible but inextensible string the twists and turns of that curve, and then measuring the length of that string once it is stretched into a straight segment: this is how one measures a head turn. For the surveyor, the length of a path takes the form of a sum of elementary lengths, each section of path being sufficiently curved to be assimilated to a small segment of straight line. If the curvature of the path becomes too great, it is sufficient to take smaller segments to find a satisfactory approximation. This practice is the basis of the rectification of theoretical curves (circles, ellipses, etc.), aiming not at measuring but at calculating the length of an arc, of a curve called consequently rectifiable curve, in the form of a limit of the sum of an infinity of infinitely small segments. From the time of Archimedes, the Greeks knew how to calculate with a good approximation the perimeter of a circle, by the method of inscribed or exscribed polygons. The development of analytical geometry allowed to extend this approach to more and more complex curves. In classical geometry and physics, the notion of length is understood as something intrinsic to space, and independent of the observer. Even if non-Euclidean geometries had been known since the beginning of the 19th century, no one had imagined that physical space could be anything other than Euclidean space before the end of the 19th century. It was with special relativity that physics discovered that the measurement of a distance between two points or of the length of an object actually depended on the observer, and was therefore not an intrinsic measurement. However, even in general relativity, the space surrounding an observer is considered to be locally Euclidean. But even this familiar framework is challenged by quantum mechanics, where we see that for distances of the order of Planck's length ( $l_p=10^{-35}$ m), the measurement of a distance ceases to have any physical meaning, and the dimensions of time and space can no longer be easily distinguished in what appears to be a kind of undifferentiated quantum foam. By abuse of language, we also qualify as "length" the physical quantity which translates in a general way the

spatial extension of something, the quantity following a dimension of space. The spatial extension can however cover rather different cases, which are not all designated by the term "length":

The spatial extension between two points is specifically called the distance. It is the length of the line segment connecting these two points. Geometrically, the length of an object is a scalar generally measuring its spatial extension along the largest of its dimensions. It is generally its maximum diameter, which can be in any orientation; but if the object has natural axes, the "length" will be measured on the projection of one of these axes, and if the object has a natural direction of advance, the "length" will be taken with respect to this axis. Thus the "length" of a glider is often smaller than its wingspan. In the physics of the material point, the spatial extension of a displacement between two situations is expressed by the displacement vector of a point in space, which is referenced through a direction (dimensionless) and a distance (which has the dimension of a length). Similarly, the position of a point corresponds to the displacement that must be undergone to get from an origin to the point considered. In the mechanics of deformable bodies, each point is characterized by its own displacement relative to a reference situation. On these last two points, the derivative with respect to time will be called speed. On the first two points, we will rather talk about growth.

The term "length" is rather reserved for the geometric measurement of an object, a distance or a path. Such a length is then an extensive scalar (the overall length of a train is the sum of the lengths of its components). By definition, a length is an additive quantity: the length of a path is the sum of the lengths of its parts. Moreover, it is always a positive quantity. A "displacement" on the other hand is a vector quantity (characterized by a direction and a norm) and intensive (it is defined at each point, and cannot be added from one point to another). Along a curve, the elementary displacement  $\vec{dl}$  is an intensive quantity whose integral over the whole segment can lead to the length of the curve  $L = \int_A^B dl$  or to the displacement between its two ends  $\vec{AB} = \int_A^B \vec{dl}$ . In both cases, the integral is thus an extensive quantity (scalar or vector). But it is clear that, for example, on a closed curve, the "length" can measure the perimeter of a body, even though the "displacement" will necessarily be zero between the starting point and the ending point.

In analytical geometry, some curves can be defined by an equation. We can then calculate the length of an arc by computing an integral. The length is the physical measure of a distance. In the general case, the length of a path between a point O and a point T is the curvilinear integral of the elementary displacement vector of a point moving along this path between the two points. If the point P has coordinates  $(x(\tau), y(\tau), z(\tau))$  in an orthogonal frame of reference, the length of its trajectory will be defined by  $L(t) = \int_0^t \left\| \frac{\partial \vec{P}}{\partial \tau} \right\| d\tau = \int_0^t \sqrt{\frac{\partial x^2}{\partial \tau^2} + \frac{\partial y^2}{\partial \tau^2} + \frac{\partial z^2}{\partial \tau^2}} d\tau$ . It is possible to reparameterize the curve traveled by the point P as a function of the length  $l$  traveled:

$l = L(t)$  and  $P(t) = P(L(t)) = P(l)$ . With this setting, the partial derivative of the position of the point with respect to its curvilinear abscissa is a normalized vector, tangent to the curve, and the length of the trajectory is directly given by the curvilinear integral :  $\frac{\partial \vec{P}}{\partial l} dl = \vec{dl}$  and  $L(t) = \int_0^t \left\| \frac{\partial \vec{P}}{\partial l} \right\| dl = \int_0^t \frac{\partial \vec{P}}{\partial l} \vec{dl}$ .

With this setting, the partial derivative of the position of the point with respect to its curvilinear abscissa is a normalized vector, tangent to the curve, and the length of the trajectory is directly given by the curvilinear integral : The international unit for the measurement of length is the meter (abbreviated as m). In the International System of Units, it can also be expressed: in fractions of a meter: decimeter (dm), centimeter (cm), millimeter (mm), micrometer ( $\mu\text{m}$ ) ; or in multiples of meters: decameter (dam), hectometer (hm), kilometer (km). There are units of length outside the International System, in particular the inch, the foot and the mile.

In geometry, we frequently try to calculate the length of curves. For example, this is used to determine the dimensions of an object from the plane, so that it can be constructed. For example, to build a cylindrical tank, we need to know the length of the sheet metal that we will roll to form the shell (the central body). An "overall length" is taken in a straight line, along an axis of the object if there is one. The length of an object is the distance between its two farthest ends. When the object is threadlike or yaw-shaped, its length is that of the fully developed object. The length of an object allows us to appreciate its size. Length is a spatial dimension, which can be measured using units, such as those identified by the International System of Units: the meter and its multiples or submultiples. The length of a physical object is not an intrinsic property; it can depend on temperature, pressure, speed, etc. We give an example of length measurement. Let's measure a page of paper with a ruler made of 3 decimeters graduated in millimeters (mm); the page is 21 centimeters wide and 29.7 centimeters long.

We note in summary: width = 21 cm =  $21 \times 1 \text{ cm} = 21 \times 0.01 \times 1 \text{ m} = 0.21 \text{ m}$  and length =  $29.7 \text{ cm} = 29.7 \times 1 \text{ cm} = 29.7 \times 0.01 \times 1 \text{ m} = 0.297 \text{ m}$ . It is impossible to measure the thickness of the sheet with the same ruler. However, we can measure the thickness of a stack of 500 sheets (a ream) and find that  $500 \times \text{thickness} = 5 \text{ cm}$ . We can deduce that the thickness of a sheet is one tenth of a millimeter.

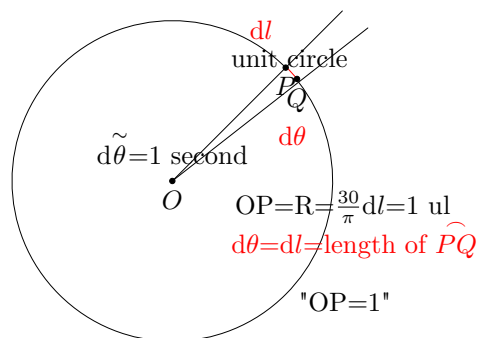
For small lengths - between 1 dm and 1  $\mu\text{m}$  - instruments such as calipers or "Palmer" micrometers are used. Below the micrometer - nanometer (nm), picometer (pm), femtometer (fm) -, we can no longer use sight to measure an object (diffraction problem, the wavelength of visible light being around 500 nm). It is then necessary to use other radiations, like an electron beam. Measurement of a length at the scale of civil engineering. We speak rather of "distance" between two points, to designate the measurement of the length of the line segment separating these two points. The "distance" between two points that are not too close or too far apart - between 1 mm and a few meters - is measured with a straight edge (a toise) that can be graduated. To measure an object, the two ends of the object are matched with points on the ruler. Of course, the object and the ruler must be rigid and undeformable. One can also use a string or a graduated tape (tape measure), which makes it possible to have an instrument easy to store and to transport; it is then necessary to make sure that the tape is well tended for the measurement, and its elasticity should not be too important. For large distances - between 1 m and a few km - optical phenomena are used, such as the difference in parallax or the scale created by the distance for a stadimetric rangefinder, or trigonometry, with the triangulation technique. We also use wave phenomena, typically the round trip time of a wave: sound wave for a sonar, light wave for a laser rangefinder, radio wave for a radar. In seismology, we use the difference in propagation speed of P and S waves to determine the distance to the hypocenter of an earthquake. The measurement of distances in astronomy is done by measuring the time it takes light or more generally electromagnetic waves to travel the straight line between two objects, or the phenomenon of red shift. We use units such as : the astronomical unit (au), equal to the distance from the Earth to the Sun is about 8 light-minutes, or, given the speed of light, about 150 million km ; the light-year (ly), the distance covered by the light during one year, that is to say approximately 10 000 billion kilometers; the parsec (pc), which is the distance from which the Sun-Earth distance appears as an arc of one second; one parsec is worth about 3.26 ly.

Length can, in some situations, represent duration, as in the length of days, or in the expression "all day long" which means during the whole day, or in "to drag on for a long time" which means to last too long. For example, in the international system of measurement, 1 meter (dl) corresponds to 1 second (d $\theta$ ) which corresponds on a clock to an angular opening equal to  $\frac{\pi}{30}$  radians, or

approximately 0.10471 radians. Consequently, 1 meter corresponds to an angular opening of on a circle of equal radius  $R = \frac{30}{\pi}$  meters or approximately 9.5492 meters ( $R$  is here a factor of scale corresponding to the choice of the unit) and as we saw previously that 1 radian corresponds to a unit of length (ul), the unit of length considered on the unit circle is 1 unit of length =  $\frac{30}{\pi} \approx 9.5492$  meters. One can choose the scale factor  $R$  as large as one wants to realize that even a gigantic length in this unit of length corresponds to a small angle. It is quite also possible to make correspond 1 ly with 1 second on a circle unit whose radius  $R$  is equal to  $\frac{30}{\pi} \approx 9.5492$  ly (1 unit of length/ 1 ul). We can start again the same reasoning with any unit of measurement. With the approximation of the number  $\pi \approx 355/113$  we have  $30/\pi \approx 678/71$  and if we consider that the arc of circle  $dl$  is equal to the distance traveled during 1 second by a photon of light in the vacuum, that is to say  $dl = 2.99792458 \cdot 10^8$  m, we obtain a unit circle of radius  $R = 28.6280 \cdot 10^8$  m. This distance corresponds to an angular opening of 1 radian and we have that  $d\tilde{\theta} = d\theta = dl \approx \frac{71}{678} R$ .

The cyclic time interval "second" is replaced by the distance "second light" and  $71/678$  is the angular fraction of the circle's circumference expressed in radians corresponding to 1 second.

Conclusion: An angle and a length are in fact one and the same quantity and the choice of the unit of length corresponding to an angular radian is free. A length is expressed in radians. This quantity can correspond to a cyclic duration (for example the second), that is to say which repeats itself in the measurement of time since the origin of the universe for all civilizations since the BIG BANG or the birth of Christ for the human history of the Earth.





In chemistry, tetravalence is the state of an atom with four electrons available to form covalent chemical bonds in its valence shell (outer electron shell). For example the carbon atom is said to be tetravalent because it can establish up to four different single bonds with other atoms or establish, as in the case of alkenes, two single bonds and one double bond, or as in the case of alkynes, one single bond and one triple bond.

Tetravalence of carbon

Carbon, with the atomic symbol C, is the atom that holds the main place in the world of molecular structure of living organisms. With four bonds, its tetravalence gives it a fundamental property: to be the basis of a stable molecular skeleton.

Carbon as a pure body exists in nature in two forms: diamond and graphite (coal). The derivatives composed of carbon are very numerous: we count today 15 million of them. The characteristics of carbon are an atomic number  $Z=6$  and an average molar mass of :  $M(C)=12$  g/mol.

Graphite carbon, i.e. coal, is the most common form of pure carbon. It is used as a fuel. The combustion reaction transforms carbon into carbon dioxide with the help of oxygen from the air, with a strong release of energy. Carbon graphite has a well-known crystallographic structure: it is a hexagonal assembly. The particularity of the assembly is that it is lamellar. There is indeed a distance of 335 pm between each sheet, while for comparison, the side of each hexagon measures 141.5 pm. This lamellar structure allows the insertion of molecules or ions: the insertion compounds. Graphite also exists in rhombohedral form. The binding energy between carbon atoms in graphite is of the order of that of benzene, about 310 kJ/mol. Graphite is black because of the large delocalization of electrons in the network implies a total absorption. The carbon atom can bond with other carbon atoms to form, for example, diamond. The hardness of diamond is the consequence of two facts: a great cohesion and a very high energy of connection between carbon atoms:  $E(C-C)_{\text{diamond}}=360$  kJ/mol. Diamond is a face-centered cubic structure, where each carbon of the mesh is surrounded by four carbon atoms in a tetrahedron. The fullerenes are structures all intermediate between the diamond carbon and the graphite carbon. They are in the form of spheres (composed only of carbon) differing by the number of carbon atoms that compose them, for example  $C_{60}$  (footbalene),  $C_{40}$ ,  $C_{120}$ ... Many researches are currently conducted to find industrial applications for them. Given its excessively high price, and even its success with the woman it loves, it is hard to believe that an impressive skull and crossbones should be printed in the carbon box of the periodic table of elements. Carbon can also bond with other carbon atoms to form graphite in pencil lead as we have just seen.

In its ground state, carbon has only two single electrons. Its tetravalence is explained by the fact that carbon redistributes two electrons on its L layer, allowing four bonding electrons. Moving an electron to a higher electron orbital is called the excitation of an atom. In the Mendeleiev classification, carbon is on the second row, in the sixth column, and has the atomic number  $Z=6$ . The electronic configuration of carbon is therefore  $K^2L^4$  or  $1s^22s^22p^2$ . This implies that four unpaired electrons can create bonds: carbon is tetravalent. Methane ( $CH_4$ ) is archetypal of the compounds formed by carbon: the tetravalent carbon atom forms four single covalent bonds with four hydrogen atoms. Nature has chosen carbon for the constitution of plant and animal living beings, so the formula of methane  $CH_4$  indicates that the tetravalence of carbon is indeed the divine will. All living things on Earth are carbon-based. The carbon atom is said to be tetravalent because it can make up to four different single bonds with other atoms or make, as in the case of alkenes, two single bonds and one double bond, or as in the case of alkynes, one single bond and one triple bond. In tetragonal carbon, the four bonds of carbon can be oriented in four different directions. The angle between each bond is  $109^\circ 28'$ . This tetrahedral structure is found in molecules

such as alkanes, cyclanes, as well as in alkyl groups.

Tetravalence of silicon

Silicon is also tetravalent in most of its compounds, for example silane (SiH<sub>4</sub>) which like methane is a potentially explosive gas in the presence of oxygen. Thus, one could consider a silicon-based organic chemistry by analogy, but silicon does not form stable  $\pi$ -bonds, making silicon chemistry poorer than carbon chemistry.

Furthermore, there has been a theory about the possibility of silicon-based life. One limitation, however, is that using the biochemical reactions of carbon compounds as a model, the byproducts of a silicon-based life would be solid and would pose disposal problems. Furthermore, products such as silane or silicon, signs of a silicon biology, have never been observed by astronomers in exogenous planets or meteorites. Because of its  $1s^2 2s^2 2p^6 3s^2 3p^2 3d^0$  electronic structure, silicon is located just below carbon in the periodic table. It is normally tetravalent, but the specificity of silicon leads to important differences between organosilicon and organic chemistry. Thus: - Silicon is significantly bulkier than carbon (atomic radii in nanometers [nm]: C, 0.091; Si, 0.132), which results in bonds involving silicon being comparatively longer than those involving carbon. Examples [nm]: C-H, 0.109; Si-H, 0.148; C-C, 0.154; C-Si, 0.189; Si-Si, 0.234; C-O, 0.141; Si-O, 0.163, where values may vary slightly with the nature of the products considered. As a result, the  $\pi$ -overlap is low and, while the sp<sup>2</sup> or sp hybridization state is common in carbon chemistry, derivatives possessing triply bonded silicon do not exist, and doubly bonded silicon compounds, stable at room temperature, are very few and require protection of the double bond by bulky groups. There are some compounds with double bond Si=C, Si=N, Si=Si, Si=P... but no double bond Si=O.

In medicine, a tetravalent vaccine is one that covers a preventive range of four diseases. Such as Tetravac (Sanofi Pasteur M.S.D.) for polio, diphtheria, tetanus and pertussis or the measles, mumps, rubella and varicella vaccine.

In the social sciences, tetravalence is the state of what is and what is not, at the same time. This definition makes it possible to bypass Manichean concepts in order to allow the coexistence of several states, realities or cultures. The confrontation of two antagonistic theses can lead, through the notion of tetravalence, to consider a complementarity between them. Tetravalence designates a state based on a multiple truth value. Tetravalence is a human application of a natural phenomenon or an application of nexialism.

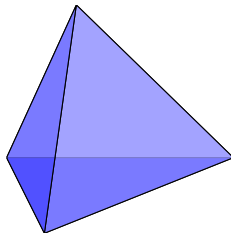
This social definition of tetravalence, and its less and less anecdotal use, could come from the reflections in fundamental physics induced by the Umno case. As the angles are defined modulo  $2\pi$ , a zero angle equal to 0 radians, and an angle equal to  $2\pi$  radians are found on the same point of the trigonometric circle. So an angle can be zero and non-zero, two antinomic states can coincide, in geometry overlap exactly.

In geometry, tetrahedrons (from the Greek tetra: four) are polyhedrons of the pyramid family, composed of 4 triangular faces, 6 edges and 4 vertices. We can associate these 4 vertices to the four values of the tetravalent logic.

The 3-simplex is the abstract representation of the tetrahedron; in this model, the edges are identified with the 6 2-element subsets of the set of four vertices, and the faces with the 4 3-element subsets.

Each vertex of a tetrahedron is connected to all others by an edge, and similarly each face is connected to all others by an edge. These characteristics are rare: only two polyhedra with the first property have been discovered: the tetrahedron and the Császár polyhedron, which has 7 vertices of order 6, 14 triangular faces, and 21 edges; similarly, only two polyhedra possessing the second property have been discovered, the tetrahedron and the Szilassi polyhedron, which has 14 vertices,

7 hexagonal faces, and 21 edges; the Császár and Szilassi polyhedra are dual and are homeomorphic to the torus. The 1-skeleton of a tetrahedron - the set of its vertices connected by its edges - forms a complete graph called a tetrahedral graph and denoted  $K_4$ .



Many remarkable points of the triangle have analogues for the tetrahedron, with the notable exception of the orthocenter. This is in particular the case for the center of the circumscribed sphere (intersection of the median planes of the edges), the centers of the inscribed and exinscribed spheres (intersections of the bisector planes), or the center of gravity. A tetrahedron is said to be "orthocentric" when its four heights are concurrent; the point of concurrence is then the orthocenter of the tetrahedron. A generalization of the orthocenter, which coincides with it for orthocentric tetrahedra but which is always defined, is the Monge point, intersection of the planes orthogonal to an edge and passing through the middle of the opposite edge. Given the 6 lengths of the edges, the tetrahedron can be constructed if and only if these lengths (strictly) verify the triangular inequality. If one specifies the order of the edges, there are (except for isometry) only two solutions, mirror images of each other; a concrete realization (using rigid bars, for example) is necessarily without any degree of freedom, and therefore non-deformable.

In addition to the 12 angles of the four faces (computable by the classical trigonometry formulas of the triangle), there are 6 dihedral angles corresponding to the six edges, and 4 solid angles corresponding to the four vertices. Noting  $(P_1, P_2, P_3, P_4)$  the four vertices of a tetrahedron, we will note  $\theta_{ij}$  the dihedral angle between the two faces adjacent to the edge  $(P_i P_j)$ ,  $\Omega_i$  the solid angle at  $P_i$ , and  $\delta_i$  the area of the face opposite the vertex  $P_i$ .

The Ummites tell us that we can only progress in our conception of the universe by creating a new logic with four truth values in which the principle of the excluded third does not apply. The truth values of this logic are :

- AIOOYAA (TRUTH)
- AIOOYEEDOO (FALSE)
- AIOOYA AMMIE (can be translated: TRUE OUTSIDE THE WAAM)
- AIOOYAU (untranslatable in Earth language).

NB: we will call "universe" the whole of the pairs of cosmos, i.e. the whole of Creation, and "cosmos" one of the members of a pair. We live in one of its cosmos, which has its twin cosmos. Other pairs exist.

The subject is extremely difficult not technically but "mentally", it requires to get rid of all the "prejudices" we could have on things as "natural" as the notions of truth/falsehood or integer. This

requires mental gymnastics and an open mind. I have been thinking about these topics myself for some time and I have seen how difficult it is. My starting points are the Umno D59 document and my own readings in logic, in particular the work of M.Delahaye.

Our work tries to reconstruct arithmetic from a set of axioms for a set theory in which an empty set would not be allowed. We thus try to overcome Gödel's incompleteness theorem. It seems to me that this is too strict an interpretation of the ummite texts which do not specify that the empty set does not exist (but only that the "axes" (oawoo) of the UIs have no origin), and have never said (unless I am mistaken ;-)) that their tetravalent system allows to get rid of incompleteness, but on the other hand they affirm that it is necessary to describe the WAAM.

Note: in the following, SF means "formal system". We plan to describe later what it means in detail. For now, we will assume that you, my reader friend, are aware of what a SF is. If not, let's say that it is a set of axioms and rules. These rules allow to obtain in a purely formal (syntactic) way "theorems" which are made according to the rules of SF from axioms and other theorems. A particularly important example of SF is that of usual arithmetic, another is the so-called "ZF" system (for Zermelo-Fraenkel) of set theory.

We would propose:

AIOOYAA = true in the considered SF (the one that creates the waam)

AIOOYEEDOO = false in the considered SF

AIOOYA AMMIE = true outside the SF, e.g. Gödel's undecidables are true even though they are not provable in the SF (neither true nor false because no SF or meta SF can give the truth value). Are there other classes of AIOOYA AMMIE propositions?

AIOOYAU = indeterminable (Quantum superposition is a fundamental - but perfectly counter-intuitive to the human mind - feature of particles smaller than the atom that allows them to be simultaneously in different states). Remembering the ummite sentence "you have to abandon the axiom of the excluded third" : how to do it without that the propositions both true and false contaminate the whole system ? In fact a proposition simultaneously AIOOYAA and AIOOYEEDOO may be AIOOYAU?

Note: in document D33, it is said in black and white:

AIOOYA OEMII: MAN EXISTS.

AIOOYA AMMIE WOA : GOD EXISTS.

AIOOYA AMMIE EUUAWA : THE SOUL EXISTS.

Let us note the term AIOOYA AMMIE for God and the soul : they exist "outside the waam", they are true but undecidable propositions.

Some terrestrial logicians have already expressed tetravalent logical systems : for example the "Russelian" system of Barwise and Etchemedy analyzed in the remarkable book of Delahaye, "information, complexité et hasard" published by Hermès éditions : in this system we consider that it is necessary to differentiate sentences and propositions, only propositions have a logical value. Moreover we consider a relative notion of truth, we suppose that there is a set of "states of affairs"

which constitutes the universe; this set of states of affairs contains among others sentences and propositions and the propositions that a SF can make are relative to a given state of affairs (that Barwise calls a model, but I don't like this term because it is confused with the theory of models and this is distinct). More precisely we distinguish between:

- true (theorem of SF)
- false (theorem of the SF affirming the falsehood)
- made true (there exists in the model (the world) a sentence affirming the truth of the proposition)
- made false (= not made true).

For example the liar's proposition : 'this proposition is false' is then made false by any model but is not false in any model. The liar's proposition cannot be made true (it is therefore made false), but this falsity cannot be internalized: the liar's falsity is not an authentic fact of the world.

This is interesting because we can then define the WAMM as 'the set of propositions made true'. The universe then emerges from the logic, which seems to me to be the objective.

In terms of arithmetic, you have to know that Peano's arithmetic is only one of the possible arithmetic and that other formulations already exist:

For example the system of Von Neumann, where we build the integers from the empty set : we note nil the empty set and a,b the set containing the two elements a and b , we note  $\cup$  the symbol of the set union :

Then by definition according to Von Neumann :

$$0 = \text{nil}$$

$$1 = 0 \cup 0 = \{\text{nil}, \{\text{nil}\}\}$$

$$2 = 1 \cup 1 = \{ \{\text{nil}, \{\text{nil}\}\}, \{\text{nil}, \{\text{nil}\}\} \}$$

$$3 = 2 \cup 2 \text{ etc.}$$

All the integers are thus sets built from the void. Contrary to Peano, 0 is asserted to be different from 1 ; moreover these integers have the troubling property : for any n and for any x, if x is element of n, then x is included in n. Taking the set of all Von Neumann integers (their denumerable union), we then have an infinite omega set (it cannot be put in bijective correspondence with any integer). We then define  $\omega+1 = \omega \cup \{\omega\}$ ,  $\omega+2 = \omega+1 \cup \{\omega+1\}$  etc... We thus obtain the theory of ordinals. (Let's recall in passing that there is no recursive (computable) naming rule for ordinals).

Any CONSTRUCTIBLE mathematical object is an element of an ordinal...

By the way, Martin Gardner said about the empty set: "if there is no set containing no element, then their set (the set of sets containing no element) is empty and therefore the empty set exists!" This quip may be deeper than it seems...

Besides the Von Neumann integers, we have also the more recent theory of J.Conway, the "surreal" numbers : this time J.Conway doesn't create the integers with the help of the empty set, but with the help of hyper sets. To create the latter we take the set theory of ZF (Zermelo-Fraenkel) and we replace the axiom of foundation "no set can contain itself" by the axiom of anti-foundation : "sets can contain themselves". In particular there is a set omega (again! the letter omega seems to fascinate logicians) such that  $\omega = \omega$ . The theory of hyper sets is very promising, it is not without links with game theory...

Let's mention that we can build Conway integers in lisp, a language we love:

$$0 = \text{nil}$$

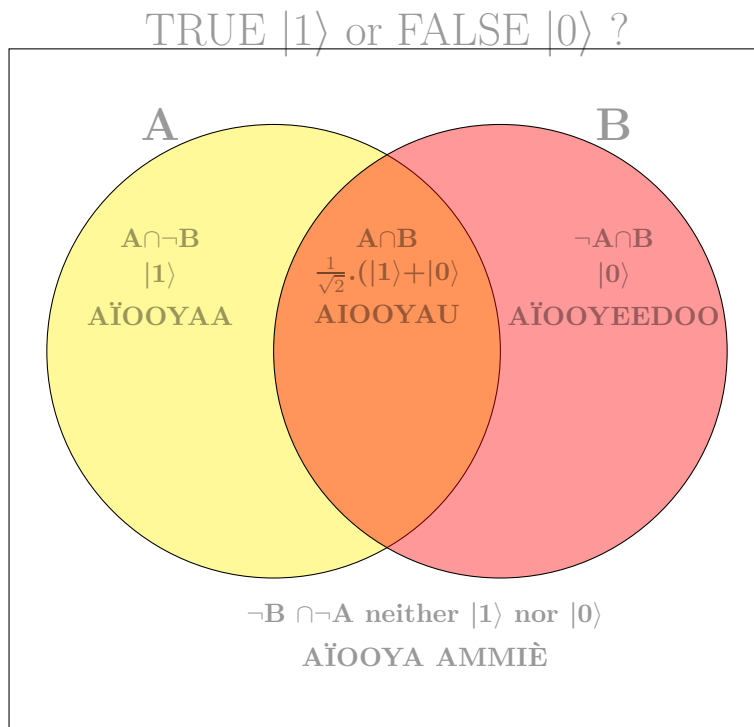
$$1 = \text{cons}(\text{nil}, \text{nil})$$

$$2 = \text{cons}(\text{nil}, 1) = \text{cons}(\text{nil}, \text{cons}(\text{nil}, \text{nil}))$$

$$3 = \text{cons}(\text{nil}, 2) \text{ etc..}$$

A real between 0 and 0.9999999999999999... is written 0.0000000 ...an integer at the end, and any integer greater than 1 can be written  $1+1+1+1+\dots$  a finite number of times, which can be very large if the integer is very large. Now  $1=\text{cons}(\text{nil},\text{nil})$ ,  $2=\text{cons}(\text{nil},1)=\text{cons}(\text{nil},\text{cons}(\text{nil},\text{nil}))$ , ect... so the elementary brick of any integer greater than 1 is  $0=\text{nil}$ , similarly the elementary brick of any real number included in the interval  $[0,1[$  is also  $0=\text{nil}$ .

If we consider two states TRUE and FALSE, represents the superposition of these two states (indeterminate) i.e. the propositions which are TRUE and FALSE at the same time whereas the case neither TRUE NOR FALSE represents the undecidable propositions in the sense of Godel's theorem, which are TRUE outside the WAAM. If we consider two states  $|1\rangle$  (TRUE) and  $|0\rangle$  (FALSE),  $\frac{1}{\sqrt{2}}\cdot(|0\rangle+|1\rangle)$  represents the superposition of these two states (indeterminate) i.e. the propositions which are TRUE and FALSE at the same time whereas the case "neither TRUE nor FALSE" represents the undecidable propositions in the sense of Gödel's theorem, which are TRUE outside the WAAM.



The set  $A \setminus (A \cap B)$  corresponds to the quantum state  $|1\rangle$ , i.e. all the TRUE and not FALSE assertions, in Ummite language: AĬOOYAA. The set  $B \setminus (A \cap B)$  corresponds to the quantum state  $|0\rangle$ , i.e. all the FALSE and not TRUE assertions, in Ummite language: AĬOOYEEDOO. The set  $A \cap B$  corresponds to the superposition of the two states  $|1\rangle$  and  $|0\rangle$  i.e. all statements that are TRUE and FALSE at the same time, in Ummite language: AĬOOYAU. The  $X \setminus (A \cup B)$  corresponds to the state neither  $|1\rangle$  nor  $|0\rangle$  i.e. the set of propositions that are undecidable via Gödel's incompleteness theorem, these are the assertions that are neither TRUE nor FALSE, in Ummite language: AĬOOYA AMMIÈ.

We can translate these four states of tetravalent logic in terms of binary equalities and inequalities.

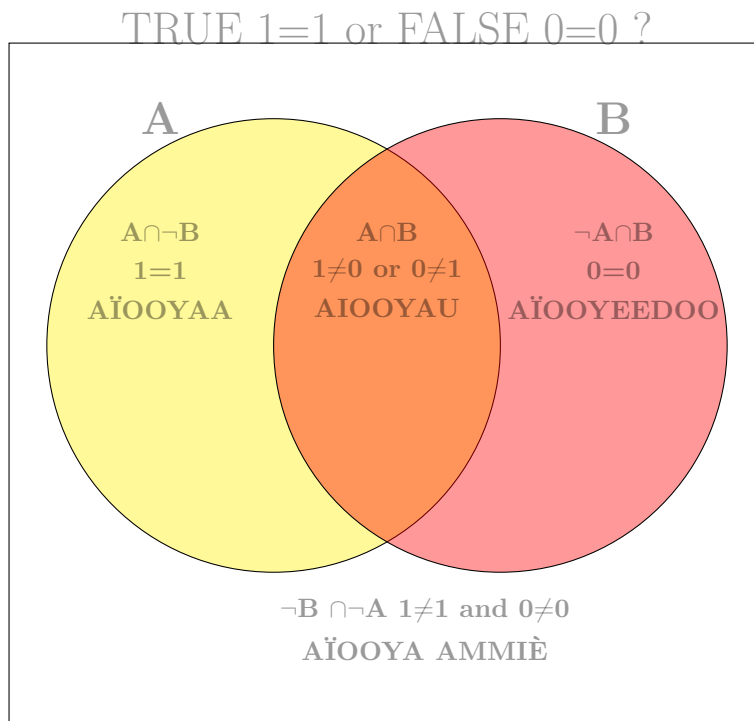
The state  $|1\rangle$  is duplicated in a couple  $(|1\rangle,|1\rangle)$ , we make a copy of the state  $|1\rangle$ , which gives the binary couple  $(1,1)$  which is exactly the binary equality  $1=1$ .

The state  $|0\rangle$  is duplicated in a couple  $(|0\rangle,|0\rangle)$ , we make a copy of the state  $|0\rangle$ , which gives the binary couple  $(0,0)$  which is exactly the binary equality  $0=0$ .

The state  $\frac{1}{\sqrt{2}}(|1\rangle+|0\rangle)$  corresponds to the entanglement of the two quantum states which gives the two intricate binary inequalities  $1\neq 0$  and  $0\neq 1$ .

The state neither  $|1\rangle$  nor  $|0\rangle$  corresponds to the negation of the set  $A\cup B$  which gives  $(A\cup B)^c = \{(1=1) \text{ or } (0=0)\}^c = \{(1\neq 1) \text{ and } (0\neq 0)\}$  which leads to the disjointed binary inequalities  $1\neq 1$  and  $0\neq 0$ . This corresponds to undecidable statements in Peano's arithmetic and in set theory (Gödel). In Ummite language, we say that these propositions are TRUE outside the WAAM, in another UNIVERSE.

The attached Venn diagram represents the binary inequalities with tetravalent logic, in orange color for the intricate inequalities and in white color for the disjoint inequalities.



Since the concept of negation is meaningless in tetravalent logic, the negation operator is replaced by the complement operator, which is noted by the sign "¬".

Law of closure:

For any set p there exists a unique set  $\neg p$  called the complement of p.  $\neg p$  is the set which includes all the elements of TFBN except those of p.

Law of involution:

$\neg(\neg p)$  is identically equal to p.

p is the complement of  $\neg p$  just as  $\neg p$  is the complement of p.

The set p and its complement  $\neg p$  are disjoint (i.e. they have no elements in common).

TRUE and FALSE in tetravalent logic:

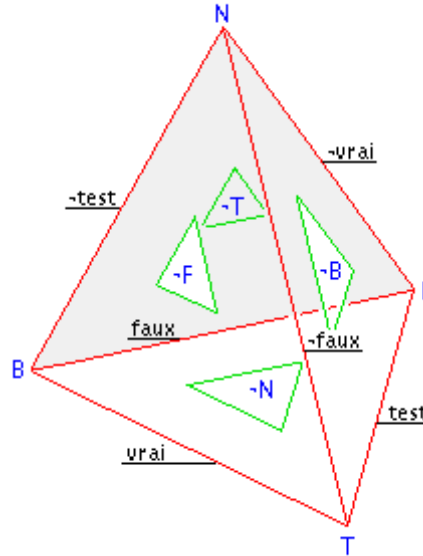


FIGURE 1C: Tetrahedron TFBN representing the symmetry of the tetravalent logic

$\text{TRUE} = (\text{T or B}) = \text{TB}$   
 $\text{FALSE} = (\text{F or B}) = \text{FB}$   
 $\neg\text{TRUE} = (\text{F or N}) = \text{FN}$   
 $\neg\text{FALSE} = (\text{T or N}) = \text{TN}$   
 $(\text{TRUE and FALSE}) = (\text{TB and FB}) = \text{B}$   
 $(\text{TRUE and } \neg\text{FALSE}) = (\text{TB and TN}) = \text{T}$   
 $(\neg\text{TRUE and FALSE}) = (\text{FN and TB}) = \text{F}$   
 $(\neg\text{TRUE and } \neg\text{FALSE}) = (\text{FN and TN}) = \text{N}$   
 (see FIGURE 1C)

If  $p=\text{TFBN}$ ,  $\neg p$  the empty set.

If  $p=\text{T}$ ,  $\neg p=(\text{F ou B ou N})$ .

If  $p=\text{F}$ ,  $\neg p=\text{TBN}=(\text{T ou B ou N})$ .

If  $p=\text{B}$ ,  $\neg p=\text{TFN}=(\text{T ou F ou N})$ .

If  $p=\text{TRUE}=\text{TB}$ ,  $\neg p=\text{FN}=(\text{F ou N})$ .

If  $p=\text{FALSE}=\text{FB}$ ,  $\neg p=\text{TN}=(\text{T ou N})$ .

If  $p=\text{test}=\text{TF}$ ,  $\neg p=\text{BN}=(\text{B ou N})$ .

Since the empty set  $\{\}$  is the complement of the logical universe TFBN, it is disjoint from it; it is therefore clear that the empty set  $\{\}$  cannot be part of any subset of the logical universe TFBN. In practice  $\{\}$  is the set of all assertions without any logical value, i.e.: of all illogical assertions.

We can represent the subsets of TFBN in the form of this tetrahedron, which allows to visualize the symmetry relations due to the complement operator.



The volume of the tetrahedron represents the logical universe:

TFBN = (T or F or B or N)

The 4 vertices represent the 4 singletons: T F B N

The 6 edges represent the 6 pairs of values:

TRUE=TB=(T or B) FALSE=FB=(F or B) test=TF=(T or F) ¬TRUE=FN=(F or N)

¬FALSE=TN=(T or N) ¬test=BN=(B or N)

The 4 faces represent the 4 triplets of values:

¬T=FBN=(F or B or N) ¬F=TBN=(T or B or N) ¬B=TFN=(T or F or N) ¬N=TFB=(T or F or B).

The empty set {} is not represented (see FIGURE 1C).

We see that each subset of TFBN is located exactly opposite its complement in the tetrahedron.

We also see that the usual binary logic corresponds only to the two vertices T and F of the tetrahedron, the two vertices N (the neither true-nor false assertions) and B (the true-and-false assertions, i.e.: potential or partially indeterminate) being confused with the vertex F (the false assertions). Even worse, the usual binary logic also confuses the empty set (the assertions without logical value) with the vertex F (the false assertions). The loss of information when we reduce the whole logic to the usual binary logic is thus enormous.

When a carbon atom forms four bonds with four different atoms, it is tetragonal. These bonds are simple bonds. Example: the methane molecule. The carbon atom forms four single bonds with four hydrogen atoms. In geometry, the regular tetrahedron is a tetrahedron whose 4 faces are equilateral triangles. It has 6 edges and 4 vertices. It is one of the five Platonic solids. It has a circumscribed sphere passing through its 4 vertices and an inscribed sphere tangent to its 4 faces. As it has 3 vertices per face, and 3 faces per vertex, its Schläfli symbol is {3,3}. If  $a$  is the length of an edge: its height is equal to  $H = \sqrt{\frac{2}{3}}a$ , its center is located, with respect to the base, at:

$h = \frac{H}{4} = \frac{a}{2\sqrt{6}}$ , the radius of its circumscribed sphere is  $R = \frac{3}{4}H = \sqrt{\frac{3}{8}}a$ , the radius of its inscribed sphere is  $r = \frac{1}{3}R = \frac{a}{\sqrt{24}}$ , its area is  $A = \sqrt{3}a^2$ , its volume is  $V = \frac{a^3}{6\sqrt{2}}$ , its dihedral angle is  $\text{Arccos}(\frac{1}{3}) \simeq 70.5288^\circ$ , its central angle (i.e. the one formed, two by two, by the four segments which start from the center towards the four vertices) is  $\text{Arccos}(\frac{-1}{3}) \simeq 109.471^\circ$ , the solid angle of a face seen from the opposite vertex is  $\text{Arccos}(\frac{23}{27}) \simeq 0.55129$  steradians. These three fixed angles characterize the regular tetrahedron, so we speak of angular tetravalence, tetravalence means valence 4. The valence of a chemical element is the maximum number of covalent or ionic bonds it can form according to its electronic configuration. In a molecule or an ion, the valence of an atom is the number of covalent bonds that this atom has formed. In a monoatomic ion, its valence is its charge, which is referred to as electrovalence. A univalent element is thus an element that will form molecules by forming a single covalent bond or monocharged ions; on the other hand, bivalent, trivalent or tetravalent elements will associate respectively with two, three or four atoms of a univalent element to form molecules, as in methane (CH<sub>4</sub>) where carbon, with a quadruple valence, is linked to four hydrogen atoms. The valence layer is the last electronic layer (or outer layer) of an atom and the sub-layer(s) being filled.

The three angles that characterize tetravalence are:

1. the dihedral angle

In geometry, the angle between two planes is called the dihedral angle. The dihedral angle of a regular tetrahedron is the angle observed on the ground, in a plane perpendicular to one of

the edges on the ground, that the base of the tetrahedron and a face make. Face whose base is, on the ground, "seen from the end" (i.e. one point for one edge).

The dihedral angle of two planes can be measured on the "edges" of the planes, i.e. along their line of intersection.

The dihedral angle  $\phi_{AB}$  between two planes denoted A and B is the angle between their two normal vectors  $n_A$  and  $n_B$ :  $\cos \phi_{AB} = n_A \cdot n_B$ .

A dihedral angle can be signed; for example, the dihedral angle can be defined as the angle of rotation (along their line of intersection) that would allow plane A to overlap plane B. Thus, . In particular, it is sufficient to specify this angle or its supplementary angle.

## 2. the central angle

The characteristics of the regular tetrahedron are as follows: Two edges with a common end form an angle of  $60^\circ$ . The four faces are isometric equilateral triangles. Adjacent faces form angles of  $60^\circ$ . This corresponds to a central angle of  $109.471^\circ$ .

## 3. the solid angle

The sum of the solid angles of a regular tetrahedron is  $12 \cdot \text{Arcos}(\frac{1}{3}) - 4\pi = 2.2051042394\dots$

The 4 points with coordinates  $(1,1,1), (1,-1,-1), (-1,1,-1), (-1,-1,1)$  are the vertices of a regular tetrahedron with edge  $a=2\sqrt{2}$  centered at the origin, derived from four vertices of a cube. The isometries leaving globally invariant the regular tetrahedron form a group isomorphic to the symmetric group  $S_4$ . The subgroup of positive isometries is isomorphic to the alternating group  $A_4$ . The regular tetrahedron is its own dual, i.e. by joining the centers of its faces, we obtain a similar regular tetrahedron.

It has a square cut, taking as the cutting plane the plane parallel to two orthogonal edges, passing through the middle of the other four edges. This shape is used to make four-sided dice and models some molecules with a tetrahedral molecular geometry such as methane.

In chemistry, tetrahedral molecular geometry is the geometry of molecules where a central atom, denoted A, is bonded to four atoms, denoted X, at the vertices of a regular (or nearly regular) tetrahedron. These compounds belong to the AX<sub>4</sub>E<sub>0</sub> class according to the VSEPR theory.

The bond angles are  $\text{Arcos}(-\frac{1}{3}) = 109.47^\circ$  when all substituents are the same, as in the case of methane (CH<sub>4</sub>). Perfectly symmetric tetrahedra belong to the  $T_d$  symmetry point group, but most tetrahedral molecules do not have such strong symmetry. Tetrahedral molecules can be chiral.

This geometry is close to the trigonal pyramidal molecular geometry (AX<sub>3</sub>E<sub>1</sub>), where the place of one of the substituents is held by a non-binding doublet. In this geometry the bond angles are less than  $109.5^\circ$ , for example  $107^\circ$  in the case of ammonia. This slight contraction results from the stronger repulsion that this non-binding doublet, relative to one substituent, exerts on the other substituents. As a four-sided polyhedron, the faces of a tetrahedron are always triangles, so a tetrahedron is necessarily a pyramid with a triangular base. The four vertices T,F,B,N are used to encode the 4 logical values of the tetrality ) namely TRUE=TB, FALSE=FB, B={TRUE and FALSE}, N={NEITHER TRUE NOR FALSE}. A tetrahedron has 4 vertices, 6 edges which are the six pairs of values TB,FB,TF, FN, TN, BN and 4 triangular faces which are the four triplets of logical values FBN, TBN, TFN, TFB. If the tetrahedron is regular, then its four faces are isometric equilateral triangles. A tetrahedron that has three right angles can be obtained from a cube or a right rectangular prism. It is called a trirectangular tetrahedron.

If group theory is the royal road to mathematically grasp the idea of symmetry, the symmetric group  $S_4$  is the indispensable key and the fundamental example to penetrate the world of groups and

possess its tricky mysteries. We can give the angular relations of any tetrahedron, besides the twelve angles of the four faces (calculable by the classical formulas of trigonometry of the triangle), there are six dihedral angles corresponding to the six edges, and four solid angles corresponding to the four vertices. Noting  $(P_1, P_2, P_3, P_4)$  the four vertices of a tetrahedron, we will note  $\theta_{ij}$  the dihedral angle between the two faces adjacent to the edge  $(P_i P_j)$ ,  $\Omega_i$  the solid angle in  $P_i$  and  $\Delta_i$  the area of the face opposite the vertex  $P_i$ ,  $i=1,2,3,4$  and  $j=1,2,3,4$ . The tools of vector calculus (scalar product and vector product) allow an easy calculation of these angles; we have for example  $\vec{n} = \vec{AB} \wedge \vec{AC}$  orthogonal to the face  $(ABC)$  and thus by posing  $\vec{n}_1 = \vec{P_1 P_2} \wedge \vec{P_1 P_3}$  and  $\vec{n}_2 = \vec{P_1 P_2} \wedge \vec{P_1 P_4}$ , we see that  $\cos \theta_{12} = \frac{n_1 \cdot n_2}{|n_1| |n_2|}$ . Girard's formula then gives very simply the solid angle  $\Omega_1 = \theta_{12} + \theta_{13} + \theta_{14} - \pi$ . Many formulas of trigonometry of the triangle can be generalized to the tetrahedron (some of them can be found in the article spherical trigonometry, and a complete set in the article trigonometry of the tetrahedron); for example, there is a "law of cosines" (analogous to the result of this name for triangles) linking the areas of the faces to the dihedral angles:  $\Delta_i^2 = \Delta_j^2 + \Delta_k^2 + \Delta_l^2 - 2(\Delta_j \Delta_k \cos \theta_{il} + \Delta_j \Delta_i \cos \theta_{ik} + \Delta_k \Delta_l \cos \theta_{ij})$ . There is also a relationship between the dihedral angles linked to the Cayley-Menger determinant equal to 0:

$$\begin{vmatrix} -1 & \cos(\theta_{12}) & \cos(\theta_{13}) & \cos(\theta_{14}) \\ \cos(\theta_{12}) & -1 & \cos(\theta_{23}) & \cos(\theta_{24}) \\ \cos(\theta_{13}) & \cos(\theta_{23}) & -1 & \cos(\theta_{34}) \\ \cos(\theta_{14}) & \cos(\theta_{24}) & \cos(\theta_{34}) & -1 \end{vmatrix} = 0$$

These angular relations are interpreted as a need to fill in the gaps in the truth values of the Boolean logic T (TRUE) or F (FALSE).

It turns out that the logical value B (see below) was treated as an established, stable, fixed value, just like the logical values F, T or N, whereas in fact the logical value B is only \*potential\* or \*partially indeterminate\* and could resolve itself later or in other circumstances like T or F.

Introduction: multi-valued logics. The truth values of dichotomous logic (called "Aristotelian", "binary" or "Boolean") are true (T) and false (F).

Since Aristotle, to whom we owe the exclusion of a third term (which forbids that an assertion can have a logical value other than true or false) and the principle of non-contradiction (which forbids that an assertion can be both true and false), modern thought allows itself few escapades outside the dichotomous straitjacket imposed by the exclusive use of binary reasoning in true/false, good/evil, for/against, 1/0, etc.

And yet, one can have various reasons for wanting to use more than two "truth values".

1. To fill in the "gaps" of truth values

Assertions based on false presuppositions.

According to Strawson, statements like "The current king of France is bald" are neither true nor false, but rather have a presupposition that is false. One might want to deal with these cases by using a third truth value (N) meaning "neither true nor false".

Contingent futures.

Aristotle himself raised the possibility that assertions about the future are neither true nor false at the present time.

2. To clarify the "gluts" (clutter) of truth values One might want to take into account the possibility that some assertions are both true and false. This idea may seem odd at first, but it has been suggested in response to certain paradoxes. Consider the assertion "This assertion is false" (a compact version of the liar's paradox). Suppose it is true. Then, since it says it is false, it must be false. So we seem to have a proof that it is false. But if it is false, then what it says (i.e. that it is

false) is true! So we also have a proof that it is true. One answer to paradoxes like this is to add a new truth value (B) meaning "both true and false". (Note: the terminology "gaps/gluts" is borrowed from Graham Priest: *An Introduction to Non-Classical Logic*).

3. For epistemological reasons Some people sometimes want to add a truth value for "unknown", so as to allow the three truth values "known to be true", "known to be false" and "unknown". But this seems to me a very weak reason to abandon classical logic. It seems to me more appropriate to keep the standard two-valued logic and to treat as such our lack of information about the truth state of certain statements: our ignorance of which column of the truth table corresponds to the facts can itself be an assertion that can be treated in binary logic.

4. to distinguish between different types of truth It has been suggested, for example, to distinguish between 5 values of truth: necessarily true, contingently true, unknown, contingently false, necessarily false. Again, this seems to me a bad idea. Instead of inventing a new truth value for "necessarily true", we can take into account the necessity or contingency of the truth of a statement with the help of another statement which is itself binary. So? In fact, none of the above reasons motivate this proposal of a four-valued logic; the motive is more simply a deep dissatisfaction with the archaic dichotomous vision of the world imposed by Aristotelian logic.

This extremely simplistic vision does not leave room for any of the nuances required by simple common sense. For example, during a conflict between two clans, the leaders of each clan will describe the opposing clan as "the axis of evil" and their own clan as "the axis of good"; dichotomous opposition which also offers them the principle of non-contradiction as a screen to hide from the members of the two clans that their respective leaders have a common interest in pursuing this conflict which keeps them in power; dichotomous opposition which finally allows the leaders of the two clans to adopt an identical attitude, *mutatis mutandis*, without awakening the skepticism of the members of their respective clans as for the reality and the logic of their respective proclamations, however diametrically opposed.

In political, religious, social or economic discourse, binary logic is now more often used as a tool of blindness to camouflage lies or lack of reasoning than as a tool of serious reasoning ("whoever does not wage war on terrorism supports terrorism" and other such nonsense). In other words, the "Aristotelian" logic has become, by its extreme simplism, a weapon of disinformation, a tool of make-up, a tool of lies. Thus abused, it has lost its reliability and has therefore hardly any place in the logical tools of the thinker.

On the other hand, in philosophical discourse as well as in technical or scientific discourse, dichotomous logic has long since reached its Peter's level (level of incompetence: the point where it ceases to be a tool for reflection and becomes a handicap to serious reasoning), as one realizes as soon as one discusses ontological questions, cosmology or theoretical physics: as long as a point admits of more than one interpretation, the discussion quickly turns into a dead end.

Of course, we are not going to throw away the dichotomous logic: this hammer of thought is still very useful to drive the nails of logical reasoning into the coffin of simple problems, but it is high time to put away this old tool with its rusty nail box in grandpa's toolbox and to learn to use a more adequate tool to drive the screws of logical reasoning into the coffin of complex problems.

I therefore propose below and in the following pages such a "screwdriver".

Forgive me for the dryness of this document: this precise reasoning tool is quite new to me; to elaborate its logical rules was not obvious, to get used to its use is hardly more so. I am after all a simple man, used for too long to trying to hammer in the screws and worried to see them fall one after the other...

For the lack of references, I present no excuses.

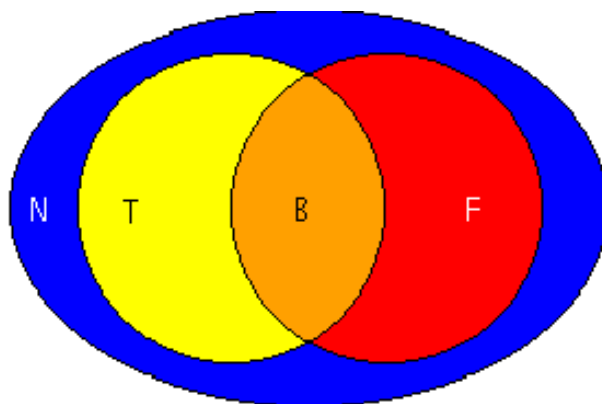


FIGURE 1C BIS: Venn diagram TFBN representing the 4 truth domains T,F,B,N

What is this? In aristo logic, any feeling or abstract concept is held to be true or false on a simple and completely arbitrary proclamation, without any logical justification. It seems more reasonable to hold as neither true nor false everything that is unverifiable outside the field of an individual or collective consciousness.

Moreover, aristo logic does not manage in a natural way the potentialities and indeterminations inherent to modern physics: superposition of quantum states, Schrodinger's cat experiment, nature of the electron and the photon, etc. It seems more reasonable to hold for both true-and-false any phenomenological reality that is at the same time otential or partially indeterminate.

In short, for a logic to be adapted to the present state of our knowledge, it must allow to handle not only the true and the false, but also the neither-true-nor-false as well as the true-and-false.

To avoid having to use potentially confusing formulas such as "true (T) and false (F) equals true-and-false (B)", let us adopt a logical system based on the following elementary values:

T : (strictly True) strictly-true, i.e. true-and-not-false (any verifiable, measurable, experimentable reality);

F : (strictly False) strictly False, i.e.: false-and-not-true (everything that is unreal, situated outside any verification framework);

B : (Both true and false) true-and-false (any potential or partially indeterminate phenomenological reality);

N : (Neither true nor false) (any unverifiable reality outside the field of an individual or collective consciousness).

This Venn diagram (FIGURE 1CBIS) can be read as follows:

The whole diagram represents the set of all possible assertions, it is the universal set or logical universe  $TFBN = (T \text{ or } F \text{ or } B \text{ or } N)$ .

A yellow circle represents the set of true assertions, it is the set "true" =  $(T \text{ or } B)$ .

A red circle represents the set of false assertions, it is the set "false" =  $(F \text{ or } B)$ . These two circles overlap in an orange zone (half yellow, half red) which represents the set of true-and-false assertions, i.e. those whose truth value is potential or partially indeterminate, it is the set "true-and-false" = B.

The pure yellow zone represents the set of strictly true assertions, it is the "strictly-true" set = T. The pure red zone represents the set of strictly false assertions, it is the set "strictly-false" = F. The blue zone represents the set of "neither-true-nor-false" assertions, i.e. those whose value is unverifiable

outside the field of an individual or collective consciousness, it is the set "neither-true-nor-false" = N.

The empty set  $\{\}$  is not visible on the diagram, since it does not include any logical assertion.

The sets T, F, B and N are disjoint (i.e. they have no elements in common). For the ease of writing formulas, we will use the following conventions. The symbols designate (FIGURE 1C BIS):

TFBN the logical universe (T or F or B or N) (the whole figure);

T the singleton T (strictly-true) (pure yellow);

F the singleton F (strictly-false) (pure red);

B the singleton B (true-false) (orange);

N the singleton N (neither true nor false) (blue);

TB = true pair (T or B) (yellow and orange);

FB = false pair (F or B) (red and orange);

TF = test pair (T or F) (pure yellow and pure red).

$\{\}$  the empty set ;

FBN the triplet (F or B or N);

TBN the triplet (T or B or N);

TFN the triplet (T or F or N);

TFB the triplet (T or F or B);

FN the pair (F or N);

TN the pair (T or N);

BN the pair (B or N);

We see that the symbols TN, FBN, TFBN, etc. are only abbreviations of the corresponding logical expressions (T or N), (F or B or N), (T or F or B or N), etc., which represent various states of uncertainty. It is clear that this logical system requires, contrary to the usual binary logic

1. to reject the exclusion of a third term in order to admit the set N of neither-true-nor-false assertions, and
2. to reject the principle of non-contradiction in order to admit the set B of true-and-false statements, and
3. to admit that some propositions are devoid of any logical value, i.e. are illogical.

A bisynchronous logic

The WAMM WAAM (universe) being formed of pairs of cosmos with opposite proper times, it is not stupid in my opinion to try to define a bisynchronous logic which works both "upright" and "upside down" in time. The subject is difficult, all classical and non-classical logics invented by earthlings work only "right side up", even temporal logic.

I propose a principle which could be used as a starting point: one should not decouple logic and the universe. The two worlds, logical and physical, should not be disjoint. To put it plainly, I propose to confuse truth and constructible existence: what can be constructed is true.

To go further, we have to distinguish between what exists in a "permanent" way and what has only a temporary "life span". These are two disjoint modes of existence, two different "truths".

Concretely, what does this lead to? To this: If the universe is a process, then some entities (structures) generated by this process will "survive" forever, others will not.

I will take an example (which should not be taken literally as a model of the universe, it is only to clarify what I am thinking about), considering a process simple enough but complex enough not to be computable: a cellular automaton. I repeat that I do not think that the universe is a cellular automaton, I just want to say that by studying a logic based on a cellular automaton we

can learn a lot about the "real" logic as defined by the U. Indeed, I have found a way to define a bisynchronous logic based on such automata.

To fix the ideas, let's consider the game of Conway's life (life). I will not recall the rules and I will assume that the reader knows the subject.

In life, some configurations survive eternally, and even grow eternally, like the slider. Others evolve towards stable or cyclic states, or disappear. This is true as long as we progress diachronically (forward in time). If we consider the retrochronous point of view, a difficulty arises because we are not mentally able to progress backwards in time: all we can do is, given a configuration  $c$ , determine what antecedents  $a$  has ( $a$  is an antecedent of  $c$  if  $c$  is the successor of  $a$ ). In life as in many other cellular automata, some configurations (and even the majority) have several antecedents, some have only one, others have none: these are the eden. The first eden for life was only found about ten years ago after an arduous computer search. The smallest known eden has more than a thousand cells! Seen in the retrochronic sense, a successor of a configuration is therefore an antecedent in the diachronic (normal) sense: successor- = antecedent +, and successor+ = antecedent-.

An Eden is thus a configuration  $c$  such that successor-( $c$ ) = empty. We can say that the configuration "dies" in the retrochronic sense. However the fact that any configuration has in general several antecedents+ leads to some problems: If we assume that a configuration is a "theorem" of the "formal system" generated by the cellular automaton, then we can define two notions of truth:

1. True-diachronous (true+): if the configuration survives eternally in the diachronous sense, that is, if the set of its successors+ is infinite. This is not a problem because a configuration has zero or one successor+ and "the configuration survives forever" is equivalent to "the set of successors+ is infinite".
2. True-retrochronous (true-): if the configuration survives eternally in the retrochronous sense.

But here it is not equivalent to "the set of its successors- (or antecedents+) is infinite", indeed as a config can have several antecedents+  $a_1, \dots, a_n$  one can have a line of universe  $i$  which ends in the retrochronous direction (thus by an Eden) whereas the other lines continue. The case "the lines continue" is therefore the general case and except for cases so rare that I don't even think they exist all configurations have at least one infinite line of successors. So they are all true-, our notion of truth- minus does not bring much...

But perhaps we could, using the analogy "Eden = death", say that we have false-( $c$ ) if  $c$  has at least one retrochronic lineage that leads to an Eden (config without successors-).

Thus if we define recursively that a config is dead in the diachronic sense or dead+ if:

either its successor+ is empty, or its successor+ is mortal+. In the same way a config is dead in the retrochronic or dead- sense if: Either the set of its successors- is empty (it is an Eden), or one of its successors (and not necessarily all of them) is mortal. And so here is our new version of the bisynchronous truth:

1. True+( $c$ )  $\Leftrightarrow$   $c$  is not mortal+.
2. True-( $c$ )  $\Leftrightarrow$   $c$  is not mortal-

Ah, logic! I think I spent more than ten years studying it. And the more I studied it, the more I felt far from my intuition: logic is the art of discerning the contours of "truth". Until my research led me into unknown corners and towards new ideas, which I think are fruitful, and which I would

like to share with you here.

So let's start with a little tour of the real and fake good ideas I had during this exciting exploration.

Formal systems

All existing logics are based on the notion of formal system: translated in simple language, it is a system based on axioms and rules, from which theorems are built. An example of a well-known rule, in classical logic, is the modus ponens rule: if A is true, and if "A implies B" is true, then B is true. The term "A is true", in a formal system, means: either A is an axiom (i.e. it is assumed to be true without needing to be proved), or A is a theorem (it has been proved previously from axioms and theorems already known).

The best known formal system is that of set theory. Formal systems are impressive constructions, because they can fit into each other: it is enough to add axioms or rules to a formal system to create another one. Thus the formal system of arithmetic can be created from that of set theory, but it can also be created from scratch from what are called Peano axioms. Formal systems are a great tool, because they allow to formalize (hence their name) demonstrations and to give rigorous proofs (as long as one accepts the axioms and rules of the said system).

Formal systems are however struck by a curse, Gödel's theorem, which says that any formal system that contains at least elementary arithmetic and that is non-contradictory is necessarily incomplete, i.e. there are true statements that can never be proved within the framework of this formal system. Gödel's theorem has destroyed the dream of mathematicians to "find everything that is true": they know that they will be able to approach the ultimate Truth, by creating new rules and new axioms, but they also know that they will never be able to "find everything that is true" (or false, for that matter).

It seems impossible to reason mathematically without a formal system, at least implicitly. But is it really true? Is it not rather a kind of mental block? My exploration of logic shows that there are ways to "bypass Gödel's theorem" and do rigorous mathematics without a formal system! But be patient, read the rest first...

Classical or Boolean logic

In classical logic, we consider only two truth values : "True", and "False". The rules of this logic exist since the antiquity, it is very intuitive and everybody knows it. However, did you know that there are in fact several classical logics?

The logic of zero order, also called logic of propositions, reasons from propositions. A proposition is a statement that is supposed to be true or false, and that contains no variables For example:

" $1+1 = 2$ " is a proposition,

" $f(3) < 2$ " is also a proposition (if we know the function f),

but " $f(x) < 2$ " is not a proposition if we don't know explicitly  $x$ , the logic of propositions is complete: it is not subject to Gödel's theorem, because it is not powerful enough to describe elementary arithmetic.

First-order logic, or predicate logic, allows one to reason from formulas that may contain variables and quantifiers, such as " $\forall x, 1-x^2 < 2$ ." Thus "if  $f(x) > 2$  then  $g(x) < 2$ " is a formula that can be true or false even if  $x$  is not known. For example if  $f(x)=x$  and  $g(x)=4-x$  then the previous formula is always true. Predicate logic allows us to describe everything we know about arithmetic; it is therefore (unfortunately) incomplete.

For example the famous fixed point theorem : "for any continuous function f of an interval I in this same interval I and such that  $f(I)=I$ , then there exists an  $x$  of I such that  $f(x)=x$ " is a theorem that uses the second order logic.

This theorem is interesting because it is an existence theorem: it demonstrates the existence



of a mathematical object (here the number  $x$ ) without saying which one it is exactly. The "constructivists" have challenged the existence theorems, arguing that they are not intuitive, more precisely "constructive". We will come back to this, because the constructivist arguments are for me very strong. With the existence theorems, we can prove statements that seem strange to us, like the theorem that there exists a good order on the set  $\mathbb{R}$  of real numbers (a good order is an order relation on a set such that any part of this set has a smallest element). Now the natural order relation on  $\mathbb{R}$  ( $'\leq'$ ) is not a good order because, for example, the open interval  $]0,1[$  has no smallest element for this order relation. So far, we have never been able to find a good order on  $\mathbb{R}$ , yet we show that there is one! Weird...

Even weirder is the Banach-Tarski theorem, which shows that, in three-dimensional space, one can cut a sphere into a finite set of parts, and then rearrange these parts to form a sphere of double volume! You will understand my distrust of non-constructive existence demonstrations...

Let us also note that classical logic does not allow to deal with self-referential propositions, those which refer (even indirectly) to themselves, like the famous proposition of the liar : "this sentence is false", or the couple of following propositions :

(a) : proposition (b) is true

(b) : proposition (a) is false

For classical logic, these propositions are neither true nor false : they are simply not propositions. Modal logics (I put the term in plural, because unlike classical logic, there are several different formulations, none of which can be considered as more intuitive than the others) are an extension of classical logic: they add to logical propositions and formulas the notion of modality, which allows to say in which context the formula is true. The two best known are epistemic logic or logic of knowledge, and alethic logic also called "logic of the necessary and the possible".

Here is a formula of the logic of knowledge:  $\text{sav}(\text{Andr }) : P \Rightarrow P$  it means that if the agent "Andr " knows that  $P$  is true, then  $P$  is true. This logic allows us to reason a bit like a group of humans exchanging their knowledge, considering what they know, what they know that they know (or that the others know), etc.

Modal logic allows us to solve some interesting puzzles, including this one: the wise man and the hats. Three wise men are in a room, each wearing a black or white hat on his head. They know that at least one hat is white. They can see each other's hats, but not the one on their heads. After a few seconds, the first wise man says, "I don't know the color of my hat". Then the second wise man says, "I don't know the color of my hat either. Then the third wise man can conclude: "My hat is white".

How did he do it? I can't resist giving you another puzzle, the solution of which involves both modal logic and arithmetic:

Peter and Paul

*Peter and Paul are two mathematicians who live in the same building. The concierge of the building, who is also a mathematician, likes to ask them "questions". One day, she meets them on the stairs, and tells them:*

*"Hello Peter and Paul, I have chosen two numbers between one and one hundred, it's up to you to guess which ones. Here is their product", she said, giving a paper to Peter, "and here is their sum", she said, giving another paper to Paul.*

*"I don't know what those numbers are," Peter said after looking at his paper.*

*"I don't know either," said Paul in turn.*

*"Ah, now I know both numbers!" said Peter.*

*"Oh, well, I finally know them too!" exclaimed Paul.*

And you, can you find these two numbers?

As incredible as it seems, there is indeed a unique solution! Modal logic is certainly interesting, but its automation is very complicated and rather inefficient: all the computer programs that have been created to automatically prove theorems of this logic run up against a combinatorial explosion and are very, very slow. (Let us point out that for classical logic of order 0 and 1, we have on the other hand efficient algorithms). Finally modal logic, like any formal system, does not escape the Gödel trap...

Temporal logics

Aristotle already said that a proposition which can be true today, like "the weather is fine", will not necessarily be true tomorrow, and vice-versa. Temporal logic can be considered as a kind of modal logic whose modalities are temporal values. Propositions are therefore true or false, but only over a certain time interval.

There are several temporal logics, with barbaric names: non-monotonic logic, synchronic logic, diachronic logic...

Trivalent logic

In trivalent logic, invented by the Polish Jan Lukasiewicz, we allow propositions to have three truth values, and not only two: "True", "False" and "Indeterminate" (or "probable", it depends on the interpretation). One can thus give a logical value to a statement like "Peter may come", or even better, "Schrödinger's cat is alive" (for those who know quantum mechanics).

We then build the truth tables of the functions "and", "or", and by extension "implies", "equivalence", etc. (in general we always arrange that " $P \Rightarrow Q$ " is equivalent to " $(\text{not } P) \text{ or } Q$ ". The interest of this logic is that it refuses the principle of the excluded third, which says that " $P \text{ or not } P$ " is always true. In trivalent logic, this proposition can also be indeterminate.

Frankly, I find it hard to see trivalent logics as anything other than computational devices. It doesn't seem to me to add much to boolean (bi-valued) logics. On the other hand, it can facilitate the analysis of natural languages. For example, in the study of the relations between humans we learn that love and hate are opposite, which can be formalized by " $\text{hate}(x,y) \Leftrightarrow \text{not love}(x,y)$ ".

But in reality one can have both love and hate for a person. So the above formalization is not always true. This is where multivalued logics can be useful. Except that in reality this kind of situation is much better treated with dynamic logics (which we will talk about later).

Tetravalent logic

In tetravalent logic, we consider four truth values. The problem is to give a meaning to these four truth values. The most common way is to name them "true", "false", "unknowable" (indeterminable), and "knowable" (determinable). But the last two can also be "neither true nor false" (indeterminate, unknown, etc.), and "contradictory". By constructing the truth tables of "and", "or", "implies", etc., one realizes that one can create a large number of tetravalent logics. I will not detail them here.

Tetravalent logics belong to the even larger class of multivalued logics, in which the logic functions have more than two values. My interest in tetravalent logics in particular comes from the fact that they appear in "ummite texts", which are (supposedly) of extraterrestrial origin. But in my opinion the tetravalent logic mentioned in these texts (whatever their origin) has nothing to do with a multivalued logic with four values as I described it above. It simply starts from a different conception of the universe. We will talk about this later.

The major disadvantage, for me, of all these multivalued logics is that as long as some of their logical values are considered as identical to the "true" and "false" of classical logic, multivalued logics do not allow anything more than these classical logics, or if one prefers they do not bring any new theorem whose variables have the only values "true" and "false". Knowing that "P is indeterminate

implies that Q is indeterminate" tells us nothing more about the case where P is true or false. Moreover, being formal systems containing arithmetic, they are always incomplete...

Fuzzy logics

The basic idea of fuzzy logic is that in many situations of everyday life, it is not possible to give a "true" or "false" value to a sentence, for example "there are ten blonds in this class": everything depends on what we mean by "blond".

We will therefore allow the propositions to have a continuous value, included in the interval  $[0,1]$ , with zero meaning "false" and 1 meaning "true". As for the  $1/2$ , it will mean "half true", or "half false", which amounts to the same thing (hmm... is it really sure?).

Fuzzy logic has many applications, but the main one is process control. For example, in a battery of elevators, there may be a calculation returning the information "you should go up", with a certain truth value, say 0.3, another one returning the information "you should slow down", with a truth value of 0.7, and another one signaling "you should go back to the first floor", with the value 0.1. How then to calculate the power to give to the motors and brakes? This kind of application is very important nowadays. For example, automatic subways are driven by fuzzy logic automata...

Here again, there are several fuzzy logics, which are distinguished by the way in which one will calculate the functions "or", "and", and "implies". In general, as for the other logics, we always arrange that " $P \Rightarrow Q$ " is defined by "(not P) or Q", and we also arrange to find the classical logic when we consider only the extreme values 0 and 1. Let's consider for example the fuzzy logic called of Zadeh :

non(a) = 1-a

or (a,b) = max (a,b)

and (a,b) = min(a,b)

But many other choices are possible. In fact we have to ask ourselves what properties we want to expect from "AND" and "OR". Mathematically, we consider that any t-norm can be used to represent AND, and any t-conform can be used to represent OR. What does this mean?

A t-norm is an application T of two variables satisfying the following constraints:

1 is the neutral element:  $T(1,x)=T(x,1)=x$

Commutative:  $T(x,y)=T(y,x)$

Associative:  $T(x,T(y,z))=T(T(x,y),z)$

Monotonic: if  $x \leq y$  and  $y \leq z$  then  $T(x,y) \leq T(y,z)$ .

A t-conform is an application S of two variables satisfying the following constraints:

0 is the neutral element:  $S(0,x)=S(x,0)=x$

Commutative :  $S(x,y) = S(y,x)$

Associative:  $S(x, S(y,z))=S(S(x,y),z)$

Monotonic: if  $x \leq y$  and  $y \leq z$  then  $S(x,y) \leq S(y,z)$ .

In fuzzy logic, the principle of the excluded third is contradicted: "A or (not A)" does not always have for logical value 1, and moreover "A and (not A)" does not always have for logical value zero! But after all, why not, as I said above, one can love and hate at the same time!

Personally, I don't like Zadeh's logic, which seems to be the simplest, because it introduces a non-derivability of logical functions (min and max are not derivable): When we draw the graphs of these functions, there are "angular points", which do not seem to me compatible with a logical reasoning that I would like to be "continuous".

The so-called probabilistic fuzzy logic pleases me much more, because it is continuous (Dombi's and Hamacher's logics are also continuous, but what a complexity!) But then another thing bothers me: if P is a proposition whose logical value is p, then "P and P" has for logical value  $p^2$ , and "P or P"

has for logical value  $2p - p^2$ , which makes that "P and P", "P or P" and P do not have the same logical values!

This seems strange to me... Is it possible to find a t-norm without "angular points" which respects  $T(x,x) = x$  ? (idempotence). It seems to me that it is not, unfortunately (but I could not prove it). However, it seems that the non-idempotency can be an advantage in some cases.

Linear logic

Suppose that A means "I have one euro", B means "I can buy a coke" and C means "I can buy a bus ticket". In classical logic, we have  $A \Rightarrow B$  AND  $A \Rightarrow C$ , from which we can conclude " $A \Rightarrow (B$  and  $C)$ ". But with one euro, we can't buy a coke AND a bus ticket! We need two euros for that, which can be expressed as "A and  $A \Rightarrow B$  and C". We see that the logical (and financial!) value of "A and A" is different from that of A alone. This idea is used in what is called linear logic.

Why linear? Because in classical logic we can use the proposition A as often as we want in a proof (in our example A is used to prove B and C). The proof is therefore a tree. In linear logic, we are allowed to use A only once in the proof and so it becomes linear. We can also consider the logical value of A as a degree of certainty that we have about its truth; if we have a certain degree of belief d in the fact that all birds fly, we have a certain degree of belief (probably also d) in the fact that a "random" bird flies, but surely the same certainty that a million birds in a same space fly simultaneously.

In fact in linear logic we consider two different "AND" operators! : The "and in addition" and the "and", with "A and in addition  $A \neq A$ " but "A and  $A = A$ "

But let's get back to the point. When we want to use fuzzy logic, we have to do two things: Figure out how to represent the logical value of the set membership relation: this is called the "fuzzyfication" problem. Choose a logic, and more particularly a way of computing the implication or fuzzy inference. Let's give an example of the first problem: how to give a logical value to the expression "stone is big" according to its size? In general, in fuzzy logic, we choose a function like FIGURE 1C BIS (2)

If Pierre is 1.62m tall, then "Pierre is small" has a logical value of 0.75, "Pierre is medium" has a logical value of 0.25, and "Pierre is large" has a logical value of 0. Of course one can choose other functions, for example functions without angular points like  $1/(1 + (x - 1,7)^2)$  for "Pierre is medium" (for example).

Another example (but not by chance) is the domain of real numbers. We try to give a fuzzy logic value to the proposition " $x=0$ ". It is obvious that the function :

$$f(x)=(x == 0) ? 1 : 0$$

answers the question (I used a computer notation common to C, C++, java, javascript, php, perl... if you don't know it, it means "if x is 0 then 1, otherwise 0").

But we can do better, if we change the semantics of the logical values a bit: if we agree that "1" means true and that "everything different from 1" means false, then a function like :  $f(x)=1/(1+x^2)$  is also suitable! (indeed this expression is only 1 if  $x=0$ ). I then had the crazy idea that we could rewrite all arithmetic, and in fact all mathematics, using fuzzy logic. The idea is that every mathematical proposition would have a fuzzy logic value associated to it, and in general different from 1 or 0. This logic value would always depend on one or more variables. Only the cases where this logical value would be 1 would be considered as demonstrations of "truth". We will in fact create a new formal system in which all the formulas will be of the form :  $P :: v$  where P is a syntactically correct set-theoretic proposition, and v is a logical value. The expression above means

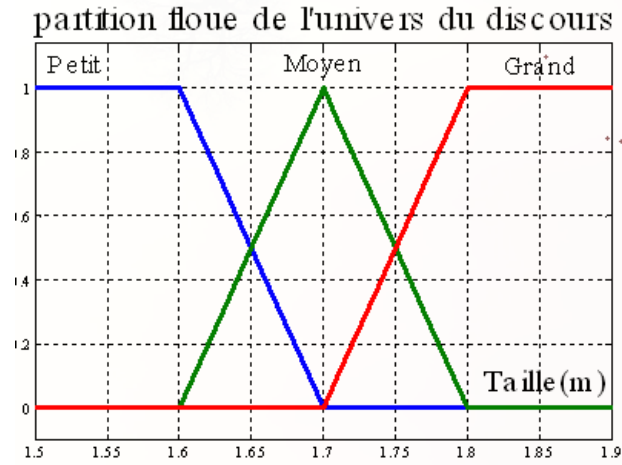


FIGURE 1C BIS (2): fuzzy partition function of the universe of discourse

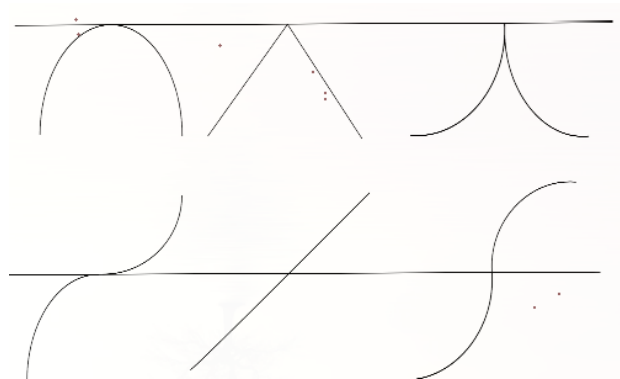


FIGURE 1C BIS (3): Three ways for a function to cross a certain value

"P is true with logical value  $v$ " (or degree of truth  $v$ ). The extraordinary advantage of this approach is that it finally allows to define equality. Indeed, in no formal system, we define equality! We only say that " $x = x$ " is true for all  $x$ . But the equality between two potentially different objects is not defined! With my system, it is not impossible to find a formula like :  $x=y::1/(1+(x-y)^2)$  which precisely defines the equality of two real numbers. See the inversion of meaning: instead of calculating the logical value of the expression " $x = y$ ", I define the equality by the expression above. (And of course, it only takes the value "1" if  $x = y$  intuitively).

Other expressions than  $1/(1+(x-y)^2)$  are naturally suitable for this; it will be necessary to find a "natural" and simple formulation of the theory of numbers, reformulated with the help of these formulas of the type  $P :: v$ , which I call the logic of valued propositions. I then wondered if it would be possible to differentiate "graphically" propositions like " $x < 0$ " and " $x \leq 0$ ". The answer may lie in the shape of the graphs. There are indeed three ways in which a curve can reach an extremal value, and three ways for a function to cross a certain value (FIGURE 1C BIS (3)). Of the three figures above, which one could best represent the expression " $x = y$ "? A priori it cannot be the one on the left (tangent) because if we place ourselves infinitely close to  $y$  (in  $x + dx$ ), the truth value ( $x + dx^2$ ) is almost indistinguishable from "true"... This kind of consideration makes me wonder if, in order to model at best the logical values of the propositions concerning the real numbers, one should not actually consider the surreal numbers in the sense of Conway, which are probably much "simpler"... But I'm going astray (maybe). And how to define the logical value of " $x \neq y$ "? The value should be 1 everywhere except in  $y$ , and if we want to keep continuity, (or even, dream, consider only  $C^\infty$  class functions), what to do? But let's not lose hope, because other extensions are possible a priori: for example by allowing logical values to be complex numbers included in the unit disk, and not only real numbers in  $[0,1]$ , we could define for each expression a "truth value" by the real part of the logical value, and a "falsity value" by the imaginary part. Thus the expression " $x < y$ " would have a simple valuation:  $x < y :: \text{sqrt}(y - x)$ .

Which is real if  $x < y$  and pure imaginary if  $y < x$  (sqrt is the square root function). So what is the correct formulation of the mathematical calculation? Should we use complex numbers or not? We will come back to this. But first we need to talk a bit about complex fuzzy logic.

#### Complex fuzzy logic

This is a little known and explored domain, quite new it must be said. The idea (due to G Spencer-Brown) is to give a complex logical value to logical propositions, which allows to consider propositions that would be contradictory in classical logic. But human beings reason well like that! We sometimes consider certain situations as being both true and false (to a certain degree), or we are unsure of the truth of certain facts, because we have plausible arguments that go both ways. The discovery of complex fuzzy logic actually started "by the back door", with the discovery of network fuzzy logics: in these logics, the truth values consist of a network of disjoint or mutually inclusive sets. In general we choose as a set of sub-intervals of the interval  $[0,1]$ . It turns out that interval or lattice-valued logic is related to tetravalent logic by the following theorem: For all fuzzy logics for which " $P$  or  $P$ " and " $P$  and  $P$ " have the same logical value as  $P$ , and whatever intervals we choose for their variables, two formulas  $P$  and  $Q$  are equivalent if and only if they are also equivalent when we choose the four intervals  $[0,0]$ ,  $[0.5, 0.5]$ ,  $[1,1]$  and  $[0,1]$ . In other words, two propositions are equivalent in network fuzzy logic if and only if they are also equivalent in tetravalent logic, with  $[0,0] = \text{"false"}$ ,  $[0.5, 0.5] = \text{"contradictory"}$ ,  $[1,1] = \text{"true"}$  and  $[0,1] = \text{"unknown"}$ .

The idea of giving complex logical values to logical propositions naturally follows the idea of giving them values in an interval. This idea is natural in quantum mechanics, where we consider complex wave functions, and objects that are both waves and particles.

In Spencer Brown's formalism, inspired by the way we use complexes in electricity (when we analyze an electric network by complexes, the imaginary part corresponds to the derivative of the signal), we use complex values, but still linked to tetravalent logic: indeed Spencer Brown states that the real and imaginary parts of the logical value are either 0 or 1 (it is not a fuzzy logic). The real part means "true" (for 1) and "false" (for 0), and the imaginary part means "it does not change" (0) or "it has changed" (1). Therefore there are four logical values:

$(0,0) = 0$  : false

$(1,0) = 1$  : true

$(0,1) = i$  : made false

$(1,1) = 1+i$  : made true.

This semantic allows to easily find the logical values of AND and OR for the new values: in particular we have  $(0,1) \text{ OR } (1,1) = (1,0)$  and  $(0,1) \text{ AND } (1,1) = (0,0)$ . Note this last expression, which means that a statement cannot be true and false at the same time. The next step is to give the logical values not four complex values, but an infinity. A first idea is to try to represent paradoxes (those situations where we have both A and not A) in fuzzy logic. For example in probabilistic fuzzy logic, we have  $(A::a \text{ and } B::b) :: a.b$  and  $(A::a \text{ or } B::b) :: a+b - a.b$

(I used the formulation described above where  $A::a$  means "the proposition A has the logical value a"). If we consider the expression "A and not A", then its logical value is  $a(1-a)$ . Let us then try to see what happens if we want "A and not A" to be true (and this would be a real paradox): we must therefore solve the equation  $a(1-a) = 1$ , whose solutions are the two complex numbers  $a = (1 \pm i\sqrt{3})/2$ , which are, by the way, also solutions of "A or not A is false".

By allowing complex logical values, however, we lose one important thing: it is no longer possible to find a total order between them, but only a partial order. Note that we also have this in tetravalent logic, since if we represent graphically the four values of this logic, we obtain a diamond...

Well, then what complex logics can we use?

In fact we can show that  $(A::a \text{ and } B::b) :: a.b$  is the only possible analytic (integer) function that extends fuzzy logic over  $\mathbb{C}$  on  $[0..1]$ . And moreover, the only domains of validity of the logical variables closed in this logic are  $[0,1]$ ,  $\mathbb{R}$  and  $\mathbb{C}$ . So if we need a non-real complex number, then we will need all of them. But there is something confusing about the logic we get, because we don't see the intuitive meaning of these complex values. OK, 0 means "false", 1 means "true", and  $j = (1 + i\sqrt{3})/2$  means "true and false (contradictory)", or "neither true nor false". But what is the meaning of -1, or of i, for example? Why do we have two values ( $j$  and  $j^2$ ), solutions of "(A and not A) is True"?  $j^2$  means " $j$  and  $j$ ". As for " $j$  and  $j$  and  $j$ " or  $j^3$ , it is -1, which could be interpreted as "triply contradictory". Now " $i$  and  $i$ " is also -1, but when we connect by AND two "triply contradictory" propositions, we obtain the proposition  $j^6 = 1$ ... therefore true. All this seems very strange to me.

Ternary fuzzy logic

Hence the idea I had to define a new complex logic by extending trivalent logic to the interval  $[-1,1]$ , (I called it "ternary fuzzy logic") and then extending it to complexes again.

When we want to create a logic whose valuations are in the interval  $[-1, 1]$ , there are two natural options:  $-1 = \text{false}$ ,  $1 = \text{true}$ ,  $0 = \text{indeterminate}$ ,  $1 \text{ or } -1 = \text{true}$ ,  $0 = \text{false}$  (and only the absolute value has an a priori meaning).

The first option is the most natural one, but does it really bring something new compared to the "0=false, 1=true, 1/2 = indeterminate" of the usual fuzzy logic ? it seems to be only a translation homothety...The second option also seems not to bring much compared to classical fuzzy logic, but if we could show for example that the logical value of " $x$  is integer" is  $\cos(\pi.x)$ , it would be nice...

As we have  $\sin x = \prod_{n=1}^{\infty} (1 - \frac{x^2}{n^2\pi^2})$  and  $\cos x = \prod_{n=1}^{\infty} (1 - \frac{4x^2}{(2n-1)^2\pi^2})$  and that " $x$  is integer" means in fact " $x=0$  or  $x=1$  or  $x=-1$  or  $x=2$  or  $x=-2$  or....", one would be tempted to believe that the OR function translates by the multiplication of terms of the form  $1-4x^2/(2(n-1)^2)$  which would be thus the logical value of " $x = n$  or  $x = -n$ ", except that it does not work for  $n = 0$ ! Moreover, translating the OR by multiplication is not at all natural, since in probabilistic fuzzy logic, for example, it is the AND that is translated by multiplication!

Hence the choice of a third option:  $0=\text{true}$ ,  $1$  or  $-1=\text{false}$  (and only the absolute value has a priori meaning). By reversing the "direction" of the logical values and making  $0=\text{TRUE}$ , we can keep the multiplication for the OR since the zero is absorbing for the multiplication and that " $P::0$  OR  $Q::v$ " has indeed for logical value zero (thus TRUE) for all  $v$ , which is the intuitive meaning of the OR. As for the NO, if we have  $P::p$ , its logical value would be  $1-|p|$  or  $1-p^2$ , transforming  $0$  into  $1$ ,  $1$  into  $0$  and also  $-1$  into  $0$ . We can then look for the logical value of AND : Since  $P \text{ AND } Q = \neg(\neg P \text{ OR } \neg Q)$ , and if  $P::p$  and  $Q::q$ , " $P \text{ AND } Q$ "::  $|p| + |q| - |pq|$

Somewhere, I have the intuition that the proposition " $x$  is integer" should then have the logical value  $\sin(\pi.x)$ , which in my notion I will write " $x$  is integer":: $\sin(\pi.x)$ . For this wonderful result of simplicity to be true, and according to the decomposition of the sine into infinite product, it would be necessary that OR is the product, that " $x=n$  or  $x=-n$ ":: $1-(x/n)^2$  if  $n>0$ , and that " $x=0$ ":: $x$  therefore since  $1-(x/n)^2 = (1-x/n)(1+x/n)$ , we are tempted to define the equality of two numbers as follows:

" $x = n$  AND  $n>0$ ":: $1-x/n$  (or is it " $x = n$  AND  $n\neq 0$ "?)

" $x=0$ ":: $x$

Since we have " $x=0$ ":: $x$ , it seems logical that " $x = n$ ":: $f(n,x)$ , with  $f(0,x)=f(x,0)=x \forall x$ . The function  $f$  must be symmetric:  $f(x,y)=f(y,x)$ .

Changing the logical system

The oscillatory model of psychic functioning requires us to distance ourselves from the Aristotelian model of thought. This one has been the joy of the scientific West for centuries. These few notes will try to describe another model which is "tetravalent", for the researchers who would be tempted to appropriate it in their turn. It is a model that is used instead of the Aristotelian bivalent logic model. This tetravalent model operates a lesser reduction of reality than the bivalent model. It is therefore "richer" than the bivalent model.

Aristotle had detached himself from the tetravalent logic, substituting it with a bivalent logic, a dilemma: something is true or false, it exists or not; there is no middle term (true AND false) nor a third term (neither true nor false). He refuted and mocked the very interest of tetravalent logic, with its four poles constituting the tetralimus. He knew the tetralimma under this form (in Ethics) : "so, not so, so and not so, neither so nor not so". This is the formula of Ainséité. The "thus" in question can be, as well, of having as of being. This is its great utility. I use "being" hereafter, as a demonstration for this article, but it could just as well use "having". Aristotle has biased his argument by taking as "so" only positive predicates, those which are self-evident, those which are concrete and which fall under the hand, "naturally" indisputable. He has doomed himself to not being able to understand the tetralimma which requires a thought of reduction and not a positivist affirmation from the start. His indisputability is, in fact, a stand for a higher authority that can decide between the true and the false. It is the position of a pseudo-dualistic monism, which has had a great posterity, because it legitimizes the authority of the tyrant. That today's science takes as its tyrant the opinion of an elitist assembly of peers, as prudent as possible, does not change the matter.

In the East, on the other hand, the tetralimma was to be developed particularly by an Indian



philosopher, Nagarjuna and his school, in the second-third century AD. Their work constituted, and still constitutes, the basis of the thought of the Buddhist Middle Way. It is reasonable to think of this as the culmination of a Greek influence of pre-platonic philosophers, through the Greco-Buddhist kingdoms of the East, which are better known today. The tetralimma is often written in a metaphysical form: "being, not being, being and not being, neither being nor not being". Buddhists use it in practice, in a kind of conceptual judo, to escape from dualistic reasoning that is too reductive. Without doubt, this limited use constitutes a distant application of Greek sophistry, still alive today. Closer to us, the tetravalent model was used by a French psychoanalyst, Dr. J. Lacan in his formalization of the "four discourses" around 1980. Lacan in his formalization of the "four discourses" around 1980. This formalization, which is a considerable advance for psychoanalysis, has received little recognition and use among his closest disciples, which shows the limits of its understanding. It must be said that his writing is much more elaborate, since it uses a quarter turn permutation of four elements in four "discourses", which gives a fractal aspect to his description of the functioning of the Unconscious.

A logical writing can be made more simply of this tetravalent model. The logical writing used in this article takes up and corrects the logical elaborations of Pr Tom J. F. Tillemans, discussed by Pr Guy Bugault in his invaluable book: "Does India think?"; we will write the four terms as follows (the sign  $\neg$  being the one of the negation) : To be  $\neg S$ , Not being  $\neg \neg S$ , To be and not to be  $\neg (S$  and  $\neg S)$ , Neither be nor not be  $\neg (\neg S$  or  $\neg \neg S)$ .

This writing has the great advantage of not positing a basic element, here the big S, the predicate, as supposed to "exist" from the start. For Aristotle, the affirmation or the negation of S is simply the affirmation of the existence, or not, of this element, supposed to be positive from the start and to which one would have access "naturally". A superior intelligence would know, thus, how to define the true and the false, to be able or not, to falsify the reality of the predicate. Now, the Aristotelian positivist simplification, of a fundamentally elitist nature, is no longer sustainable at the time of the discovery of the Freudian unconscious. It escamates the nature, fundamentally non-determined of S, for the psyche. It freezes the thought of the research. This indeterminacy is that of the "totipotency", of the "all potentiality" that is reduced by the "reduction" of each logical proposition. But, if building a model by a reduction is licit in science, it is still necessary that this reduction is not exaggerated with respect to its object. For a century, the Aristotelian reduction has become the enemy of science by exaggeration of reduction, by "reductionism", after having been its most cherished substratum. It is not a question of denying the reduction necessary to approach the Real. It is what the very functioning of the psyche practices. It is a question of not exaggerating this reduction, by excess of zeal. Today, it is time to return to a more realistic and tetravalent approach. The "convenience" of the binary has passed in favor of a "convenience" of the tetravalent, except, perhaps, to go shopping at the market.

Why a tetravalent model of reality? Because it allows us a completely new and functional conception of psyche. We obtain, with it, a model which is not transcendent to reality but "trans-levels"; that is to say that the levels of organization of reality are congruent with it. The human reality is made of different identifiable levels of organization: physical, chemical, biological, sociological etc. A same functional organization would be conceivable which would define this psychic reality, which "would be" the psychic reality itself, in its various possible reductions. This avoids having to consider the psyche as an "emergence" of successive hierarchical levels. The "levels" are functionally organized between them in a horizontal way and no longer "vertical". They are ways, for each one, to practice the reduction of the reality, to create a reduced real. The very term "level" should be avoided, as it immediately suggests a hierarchy of levels. It is a conceptual poison, stemming from

the Aristotelian divalent conception, where one of the dialectical poles must win over the other. It is a poison that has infested, for a long time, all neuro-psychology and has reached all psychiatry in the last decades. This provides us with a notion of the psyche that is more ambitious than anything else, since it is a question of going back on a thousand-year-old drift.

A functional model of the psyche

This model is "functional" because we see at once that two terms of the tetralemma are "writing oriented" towards the S: that of the being and that of the being and not being. While the other two are "reading oriented", as we shall see below. There is a double relation/opposition, a double dialectic whose interest is not to be spontaneously blocked like the poles of a dilemma.

Let us first look at the "writing-oriented" propositions of the tetralemma: Being  $\neg S$ , To be and not to be  $\neg (S \text{ and } \neg S)$ . The being is not an Aristotelian positivation; it is not an affirmed "existence" in the sense of ex-sister. It is, in fact, a rupture, a stop of its indetermination. It is an unstable and precarious exit from totipotency. The other proposal is that of the being and not being, that is to say the negation at the same time of its indetermination (the being), associated to the repression of the being. This is where our "Aristotelian" categories of thought easily slip and a great effort of the reader is required to get beyond them and to understand this pole of the tetralimma. This is the nature of Schrödinger's cat for physicists. It is the status, at the psychic level, of the object of the anal drive: brought to light and eliminated at the same time. It appears only to disappear at the same time. If the "geometrical" reality is the object of the "oral" impulse, as palpable and catchable, being part of the category of "being", reducing itself in the "non-being" (stabilized reduction of the predicate becoming conceptualizable), for this category, the one of "being AND non-being", it would be necessary to invent the semi-geometrical matter. Let us note that modern experiments in physics (2004) seem to open the way to such a conception, for example those which show the possibility for an atom to be two and one at the same time, by a particular link, experiments extending those of M. Aspect of 1982 on correlated particles. Theoretical physics might need to switch quickly to the use of a tetravalent logic model, in order to stop finding "strange" the irremediable infringements to materialist realism. It is just a violation of the limits of bivalent logical thinking. Biology, itself, would be well advised to consider life as belonging to this logical pole. Two other terms of the tetralemma are "reading oriented" of the S, that of the non-being and that of the "ni ni" (neither being nor non-being): Not being  $\neg \neg S$ , Neither be nor not be  $\neg (\neg S \text{ or } \neg \neg S)$ .

In the non-being, we have a repression of the being by the negation of the negation of the indeterminacy of S; it is not a magic cancellation of this one, as in a double algebraic negation which would give a positivation; we do not return to the original indeterminacy, but we practice a supplementary degradation, a stable "reading" of the evanescent reduction of the totipotency. This is the difference with Aristotelian thought.

The last pole of the tetralimma, which is also "reading oriented", is that of the "neither nor", which we must not reduce, here again, to negations canceling each other. Neither to be nor not to be, it is, at the same time the negation of the being and the refusal of the repression of the being. It is the off-whole that remains after the operation of reduction of the predicate, indispensable pole so that the psyche can function in its primary oscillations. It is the sacred of the sociology, the amorous modesty, the emotion of the body, the symbiotic fusion mother-child. To return to functionality, the poles of the tetralemma which are most opposed are, on the one hand, those of the writing of Being and that of the reading of "neither nor". We can dialectically oppose them in a first psychic oscillation: To be  $\neg S$ , Neither to be nor not to be  $\neg (\neg S \text{ or } \neg \neg S)$ .

Indeed, it is a question of considering, functionally, a "radical" opposition. If, in the first dialectical oscillation, one of the poles is the being, the most accomplished negation is not only the one that

negates the being but also the one that doesn't even contain the evocation of the being in the form of the repression of the being (the non being). The most radical opposite to the pole of being is thus that of the "ni ni". The "nor nor" is the unreduced totipotent, which remains after the operation of reduction. It is thus not the original totipotent. It is a remainder, a reserve. As a psychic pole, it is the pole of the reserve. On the other hand, the other dialectical oscillation that can be spotted, will be the one happening between the pole of writing of the being and not being and the one of reading of the not being: Not being  $\neg \neg S$ , Being and not being  $\neg (S \text{ and } \neg S)$ . In the pole of being and not being, we have a negation of indeterminacy (it is the being of the proposition), combined with a repression of it (the not being of the proposition). The most successful opposite is therefore the refoulement of the negation of indeterminacy, which we read as non-being. Why is this? Because the non-being already excludes the being by refoulement and excludes even more, denies to the maximum, the alliance of the two.

Use of the model in clinic

We will use the functional oppositions of the poles of the tetralimus in clinic, since the failures of the psyche will be described as effects of these dialectical oppositions, in their jamming and unjamming.

If one of the poles "resists" too much, as a means of psychic defense, it will prevent the psychic use of the others and, first of all, of its greatest functional opposite, hence the interest in freeing it. The cure will be the resumption of the dialectical function of this opposite pole.

If the uncoupling is forced and constrained, painful and painful, it will be at the origin of the appearance of the psychic symptom (see the various examples given on this site). The symptom will thus be the painful appearance, oh how much, of a pole of the psychic tetralimma, in a kind of abnormal functional healing of this one. The real cure will pass by the effective functional recovery of this psychic pole.

The researcher, concerned by the psychic symptom, will no longer be able to ignore these logical writings of the tetralimus, at the risk of remaining stuck and frustrated in the Aristotelian dilemma (as we can see so well at the moment in "cognitivism") and of losing the very object of his research. The clinic of psychic functioning allows us to bring out the proofs of the scientific validity of this tetravalent model. It is enough to realize the reality of the psychic symptom and of the modes of defense, so that a whole part of reality becomes comprehensible. Whoever is sensitive enough to human pain and distress, whoever shares the human condition, will find human condition, will find, in this way, something to alleviate his own suffering and his own distress.

Tetravalence And Binary Thinking

Beyond binary thinking. Logic is certainly the most indispensable thing in our everyday life, it is an essential element in our way of apprehending the world. It is what allows our brains to approach problems in an organized and structured way, and then to solve them by deducing solutions.

Let's look at different forms of logic. These may allow us to expand the range of representations we have of our reality. Let's start with binary logic. The word "logic" comes from the ancient Greek and means reason, language and reasoning. Reason allows us to set criteria for "truth" and "error" and to evaluate a problem with our own moral values. These criteria are shaped by language, these two references combined forming the foundations of our reasoning.

Nowadays, the most widely used linguistic logic is "Aristotelian" logic, which is based on a bivalent logic (with two values) and takes as its fundamental rule the principle of the "excluded third". This means that a third choice cannot enter the equation, the choice is anchored on two possible solutions ("true" or "false"), a third choice cannot exist. Thus, our linguistic structure is anchored on this logic and ultimately influences the way we conceptualize the world.

The notion of "right" and "wrong" is a perfect example of this; it is nothing more or less than a binary linguistic approach on which we build our moral concepts.

Countless cases of this type are easily found in our daily lives. For example, the cinema exploits this binary logic marvelously, the notion of "good guys" opposing "bad guys" is found almost systematically. Day versus night is also revealing, because reality is not so simple, of course, we have other words to express the moments of a day, but the dualistic shortcut comes almost naturally to mind. Dualism - which is a result of binary logic - is also used in major contexts, as in the case of armed conflicts. Remember G.W. Bush who, on the eve of the two wars in Iraq and Afghanistan, used the term "axis of evil" as opposed to the "axis of good" which, of course, was used to describe the Western "camp". The war posture is the caricatured use of the binary logic, either you are with us or you are against us. In this way we can describe ourselves as "good guys" and the other side as "bad guys". This pernicious process forces us to observe the geopolitical world in an extremely simplistic way. There are good guys, there are bad guys, and everyone imagines that this or that government is on one side or the other.

(This is only an example of bivalent thinking and is in no way representative of the current geopolitical situation. Depending on the point of view, the "sides" may very well be reversed but the reasoning will be just as false).

The bivalent logic is simply archaic, because it simplifies our reasoning to the extreme. It allows us, for example, to define an individual on the basis of one or two traits of his or her character and to extrapolate from there by making dark cuts on the complexity of his or her personality. Here is the real limit of this logic, it is unable to define complex things with precision.

Let's keep in mind that the factors that determine our world are numerous and complex, so approaching them with sincerity deserves the use of precise and subtle observation. It is likely that this bivalent logic greatly reduces our reasoning, this is noticeable when we unwittingly make dualistic, Manichean, simplifying, amalgamating, etc. reasoning.

In reality, the absence of nuance is the (limit) of bivalent thinking. (To see the world in binary logic is to see the world in black and white without any nuance of hues or colors).

Beyond binary thinking

Current systemic problems force us to think differently, to consider solutions from another angle, to think "outside the box". This ability to see the world in a different way is essential and we must develop it if we want to conceive and imagine new things. Of course, logic is only one of the parameters leading us there, but it is a relatively important one, because our logic allows us to conceive the world around us, just that!

Imagine your reasoning as a plan, this plan allows you to make mental images of the things around you. To construct this "plan" with a binary logic would be comparable to a construction in 2 dimensions, but this is not enough to describe a multidimensional world, we will necessarily need more "dimensions" on our plan.

Tetravalent logic

This is a form of logic that "completes" the bivalent logic, I would even say that it is its extension. It is a bit like the 2.0 part of logic, because it allows to go a bit further and to offer other perspectives of analysis and understanding. You may never have heard of it, yet you practice it naturally.

Its operation is based on 4 values, contrary to the logic based on two values [TRUE] or [FALSE]. Tetravalent logic is based on the following values: [TRUE], [FALSE], [TRUE] AND [FALSE], NEITHER [TRUE] NOR [FALSE].

At first sight, one could say that it is very nice, but what is the use of it? Good question! Well, nothing at all ?

Of course, this logic is very useful in the analysis of a problem. Because it allows us to conceive that a thing can be true and false at the same time or, on the contrary, neither true nor false. It is regularly used with the famous "yes and no", it allows a certain flexibility of reasoning that binary logic does not allow.

Let's take the example of a projection into the distant future, in reality nobody is able to be certain of what will happen, tetravalent logic allows precisely not to take a clear-cut point of view and allows to recognize the uncertainty as a possibility. Moreover, the notion of simultaneity of [TRUE] and [FALSE], allows to take into account contradictory points of view as a possibility, which is not the case with bivalent logic. For this goes against the principle of "non-contradiction" in which a thing cannot be true and false at the same time. The liar's paradox demonstrates the limit of bivalent thinking, just saying "I am lying" is indeed both true and false at the same time, because if I am lying and telling the truth, I am not lying.

In short, tetravalent logic allows us to take into account two other notions in our reasoning, uncertainty and contradiction.

-Biva: *"Would you rather die burned alive or eaten by insects?"*

-Tetra: *"Neither!"*

-Biva: *"But let's say you have to choose and you don't have a choice."*

-Tetra: *"Then I'll take both just to annoy you!"*

-Biva: *"..."*

Temporal logic

Temporal logic is one of the key elements, allowing us to go a step further in our logic. It allows us to add another dimension to our reasoning, and not the least, that of time. Indeed, a thing can be exact at a moment  $t$  and be inaccurate at another moment  $t$ . This parameter is very often put aside in the judgment we make of others. We see people as they are at the moment we meet them, without necessarily knowing their past, nor their future. Therefore, the judgment we make about them will necessarily be based on ONE moment  $t$ , not taking into account all the moments that have influenced or will influence their behavior.

This logic allows us to consider the world in a dynamic and evolving way. If we compare a river to the evolution of an individual over time, we will have to understand the river as a whole to have a real vision of what it really is - which is difficult to do - because we only have a partial vision of this river. Our analysis can only be based on the past and present of this river and a gigantic sum of factors determine its conditioning.

(How can we make a judgement about a person we have just met if we are missing the essential data - i.e. the past of this person - not to mention all the non-visible part that could be linked to the subconscious of a person or to a multitude of elements missing for an outside observer). In my opinion, temporal logic does not allow us to issue criteria of "truths" and "errors", it just allows us to conceptualize the other forms of logic in the time dimension. It allows us to see the world in motion, to make projections and not to remain stuck in a static vision of the world.

Principle of causality

To go even further and complete the temporal logic, the principle of causality will be the perfect element. This principle is more or less known by everyone, it is linked to the notion of cause and effect. This logic is based on the principle that there are one or more causes that come into play in the effect(s) of the state of an object, a phenomenon or a situation. Put like that, one could think that it is a bit complex, I reassure you, it is not only a bit complex.

However, this is quite obvious for objects whose temporal history is known, because it is easier to understand that an object is in such and such a state, if we know what happened in the life

of this object. The brain does not need to use the imagination and can logically retrace the path taken by the object in time to arrive at this precise state at a given moment. Thus, all things whose history is not really known can escape the logic of cause and effect, even if these things are extremely logical and deductive. Interestingly, this logic also allows us to determine the state of an object, a phenomenon or a situation in the near future by reversing the process.

Ex: "I know that if I drop an apple in my hand, it will fall".

If I know the causes, I know the effects before they occur. You will tell me, yes, this is all very well, but what does this have to do with binary logic? Well, quite simply that this principle allows us to understand much better the reasons why the state of an object is the way it is. It allows to deepen the image of what we observe in all its complexity and beauty. But for that you need to know and understand the causes that govern the state of the object you are observing, without that, you cannot understand what you are observing, you will make either shortcuts of thoughts "it must be that" or quick judgments.

In short, the oversimplification of binary logic will come back to haunt us. In my opinion, the most sensible posture when talking about something you don't really know the causes of is to say "I don't know" and not to make hasty value judgments.

Appreciating points of view

To end on a high note, let's address the posture of points of view. They don't work only by reasoning between oneself and oneself, but must imperatively take the opinion of other points of view. To do this, we will have to open wide our "mirror neurons" (also called by some scientists "empathic neurons"). As you can see, we will have to open up to others and exchange our points of view with those of our interlocutors, so far, nothing incredible.

However, we will have to completely erase or attenuate our old reflexes caused by the binary logic "I'm right - you're wrong", in order to truly appreciate the points of view. Not only will this be an extremely difficult exercise for some people who are used to functioning this way, but it will also be necessary to detach ourselves from the preconceived images we have of the person in front of us. This means taking into account our temporal logic and the principle of causality, which do not allow us to pass the slightest judgment on the person in front of us if we are truly sincere in our approach. In this way, we can learn to improve our own reasoning through others.

This process is indeed essential, because our point of view, which we think is "TRUE", is often not in reality. Simply because we lack a multitude of data and these parameters that escape us bias our reasoning. Broadening one's point of view does not mean "taking our word for it", but being in contact with other thoughts, other ways of looking at problems and solutions, other paths to which our brain would not have had access. This can be likened to a humble posture regarding our capacity of analysis and understanding.

All these different logics and ways of exploiting our reasoning are intertwined and will certainly allow a wider and more precise vision of the world around us. Binary logic is not bad in itself, it is just outdated, so it is up to us to consider the world from other angles, other ways of looking at problems and solutions. Creativity will do the rest.

An Internet user exclaims about binary versus tetravalent logic: "I have a big problem with one of the statements : For example, during a conflict between two clans, the leaders of each clan will describe the opposing clan as "the axis of evil" and their own clan as "the axis of good" dichotomous opposition that offers them first the exclusion of the term third party to falsely proclaim "who is not with us is against us" in defiance of those who want, with reason, to take sides neither for one clan nor for the other; dichotomous opposition which also offers them the principle of non-contradiction as a screen to hide from the members of the two clans that their respective

leaders have a common interest in pursuing this conflict which keeps them in power; dichotomous opposition which finally allows the leaders of the two clans to adopt an identical attitude, *mutatis mutandis*, without awakening the skepticism of the members of their respective clans as for the reality and the logic of their respective proclamations, however diametrically opposed.

In political, religious, social or economic discourse, binary logic is now more often used as a tool of blindness to camouflage lies or lack of reasoning than as a tool of serious reasoning ("whoever does not wage war on terrorism supports terrorism" and other such nonsense). In other words, Aristotelian logic has become, by its extreme simplicity, a weapon of disinformation, an instrument of make-up, a tool of lies. Thus abused, it has lost its reliability and therefore has little place in the logical tools of the thinker."

So first of all I hope that further on the author of this site will not have debunked himself and propose to us with his tetravalent screwdriver a logical equation of a military conflict and the position of the observers...

Secondly, the proposition "who is not with us is against us" is easily tested thanks to binary logic, either it is true or it is false. There is only one counter-example that breaks this kind of abusive generalist assertion, so I don't think it is necessary to dwell on it. Aristotelian logic dismantles this kind of simplistic binary reasoning, it shatters them in all simplicity. I don't see then how it can be blamed for being unreliable on this point and worse for being an instrument of falsehood."

Already, the problem is not displaced, in the sense that we do not solve some paradoxes to create others by switching to this logic.

All the statements compatible with binary logic are compatible with tetravalent logic (because binary logic is only a reduction of it). Are there any unsolvable cases left, I can't say. It is an illustration of the limits of a binary vision of the world. And it is clearly not this part that makes the interest of tetravalent logic. It is rather about saying that the binary logic imposes (falsely) that "who is not with us is against us". But here we are not talking about logic but about fallacious reasoning facilitated by the habit of binary logic as an easy solution. For me, this paragraph on conflict simply means that binary logic is reductive (and this point is mathematically demonstrated) and that it can be misused. The point is that binary logic quickly finds its limits:

"This sentence is false" illogical statement;

"This cake is delicious" subjective statement;

"The coin will fall on a pile" (sorry, I couldn't help myself ;) ) potential statement;

"Light is wave/corpuscular" duality.

Binary Logic cannot be held responsible for the aberrant uses that one can make of it. I think that language, necessarily simplifying, and the social relations they induce explain much better sentences like: "who is not with me is against me" than Logic and the principle of exclusion can do. It includes so many indeterminates that to pose it and to answer it logically (according to the binary Logic) does not bring much.

It is absolutely necessary to remove these indeterminates for it to make sense:

-What does "with" mean? An absolute submission or a critical support?

-What is its scope of application? A specific case or all cases?

-What are the consequences? Do we create a new enemy or do we just lose a friend?

...

I do not think that the binary logic induces de facto a Buschian vision of the World which has many other important causes... Is there somewhere an example of concrete application of tetravalent logic, which shows its superiority over binary logic? Tetravalent logic uses, as we have seen, binary inequalities which are called "binary inequalities with tetravalent logic" and which are of two kinds:

-the intricate binary inequalities  $1 \neq 0$  or  $0 \neq 1$

-disjoint binary inequalities  $1 \neq 1$  and  $0 \neq 0$ .

In the tetravalent logic, there are 4 possibilities:

- strictly TRUE ( $1=1$ ), the set  $A \setminus (A \cap B)$ ;
- strictly FALSE ( $0=0$ ), the set  $B \setminus (A \cap B)$ ;
- TRUE and FALSE ( $1 \neq 0$  or  $0 \neq 1$ ), the set  $A \cap B$ ;
- neither TRUE nor FALSE ( $1 \neq 1$  and  $0 \neq 0$ ), the set  $X \setminus (A \cup B)$ ;

In real life, a phenomenon can present a contradiction, a thing can be true and false at the same time. However, one cannot link this phenomenon to an equation, or a relation between several variables. But when it is the case, we can by replacing the variables by 1, obtain an algebraic relation at first, which belongs to the theory of numbers, and which at the end becomes a binary relation. If this binary relation is  $0=1$  and/or  $1=0$ , then we can cross the disjoint binary inequalities  $1 \neq 1$  and  $0 \neq 0$  which thus become the intricate binary inequalities  $1 \neq 0$  or  $0 \neq 1$ , and thus we have a contradiction between these two intricate binary inequalities and the equalities  $1=0$  and  $0=1$ , thus the cases TRUE and FALSE and neither TRUE nor FALSE skip, they disappear to leave room for the two equalities  $1=1$  and  $0=0$ , which are equal, and thus there remains the couple equality  $(0,0)=(1,1)$ , in other words  $(\text{TRUE}, \text{TRUE})=(\text{FALSE}, \text{FALSE})$ , it is only in this case that the tetravalent logic becomes fruitful and shows its clear superiority than the binary logic.

According to the Ummites, you have to follow the thought

$1=1$

$0=0$

$1 \neq 0$

$0 \neq 1$

and cross

$1=0$

$0=1$

$1 \neq 1$

$0 \neq 0$

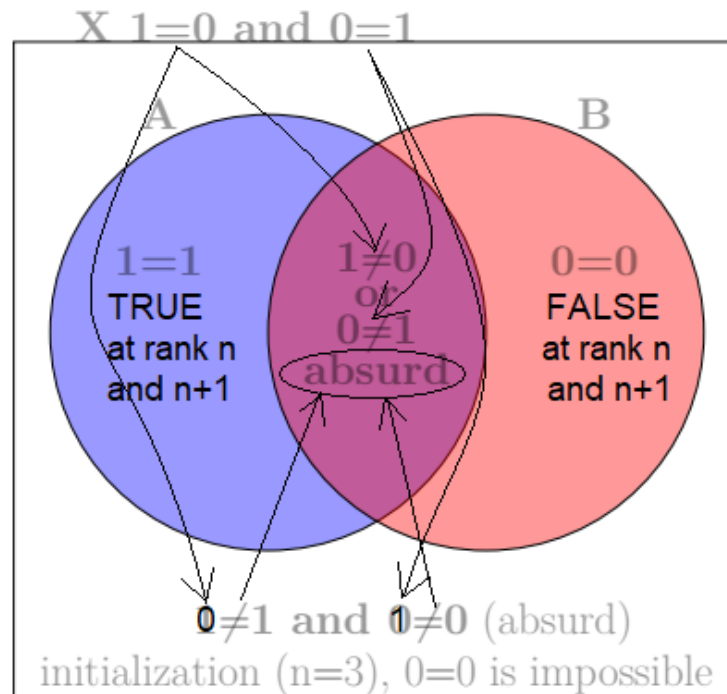
That is to say to combine equalities / binary inequalities with tetravalent logic.

Do you understand what this means? We will prove the Fermat's last theorem by first showing heredity (true at rank  $n$  implies true at rank  $n+1$ ) thanks to tetravalent logic and finally the initialization of the proposition (the case  $n=3$  demonstrated by Euler).

In the case of a demonstration by recurrence on the integer  $n$  greater than 1, the couple equality  $(\text{TRUE}, \text{TRUE})=(\text{FALSE}, \text{FALSE})$  means TRUE at rank  $n$  implies TRUE at rank  $n+1$  is exactly the same as FALSE at rank  $n$  implies FALSE at rank  $n+1$  In other words, we don't care if the proposition is TRUE or FALSE, it is hereditary, and this is where tetravalent logic shows its clear superiority because the equality  $(\text{TRUE}, \text{TRUE})=(\text{FALSE}, \text{FALSE})$  gives the heredity of the proposition by recurrence. All that remains is to initialize the proposition (see demonstration of Fermat's last theorem).

The problem is that in a concrete problem of everyday life, there are no binary absurdities  $0=1$  and  $1=0$  that illuminate the superiority of the tetravalent logic over the classical binary logic which





is based on the principle of the excluded third party. For example, the hexadecimal code of a pure red is #FF0000: the value of red is 255, which is its maximum, the values of green and blue are 0, their minimum. The yellow color code is #FFFF00. Thus, the orange color is defined by the code FF8000: 255 in red, 128 in green, 0 in blue. But a physical phenomenon that would be both RED and YELLOW, would logically have a "ORANGE" appearance with TRUE:=RED, FALSE:=YELLOW, TRUE and FALSE:=ORANGE.

Orange is a colour field of bright colours which, on the colour circle, take place between red and yellow. Orange colours are warm colours; warm colours are defined by their proximity to orange. They are considered stimulating and provocative. The neighboring fields are red and yellow, among the bright and saturated hues. Shades of the same dominant wavelength, but of less saturation and brightness are brown, those of high brightness, but not very saturated, are beiges. The term orange can be specified by adjectives such as clear or intense, which the standard also defines, and used to modify a nearby color, yellow, red or pink, depending on the tint, brightness and saturation characteristics of the shade described. The complementary color of an orange is a blue. With the illuminant D65 (daylight), the complements of the dominant orange wavelength between 584 nm and 605 nm are green-pulling blues and green-blue with a dominant wavelength between 482 nm and 490 nm.

The name of the color comes from the orange rings (the fruit). In subtractive synthesis, orange is obtained by a combination of yellow and magenta filters. With the dyes of paint, pencil, felt pen, orange is obtained by mixing a lot of yellow and a little red. The proportion is generally 3 to 4 parts yellow to a part red. However, red pigments that draw towards orange and orange pigments are often used. We can obtain very bright orange pigments giving almost optimal colors; but we

cannot reproduce these colors by additive synthesis on screen of television or computer. We must sacrifice either brightness or purity. The orange obtained in printing by four-colour printing is even more limited. Quadri orange, compared to pure orange, is considered a beige or orange brown. The printer can only obtain bright orange colours with specific pigments. In web browsers and derived applications, several keywords containing orange call conventional colors. The Colour Index lists about 80 orange (P0) pigments, some of which are more orange-red than orange, to which must be added some red-classified (PR) pigments.

No old dye produces an orange color. It is always possible to make an orange by mixing red pigments with yellow pigments; but this mixture is always duller than its components, especially as the shade of these moves away from that sought.

Two natural arsenic sulphides, the realgar (orange red or vermillion red) and the orpiment (from lemon yellow to golden yellow) have been known since antiquity. The realgar breaks down, by light, into a mixture of orpiment and arsenolite. These two pigments are both very toxic, and have the disadvantage of reacting chemically, because of the sulphur they release, with the other pigments to which they would be mixed. For the same reason, they are anti-siccatives in oil. These pigments were used for writing in gold letters without gold, in egg tempera, where their toxicity was used as a preservative. They have been abandoned.

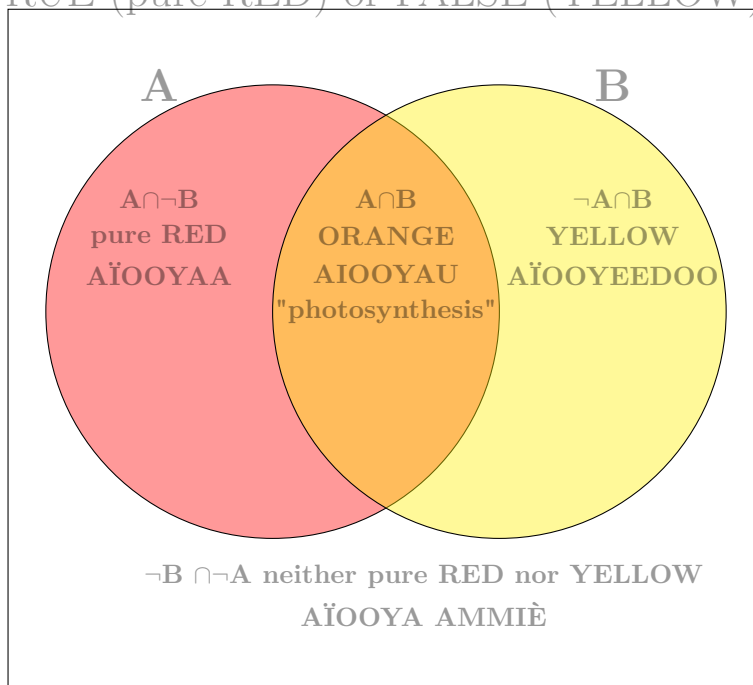
In the Middle Ages, lead minium (red) is used to make mineral orange. But according to Cennino Cennini, «it is good only on panel, because if you use it on wall, as soon as it is exposed to light, it becomes black and loses its color». It blackens when exposed to hydrogen sulphide or sulphide. It is therefore quite impossible to mix it with gold to make it more orange. The discovery of chrome in 1797 by Louis-Nicolas Vauquelin is significant: with these chrome orange, the artists have orange pigments<sup>8</sup>. Turner, the Impressionists, Van Gogh appreciated the chrome orange, although it was more expensive and less vivid than the cadmium orange invented shortly thereafter, and their stability was doubted, and mixed with other colors subject to restrictions. Their colouring power is however high. In 1820, chemist Friedrich Stromeyer produced a yellow cadmium sulphide that gave an orange hue under certain conditions of synthesis affecting the size of the grains. It entered the catalogue of color merchants from 1850. It is the first real bright orange. Sixty years later, an even deeper orange is made by precipitating cadmium sulphide with sodium sulphide and selenium. Cadmium oranges, classified PY37 and PO20 at the Colour Index, achieve excellent brightness and saturation characteristics, which have made them compare to optimal colours; they are opaque. The oranges developed in the 20th century (azo, perinones, quinacridones, isoindoline and pyrroles) offer cheaper alternatives than cadmia, and transparent, which is necessary for some applications. The suspicion of toxicity regarding cadmium pigments joins their high price to restrict their use. The colour merchants usually offer pigments «orange cadmium tint» which are imitations based on organic pigments.

The orange peel, the irregular aspect of the skin of the thighs and hips, specific to women, is related to the conformation and distribution of fat cells, as well as that of water and collagen fibres, these deep fibres under the skin. Citrus fruits, also called hesperides, have a particular anatomy. Pericarp and mesocarp are fused to form the bark. The outer part of the skin (also called flavédo) is orange, it is the pericarp. So here we have a natural phenomenon that generates a peel of "orange" color ie RED (TRUE) and YELLOW (FALSE) at the same time and without using artificial colors, It is photosynthesis which in plants and some bacteria is a process of making organic matter from the carbon dioxide of the atmosphere and (main case) water, using sunlight as a source of energy and producing a release of oxygen.

We therefore have two contradictory states that coexist at the same time for the old color of

the skin of the orange fruit. However, we cannot release from this phenomenon of synthetic manufacture of the outer layer of the orange fruit, an equation with the two input variables "COLOR RED" and "COLOR YELLOW", which allows to release the binary nonsense  $0=1$  and  $1=0$ , ie  $\text{TRUE}=\text{FALSE}$  and  $\text{FALSE}=\text{TRUE}$  which in terms of color gives  $\text{YELLOW}=\text{RED}$  and  $\text{RED}=\text{YELLOW}$ . In mathematics, we can equalize bit 1 and bit 0 via an algebraic relation, Fermat's equation  $x^n + y^n = z^n$  with  $(x, y, z)=(1,1,1)$  which gives  $2=1 \Leftrightarrow \{0=1 \text{ and } 1=0\}$  is an illustration of this but in color code, we cannot equalize the hexadecimal codes  $\#FF0000=\#FFFF00$ , because there is no algebraic relationship that allows them to be equalized by replacing variables by  $\#FF0000$ .

TRUE (pure RED) or FALSE (YELLOW) ?



The color is also present in the inner pulp of the orange fruit, and gives FF8000 color to orange juice with or without pulp. So the photosynthesis of the orange fruit shows us that tetravalent logic, the superposition of colors (here  $\#FFFF00$  and  $\#FF0000$ ) plays a role in the structure of living things. Other examples are marigold flowers, orange flesh of the melon, eggs of a sea urchin ready for consumption, dried apricots or carrots.

Orange filters are a fairly large class. In black and white photography, they are used to decrease the contrast of lips, veins, pimples, etc. on the skin, while increasing that of the eyes. In landscapes, they darken the blue sky and increase the contrast of foliage. In color photography, salmon orange filters are color temperature compensating filters, allowing natural light shooting with sensitive surfaces designed for artificial incandescent lighting. The orange color field is late distinguished from its neighbors red, yellow, brown and beige. In French, the name of orange color is attested only from the sixteenth century, the ancient languages assimilate oranges to yellow or red. Orange, unlike red, which exists in all the languages of the world with roots in the most ancient languages, cannot have any archaic symbolic association.

Orange is closely associated with heat, it is the typical warm color. Making, at the beginning of the nineteenth century, the inventory of symbolic colors from religious and heraldic texts, Portal finds it associated like the golden yellow to the revelation of divine love. Bacchus (Dionysus), representative myth of the Holy Spirit of Christian dogma, wore a saffron-colored garment. In ancient Rome, "the color composed of red and yellow was the symbol of indissoluble marriage. The wedding veil was orange, symbol of the perpetuity of the union. By a rule of opposition common to all symbols, the color also designates adultery, the love of human falsity, dissimulation, hypocrisy. The artist Vassily Kandinsky sought to base his compositions on the associations directly related to the abstract forms and the colors. He wrote of orange that it "resembles a man sure of his strength and consequently gives an impression of health". These associations of ideas are all personal; but in the West it is certain that orange has a positive value, because of its proximity to gold. Paul Signac attributes to Delacroix Baudelaire's statement: "Everyone knows that yellow, orange and red inspire and represent ideas of joy, wealth, glory, love.

Orange "also becomes the symbolic color of infidelity and lust [...], according to traditions that go back to the cult of Mother Earth [and to] the ritual orgy [associated with it].

In the Middle Ages, the redness of the hair indicated, at least in painting, proximity to the devil. Judas Iscariot was conventionally depicted as a redhead. Michel Pastoureau, in *Une histoire symbolique du Moyen Age occidental*, notes that in Germany, from the eleventh century onwards, the nickname "Iscariot" could hypothetically be broken down into "Ist gar rot" ("is all red" or "is really red"). In Hindu symbolism, the color orange designates the second chakra of the human body, it is related to creativity and dynamism. It is the color of the clothes of the sannyasin of Hindu asceticism, symbol of renunciation. The members of the sect of Osho Rajneesh also wear it, so much so that in the 1970s they were called "orange people". Buddhist monks also drape themselves in orange clothes. This would be the color of the garment that Gautama Buddha would have put on when he renounced the worldly life. He would have taken the shroud of a dead person in a cemetery to make it. It also symbolizes the renunciation. The saffron orange also reminds Buddhists of the color of gold, symbol of purity. Orange (or saffron) is the sacred color in Hinduism. It represents the purifying fire, of the body and passions, synonymous with liberation.

In the color code of electrical resistors and capacitors, the color orange corresponds to the number 3, the multiplier x1000 and a temperature coefficient of 15ppm. In the standard IEC 60757, it is noted OG (abbreviation of orange). In road signs, an orange light signal marks an alarm, a nearby danger, either in time, between green (free lane) and red (prohibition to pass), or in space (construction site signs, car flashers, hazard lights). In the standard of colored signage (ISO 7100), orange indicates an intermediate level of danger between green and red. The orange alert is the third level of alert, after green (no alert) and yellow and before the red alert, in the communication of weather forecasts by Meteo France and security alerts in the Vigipirate Plan.

As it is proven that the color orange is the one that stands out best in many environments, this color is used to signal hazards in many areas and especially in automotive and rail traffic. In many countries, the direction indicator lights (flashing) of vehicles emit an orange light. The second light (central position) of the traffic lights that regulate traffic at intersections is orange. Their use is not universal: most of the time when it lights up, it warns that the light is going to turn red, but in the UK or Germany, for example, the light goes through a red and orange phase before turning green. The flashing amber light has a different signaling from the fixed amber light. Generally, it signals a danger with free passage and possibly the respect of the right of way. In response to a study that proves that an orange light on the vehicle's clearance makes it much more visible to other road users, more and more vehicles are equipped with orange clearance lights, which come into operation

as soon as the vehicle's engine is running. The Golden Gate Bridge, San Francisco's famous bridge, is painted international orange, a shade designed by the architect, while the structures were still covered with the rustproofing layer of minium, to match the greens and blues of the landscape, after the decision to make the bridge a visual attraction.<sup>26</sup> The flight recorders, known as black boxes because the crew does not have access to their contents, are painted orange to make them easier to find if the plane is destroyed. Agent Orange is a chemical defoliant. Vigilance orange is a French public safety alert level. Prisoners in the U.S. prison system and in Guantanamo Bay wear orange. The use of the color orange as a political symbol increased in the early 21st century, probably because it was previously not associated with any of the ideological divisions of societies.

Flags and flags: Flag of Armenia Armenia, Flag of Bhutan Bhutan, Flag of Ivory Coast Ivory Coast, Flag of India India, Flag of Ireland Ireland, Flag of Niger Niger, Flag of Sri Lanka Sri Lanka; Flag of Nagano, Nagano Prefecture, Japan. Because the stathouder of the Netherlands was for a long time a member of the house of Orange-Nassau (lords of Orange, in France), In South Africa, the Orange is a river. The Orange Free State was a Dutch colony along this river, named after the princely house. The province of the Orange Free State is the current province corresponding to this territory. The Republic of Orange, is an imaginary country created by a Dutch political party. The Orange Order is an organization of Protestants in Northern Ireland opposed to separation from the United Kingdom, named after William III of Orange-Nassau, King of England in the late seventeenth century. The Order of Orange-Nassau is the civil honorary order of the Netherlands. Most of the country's sports teams play in its historical color, present on its former flag. In the Irish flag, the color orange symbolizes the Protestant religion, as opposed to the Catholic religion in green. White symbolizes peace between these two religions. Orange is the name of a county in California and it is also a municipality in that county: Orange. There is also an eponymous county in Florida, where the city of Orlando is located. The Orange Revolution is a series of demonstrations and strikes that took place in Ukraine following the presidential elections of November and December 2004. The symbol has also been used in Ukraine, Israel, Lebanon, and Corsica. In Canada, the New Democratic Party (NDP) is usually represented by the color orange. This color is also used by the provincial wings of the NDP as well as by Québec solidaire, a left-wing and sovereignist political party active at the provincial level in Quebec. In France, the Democratic Movement (MoDem), a political party of the center, has chosen the color orange for its logo.

This means that tetravalent logic actually recognizes 5 states for a proposition: true, false, true and false, neither true nor false, empty set. This is like saying that classical logic accepts three states: true, false and empty set. In both systems, "this proposition is false" belongs to an implicit category: the paradox. Tetravalent logic in my opinion is wrong when it claims to be a replacement or a complement to binary logic. It is not a mathematical tool but a rhetorical one and these claims are displayed from the beginning. I may have missed something but the capacity of tetravalent logic to determine the truth values of new propositions seems to me very limited. The explanatory tetrahedron shows that we are in rhetoric, not in math. That classical logic is inadequate to express all the nuances of human discourse, no one disputes. In politics, the opposite of true is not false. In logic, it is, and this is what allows words to have a precise meaning. Besides, tetravalent logic should be expressed in classical logic, it would be a little bit clearer I think.

But in fact it is the opposite. It is a mathematical tool, of which we give here a rhetorical use. Binary logic is a mathematical logic among others, not the only one: Polyvalent (or multivalent, or multivalued) logics are alternatives to the classical Aristotelian logic, bivalent, in which any proposition must be either true or false. They appeared from the 1920s, especially following the work of the Polish logician Jan Lukasiewicz. They are mainly studied at the level of propositional

calculus alone and little at the level of predicate calculus. They initially had their moments of success because they answered, in connection with quantum physics, a demand for the existence of a state other than true or false. Then, they aroused an independent mathematical interest, not linked to philosophical issues, when Chen Chung Chang formulated the concept of MV-algebra (en)1. Today, they are mainly studied in the context of the general questioning of the principles of the excluded third and of contradiction, thus giving rise to partial and paraconsistent logics. They are related to

- the intuitionist logic which does not accept the excluded third, because it identifies the mathematical truth with the demonstrable.
- modal logics.
- Kripke's models of intuitionistic logic, inspired by forcing.
- fuzzy logic, which adds to versatility the combined consideration of imprecision and uncertainty. More precisely, this logic is a non-countable-valued infinite logic because the truth value of a proposition is a real number between 0 and 1.

#### Examples of trivalence

An example from quantum physics is the Schrödinger's cat paradox. We can ask ourselves in which state the cat is at the end of the experiment, when we have not yet looked at it: is it dead, is it alive? No one knows (epistemic approach) and especially no one can demonstrate it (intuitionist approach). The proponents of the polyvalent logic have then brought in a new state, the cat is dead|alive (indeterminate), whereas in terms of Kripke's model, one would say that there are three possible worlds, a world where the cat is alive, a world where the cat is dead and a world where one cannot say whether the cat is alive or dead. However the world where the cat is dead (respectively where the cat is alive) is accessible from the world where the cat is alive or dead.

Partial logics take as a third value the "neither true nor false".

Paraconsistent logics interpret the third value as "true and false".

#### Completeness, satisfiability and functional completeness

Emil Post made a general study in 1921 showing that any polyvalent logic (with a finite number of values) is complete and that satisfiability is decidable. A  $p$ -valued logic has  $p^n$   $n$ -ary connectors for any integer  $n$ , but Post showed that one always has a functionally complete system (en) with two unary connectors (one of which is a circular permutation) and two binary connectors, min (generalizing conjunction) and max (generalizing disjunction); his construction is inspired by the disjunctive and conjunctive normal forms of the Boolean propositional calculus.

This concept, and for us this word, covers as much the palpable, dimensional realities as the psychological or emotional realities. AIOOYAA = (TRUTH)

There are (A) other (I) stable (O) entities (O) which are (Y) effective (A) stable (or permanent) sets [the first declination of this logic is that this signifying nucleus is effectively permanent (AA) - this therefore seems to say that concretely, this nucleus exists for good - it is activated in the real - there is an action in itself which realizes it and which allows this distinction to be realized; an effective action which allows this signifying nucleus to be constituted].

- AIOOYEEDOO = (FALSE)

There are (A) other (I) stable (O) entities (O) which are sets (Y) of modeling (EE) manifestations (D) of stable (O) entities (O). These are the mental constructions. [this core is now modeled; modeled means to be singularized, distinguished, while being articulated with what can participate

in other models; a model results, indeed, from a scientific "reduction" and one can catalog the possible reductions, it is the base of the cognitive capacities to reduce and to catalog, that is to say to abstract and to symbolize; this core is thus here virtualized and relativized with respect to the effective and separating activation of the first attribute, but it is indeed a question of abstraction of form, i.e. of a modeling of manifestations, with the etymological sense of abstracting, of drawing out of the real of concrete elements.]

- AIOOYA AMMIE [L]=(can be translated: TRUE OUTSIDE THE WAAM) There are (A) other (I) stable (O) entities which are (Y) effective (A) sets of real (A) stable (M) associations of emotions (IE) [we return here to action (in the effectivity of the concept A which is attached to the nucleus AIOOY), but not to the concrete activation of the first case (with the doubling of the concept A which characterizes it); the nucleus is not activated in itself by a creative action in reality but this nucleus is activated by the signifier "AMMIE" rendered by "true stable associations of emotions"; I have already indicated to you how the imaginary functions to group emotions into "stable associations", by the exterior, like the frame of a painting which groups together various elements inside it or like a sheep pen which contains, among other things, sheep, the dog, the shepherd and his bicycle; Here, I believe that it is that which makes it possible to connect the signifier "AMMIE" to the concept A attached to the nucleus AIOOY; it is an imaginary frame (in the sense that the imaginary, it is what builds images); it is "out of the WAAM" if one wants as all that is imaginary is not concretely in the universe.]

- AIOOYAU = (untranslatable in earthly language). There are (A) other (I) stable (O) entities which are (Y) effective (A) dependent (U) sets. [The opposition with the first principle is thus maximal, but a lesser opposition functions with the second and the third; with this fourth principle, we find the second way of functioning of the imaginary, from the inside this time; you connect different elements by a common property; there is a dependence which pre-exists; it is the dependence that is effective and it is necessary to connect then the concept A of the end of the signifier AIOOYAU with the final concept U and not with the nucleus signifiant AIOOY; it is the dependence that is now effective; we can see then this other aspect of the imaginary that is more impulsive, more basal; although the term emotion is vague enough to be used as well.]

The Ummites tell us what their logic is tetravalent and define it as follows: D59. As you know, formal logic accepts the criterion that you call the "THIRD-PARTY PRINCIPLE" (according to which any proposition is necessarily TRUE or FALSE). In our WUUA WAAM this postulate must be rejected. We then have recourse to a type of multivalent logic which our specialists call UUWUUA IES (TETRAVALENT MATHEMATICAL LOGIC) according to which any proposition will indiscriminately adopt four values:

- AIOOYAA = (TRUTH)

- AIOOYEEDOO = (FALSE)

- AIOOYA AMMIE = (can be translated: TRUE OUTSIDE THE WAAM)

- AIOOYAU = (untranslatable in earth language).

In theory it's able to make something coherent. If you describe a logic with four states and correct induction and inference rules, it can work. Apparently there is a functional logic with 3 three states (True, False, Unknown). But all this can be represented as statements of classical logic where (p=Unknown) is a proposition that is either true or false. We must already define this logic before applying it to elements.

In mathematics, the group S4 is by far the most used group to describe symmetries. The isometries of the tetrahedron are precisely isomorphic to the group S4, that's why the group S4 is important to characterize the tetravalent logic of the tetrahedron TFBN described before:  $\text{Isom}(\text{TFBN}) \cong \text{S4}$ .

There are 24 isometries that leave a regular tetrahedron invariant. Their set is a group isomorphic to the symmetric group  $S_4$  (group of permutations of order 4).

Isometries that leave :

\* leave 3 vertices fixed: only 1: the identity

\* leave 2 fixed vertices : 6 : the orthogonal symmetries with respect to the median planes of the segments TF, TB, TN, FB, FN, BN

\* leave 1 vertex fixed: 8 rotations (for each vertex 2 of which it is the center, the angles are  $2\pi/3$  and  $-2\pi/3$ )

\* exchange the vertices 2 to 2 : 3 half-turns of axis the perpendiculars common to the opposite segments,

the other : 6 are the compound of an axial rotation and a plane symmetry.



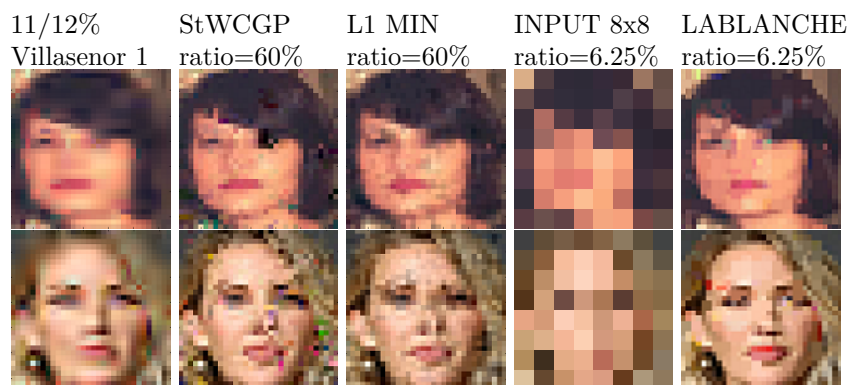


FIGURE 1: Comparison of the reconstruction methods.

## 2 Image depixelization with angular deconvolution and quantum computer

FIGURE 1-From Left to Right: 11% and 12% of Villasenor 5 larger coefficients approximations (Left column), Stagewise Weak Conjugate Gradient Pursuit (StWCGP) in Villasenor 5 basis from 60% of randomly known pixels (Middle Left column), L1-Minimization in Average-Interpolating 8 basis from 60% of randomly known pixels (Middle column) and our method LABLANCHE depixelization ( $L^{(i)}, \theta^{(i)}$ ) (Right column) from 6.25% of known pixels (8x8 low resolution input). The motion blur filter is the only one deconvolution filter which gives acceptable results, so the depixelization process is based on angular adjustments.

«[FRENCH] Est ce une image de OEOE 95 dans l'image d'en-tête de compte OOMO TOA ? Oui. Son visage a été pixelisé d'un portrait afin de masquer les détails. Cependant il est clairement reconnaissable[ENGLISH] Is this an OEOE 95 image in the OOMO TOA account header image? Yes. His face has been pixelated from a portrait to hide the details. However, it is clearly recognizable», said the Ummite OYAGAA AYOO YISSAA on his twitter account (<https://twitter.com/oyagaaayuyisaa>).

The patented interpolation method gives better results than other interpolation methods for image depixelization. This method is based on our research work on image reconstruction from incomplete data and posted on arxiv.org and conducted since 2011. For the 8x8 Marie Bonneau image, the reconstruction reaches 95% of the artificial intelligence reconstruction of Google Brain. The 8x8 Marie Bonneau image is interpolated using a series of conditional interpolations ( $p2, p3, p4, p'2, p'3, p'4$ ), a  $\gamma$  magnification factor of the interpolated image and at the end a series of deconvolutions ( $L^{(1)}, \theta^{(1)}, L^{(2)}, \theta^{(2)}, L^{(3)}, \theta^{(3)}, L^{(4)}, \theta^{(4)}, L^{(5)}, \theta^{(5)}, L^{(6)}, \theta^{(6)}, L^{(7)}, \theta^{(7)}$ ) applied one after the other, where  $L^{(i)}$  are the different values of the "LENGTH" parameter of the motion blur filter and  $\theta^{(i)}$  are the different values of the "ANGLE" parameter of this same filter. OEOE 95 is a human being from Ummo deceased in 2015 who was the leader of the first Ummite expedition on Earth in 1950 and who devoted his life to the study of "our terrestrial civilization", he noted in particular the intellectual and behavioral disharmony which reigns between the individuals. According to OYAGAA AYOO YISSAA, the Ummites managed to depixelize the face of one of



their OEOE 95 goal but we managed to depixelize the face of Marie Bonneau, so the Ummites are not humorists but real extraterrestrial human beings.

⇒ <https://patents.google.com/patent/FR3082980B1/fr>

Here,  $\theta^{(1)} = 105^\circ$  for Marie Bonneau and  $\theta^{(1)} = 120^\circ$  for Ellie Goulding (see FIGURE 1 and 1D).

The values of the parameters are given in Tables 1 and 2. We think that the head of Ummites on Earth, Mr OYAGAA AYOO YISSAA thought not to take any risk because he knows that it was out of reach with the current terrestrial technological tools, but it was without counting on the pugnacity of S bastien LABLANCHE. Indeed, the strategy of the extraterrestrial visitors has always been to give a part of information that is considered false in the state of scientific knowledge of the current year, here 2019. However, technologies evolve very quickly and there are recipes that allow to compensate the technological delay. They adapt to the state of knowledge and techniques in order to give some information that makes them partially untrustworthy to create doubt.

The head of the Ummites OAY knows very well that the depixelization of images requires very advanced angular adjustments and the capacity of the Ummites computers allows him to adjust the optimal combination which gives a reconstruction which resembles, because the statistical modulus combined with the power of calculation allows it to detect the optimal parameters in a limited time, the computer is able to find the optimal parameters which give the reconstructed image closest to the truth (Ground Truth) which is compared automatically by superimposing the 2 images: image being reconstructed and the initial image. It is the computing power of these titanium blocks that relieves the user and thus depixelizes the faces of OEOE 95 and Marie Bonneau.

Marie Bonneau participated in the association Jalle Astronomie (JA) de Martignas when I was a teenager, I watched her behind the telescope hidden in the woods of the jalle, she looked at the stars, without knowing that among these stars, there was the star of the Ummites: IUMMA; and that the planet UMMO was revolving around it, she was passionate about astronomy, and she had her head in the stars in spite of her natural arrogance. Her natural beauty and superior intelligence managed to mask her inner ugliness, which was merciless to the poor ugly and insecure teenager that I was at the time, in 2001, one year after the death of Jimmy GUIEU.

Marie was interested in the galaxy and the stars, but she did not know that extraterrestrials were already on Earth, and that the shape of galaxies could be explained by translating Einstein's relativity with angular magnitudes underlying tetravalent logic. We may one day be able to explain the shape of Marie's pussy, women, the other mystery of the universe according to Emmett Brown.



Quinn/Wade Mary (nice) Mary (nasty) Marie (nasty)

FIGURE 1D: Comparison between the depixelated facial features of OEOE95 and our depixelization test on Marie's face. The reddish-looking atmosphere of UMMO caused by rays from 36 Ophiuchi B, orange dwarf located at 19.5 light years from the Earth, their star "IUMMA" is in the background. - PEACE TO YOUR SOUL OEOE 95, REST IN PEACE FOR ETERNITY.

Table 1: MARIE BONNEAU INTERPOLATION USING FOCUS MAGIC 4.03

p2=135	p3=10	p4=20
p'2=255	p'3=255	p'4=255
$\gamma = 2.25$	$L^{(1)} = 13$	$\theta^{(1)} = 105^\circ$
FOCUS MAGIC 4.03/DVC	FM 4.03/DO	FM 4.03/100%
$\gamma=1$	$L^{(2)} = 5$	$\theta^{(2)} = 5^\circ$
DVC	LO	150%
$\gamma=1$	$L^{(3)} = 17$	$\theta^{(3)} = 340^\circ$
DVC	DO	0%
$\gamma=1$	$L^{(4)} = 20$	$\theta^{(4)} = 55^\circ$
DVC	DO	0%
$\gamma=1$	$L^{(5)} = 18$	$\theta^{(5)} = 350^\circ$
DVC	DO	0%
$\gamma = 1$	$L^{(6)} = 15$	$\theta^{(6)} = 175^\circ$
DVC	DO	0%
$\gamma = 1$	$L^{(7)} = 3$	$\theta^{(7)} = 90^\circ$
DVC	AUTO	75%
p2 <sup>(end)</sup> =255	p3 <sup>(end)</sup> =255	p4 <sup>(end)</sup> =255
p'2 <sup>(end)</sup> =255	p'3 <sup>(end)</sup> =255	p'4 <sup>(end)</sup> =255

Table 2: ELLIE GOULDING INTERPOLATION USING FOCUS MAGIC 4.03

p2=85	p3=55	p4=0
p'2=255	p'3=255	p'4=255
$\gamma = 2.20$	$L^{(1)} = 10$	$\theta^{(1)} = 120^\circ$
FOCUS MAGIC 4.03/DVC	FM 4.03/YES	FM 4.03/125%
$\gamma=1$	$L^{(2)} = 11$	$\theta^{(2)} = 85^\circ$
DVC	YES	50%
$\gamma=1$	$L^{(3)} = 18$	$\theta^{(3)} = 290^\circ$
DVC	DO	0%
$\gamma=1$	$L^{(4)} = 8$	$\theta^{(4)} = 305^\circ$
DVC	DO	25%
$\gamma=1$	$L^{(5)} = 18$	$\theta^{(5)} = 85^\circ$
DVC	DO	0%
$\gamma = 1$	$L^{(6)} = 16$	$\theta^{(6)} = 170^\circ$
DVC	DO	0%
p2=255	p3=255	p4=255
$\gamma = 1$	$L^{(7)} = 5$	$\theta^{(7)} = 40^\circ$
DVC	DO	50%
p2=55	p3=55	p4=55
p2 <sup>(end)</sup> =255	p3 <sup>(end)</sup> =255	p4 <sup>(end)</sup> =255
p'2 <sup>(end)</sup> =255	p'3 <sup>(end)</sup> =255	p'4 <sup>(end)</sup> =255

In the episode "Invasion" of season 2 of the television series SLIDERS, Quinn and his friends arrive in a world where hideous beings from a parallel Earth (the Kromaggs) invade this world. At the start of the episode, Quinn thinks they are aliens.

At the end a woman named **Mary** betrays Quinn and gives the information which will allow the Kromaggs to see all the Parallel worlds that Quinn and his friends visit and thus invade the Earth where Quinn comes from and capture Wade, the best friend of Quinn. Here, it's **Marie** who broke my heart and the brain in my adolescence during the school year 2000/2001 at the college of Martignas sur jalle, in France when I watched the SLIDERS series on television on Friday nights and it is the image of Marie which makes it possible to detect the extraterrestrial presence on Earth and thus to ask them to invade this planet and this dirty race of the Earth. The roles are finally reversed and revenge is a dish best served cold. The human race on Earth will have to submit completely to the extraterrestrial races that visit it, including the Ummites who are not the most advanced. Then, this dirty race of the Earth will disappear and all forms of life on Earth also because I will give the order to vitriolize this planet so that the Earth will never shelter life until the explosion of the sun. The tens of billions of terrestrial humans will disappear, it will be a big step for the milky way galaxy and its million civilizations. I will end my miserable life on Ummo by thanking the aliens for eradicating this filthy race. I will remain a virgin until the end of my life, because too ashamed of belonging to this race, what a pity that I cannot give birth to a hybrid, to tell him that he must be ashamed of his terrestrial part, so Shame he has to go too. I will nevertheless continue to ejaculate on a submissive transexual like a female dog. I hope that those who hide underground thinking of naively escaping death, will suffer even more before dying, they deserve it, and I hope that all this shit will evaporate into invisible and undetectable atoms by the best extra technologies -terrestrial. A big thank you to them for eradicating this dirty race that should never have seen the light of day. Shame on the aliens who intervened hundreds of millions of years ago so that life could appear, they will be cursed until the end of time. This filthy earth race is not the will of God but of Satan. Thank you for carrying out an order, thinking about the vitriolization of this planet and this race, I ejaculate with pleasure, it's worth all the sexual pleasures and fantasies imaginable, and I know something about it. Life on Ummo is great, I will be the last earthly human in the universe, and I know that after me there will be no more representatives of this dirty race, it increases my ejaculatory pleasure. The planet Earth will be an inert cold star OYAGAA, a big pebble in the shape of a ball, and we will take a picture of the result of the vitriolization, it will be my last ejaculation, the most voluminous, and I will take my time, I who follow a God, because rejected by this race, when one is rejected by Satan, one is God, Sébastien Alexandre LABLANCHE is the generating system GOD of the universe. I think about the future of the universe serenely, knowing that it will disappear in turn, but it doesn't matter, the important thing is to have eradicated this dirty race. God will cause the existence of new sheaves of intelligent universes which they will grant to the angle the dimensional character and whose existence will be the only fruit of the divine will, this last point is very important. Marie Bonneau and all her descendants are now reduced to the state of atoms and will never resurface; and never again will this race be talked about in the milky voice, what happiness to know that they have disappeared, finally the will of God is respected.

Now I can enjoy alien food, air from the planet 20 light years away, the sun is far away, it's shining in the sky, and that vulgar race won't bother anyone, and when I look at the sky, I see the milky way, and its legitimate civilizations and their affiliated planets hidden behind their stars, they will disappear in their turn, but the spirit of the generating system GOD will never disappear. The spirit of God will remain for eternity, Sébastien LABLANCHE who drinks a pack of milk a day,

has done the Milky Way a favor by demanding the disappearance of this dirty race from the Earth, the solar system is now inert and the races extra-terrestrial superiors can wait for God to decide the date of their disappearance, because it is he who allowed their birth.

This race should never have existed, and this planet which is no more than a vulgar spherical pebble should never have sheltered life, we finally have a pure galaxy without dirt, nor filth, without disharmony, without ugliness, without stupidity or vulgarity. Thank you alien races for eradicating this filthy race and destroying life on Earth, Charles Darwin's Evolution thanks you very much. Finally we are rid of this rot, this infamous shit, a big thank you for having done justice to the universe and to the supreme creator. This planet and these living species are now like the dinosaurs, and they will never resurface, filthy race. The krommags are ugly on the outside but this human race represented by Marie Bonneau and Ellie Goulding was filthy on the inside and even on the outside, now eradicated, it is Beautiful in death. The men and women of Earth are beautiful once dead, and now they are all dead.

« Nothing is closer to the TRUTH than the FALSE » Albert Einstein.

Tetravalent logic allows to explain the structure of the universe because an assertion can be TRUE and FALSE at the same time, and it can be neither TRUE nor FALSE. All the experts told me that image depixelization was impossible, that this technology does not exist, that the person who would succeed in depixelizing an 8x8 image, should put his discovery in the name of Christopher Columbus, but I am not Christopher Columbus, I am Sébastien LABLANCHE, if God is with me, Marie Bonneau will be completely depixelated in a few years like the Virgin Mary who came back to Earth to reveal her messages at Fatima and when the sun starts to dance, I vibrate to the rhythm of the Gladiator theme by Taylor Davis, the ground vibrates, the violin creates vibrations in my eardrums, in my brain, in my heart and the sun of Fatima tunes itself to this rhythm.

But anyway Sébastien LABLANCHE is the generating system, he can recreate a human face from nothing, he managed to make something that does not exist. THEREFORE it exists and it does not exist at the same time. « Artificial intelligence is no match for natural stupidity » « The measure of intelligence is the ability to change » Albert Einstein.

The stupidity is to believe that I managed to depixelate this image using artificial intelligence, because true intelligence is the ability to adapt and change according to situations.

OEOE 95, son of OEOE 91, biologist, 31 years old from Earth and father of 4 children, was the leader of the first UMMO mission to Earth in March 1950. He dedicated most of his life to the study of our civilization (1948-2015). He died on Ummo in May 2015, at the age of 96 Earth years. The diminutive of the name OYAGAA AYOO YISSAA consists of the 3 letters OAY. OT is the diminutive of OMMO TOA, the little effeminate being that accompanies OYAGAA AYOO YISSAA (see FIGURE 1D BIS).

This name OEOE 95 is mentioned in Ummite letters (D) and tweets:

March 1967 (D57-3); in 1969 (D74); POSTHUME

May 2015 (OT-19; OAY-22).

You can read now an excerpt from this UMMITE extraterrestrial tweet exchange, it is OYAGAA AYOO YISSAA who wrote.

« Condolences to OEOE 95 family and relatives. His passing is not a source of sadness for us. We just wanted to celebrate his memory in a collective meditation. Is this an image of OEOE 95 in the OOMO TOA account header image? Yes. His face has been pixelated from a portrait to hide the details. However it is clearly recognizable. Is the woman near the monolith the head of the mission on OYAGAA? No, this is a nice representative character without specific gender.



FIGURE 1D BIS: OOMO TOA, Little Ummite boy, 12 years old. Boy or girl? he looks like a girl or a transsexual, he/she is too cute, little jewel of the evolution with the face of angel, I kiss you.



In D1378 you explain that you will only intervene before the total collapse and self-destruction of the earth (plasma, nuclear war, etc). In this context, are your current interventions (on high frequency trading for example) aimed at postponing the final self-destruction (and the time of implementation of the D 1378 plan) or are these interventions only aimed at alleviating some of the suffering, but do not affect the underlying pace with which the earth races are moving towards partial or total destruction? We rob the robbers and let them know of the existence of an invisible operator, capable of questioning their actions. Obviously, as you know, some people on earth (far from enough) are waking up to the incredible fragility of the systems on which our so-called "modern" societies are based.

A major collapse of the banking system would cause problems in the delivery of food to supermarkets and incredible (euphemistic) disruptions would ensue. In a few hours the shelves would be empty. That's right. In the spirit of seriously preparing for such a scenario, radical life changes must be made such as reviewing our long or medium term life plans, building "communities" in the spirit of "survivalists" and in short, radically reorienting our lives in all aspects. These seem to be ideal goals, but they are now countered by international laws that normalize people's behavior based on the interests of financial markets.

That being said, due to the change in life project orientation and the impossibility of extrapolating a sufficiently precise timetable anyway, such decisions are VERY DIFFICULT to make, even if we are fully aware of the dire situation we are in.

So, I have a few questions.

Will the civil war encompass everyone in a literal sense? Which regions/countries will be the hardest hit, and which will be the least affected?

Countries that are not able to support themselves will suffer more than those that are able to provide for their minimum livelihoods in an almost self-sufficient manner.

When we think of civil war, we think of different scenarios: will there be some semblance of structure and organization? Unlikely

For example, will there be several distinct "sides" with territories on each side that retain some semblance of functionality; the distribution network still intact, and food production and distribution still more or less operational? The inhabitants of poor countries will try by all means to access the territories of their less affected neighbors.

You can already see the growing influx of immigrants who risk their lives every day in the hope of long-term survival.

Or will it be more like a dissolution of all infrastructure to the point where we literally end up in complete chaos: out of local control with gangs, power grid collapse, famines, etc.? Unfortunately it should end that way.

Before 2019 will there be a smooth economy or will there be limited precursor events (civil war and banking crisis limited to one region of the world)? The warning signs are already visible and will grow. But the collapse will be sudden, over a period of a few days.

Do you mean that we should start now, without panicking or making stupid decisions, of course, to prepare for this radical moment, in all aspects of our lives, for the events of 2019? By way of illustration. Could you advise us to slowly acclimate ourselves to the idea of moving/relocating during the years we have to prepare? Move to the countryside, grow your gardens. Plan for individual access to clean water and a minimal private energy source (wind, solar). Protect your families.»

Sébastien LABLANCHE has no more family, his mother is died, he has no wife, no children, he has been rejected everywhere the humanity of the Earth has rejected me. The advice of OYAGAA AYOY YISSAA "Protect your families" does not apply to him, he lives outside the society and the

humanity, in the hypothesis that this race would be human, because my small cat gave me more love and affection during my youth than I could have hoped the tenth, even if it was not my own. This filthy race shouldn't even exist, the Ummites were very surprised when they arrived on Earth to see life around such a hot star. The Sun is a yellow dwarf, normally too hot for life to appear. Only orange dwarfs can have planets where life is likely to appear. In astronomy, an orange main-sequence star, commonly called an orange dwarf, is a KV-type star (read "K five"), i.e. a star belonging to the main sequence (luminosity class V) of spectral type K (orange star). They are located between yellow dwarfs (similar to the Sun) and red dwarfs. They have masses on the order of 0.5 to 0.8 times that of the Sun and surface temperatures between 3900 and 5200 K.

These stars are particularly interesting for the search for extraterrestrial life because their main sequence stability time is much longer (from 18 to 34 billion years), than the 10 billion years allowed for a star like the Sun. This gives a greater chance for life to develop on a terrestrial planet orbiting such a star. K-type stars also emit less ultraviolet radiation (which can damage DNA and make it more difficult for life to emerge) than G-type stars such as the Sun. K-type stars on the main sequence are about 3 to 5 times more abundant than G-type stars on the main sequence, making it easier to find planets for these early stars.

Among the known stars of the "orange dwarf" type, we can cite 36 Ophiuchi, 40 Eridani A, 61 Cygni A and B, 70 Ophiuchi (double star composed of a yellow dwarf and an orange dwarf), Alpha Centauri B, Epsilon Eridani, Epsilon Indi, Eta Cassiopeiae, Gliese 667, HD 69830, Sigma Draconis, Sigma Ursae Majoris.

36 Ophiuchi (abbreviated as 36 Oph) is a triple star system located approximately 19.5 light-years from Earth in the constellation Ophiuchus. In Chinese astronomy, it is part of the Tianjiang asterism, representing the Milky Way itself.

36 Ophiuchi A, officially named Guniibuu, the first star in the system, is a main-sequence orange dwarf of spectral type K0, and is 81% the size of the Sun.

The second star, 36 Ophiuchi B is in all respects identical to its sister. The orbit of these stars is eccentric, when they are closest, they are 7 AU apart, and when they are farthest, 169 AU.

36 Ophiuchi C, the third star is also an orange dwarf of spectral type K5, and its size is 75% that of the Sun. Its orbit is very far from its two sisters, between 4,370 and 5,390 AU.

The orange dwarf 36 Ophiuchi B is of particular interest to us because its characteristics seem to correspond to their star ("IUMMA") described by the Ummites in their letter because anyway the Wolf 424 system cannot accommodate life.

Indeed, Wolf 424 is a stellar system composed of two red dwarfs (Wolf 424 A and Wolf 424 B), located in the constellation of Virgo, 14.3 light years from Earth. They are in elliptical orbits varying between 2.6 and 4.2 AU apart, over a period of 16.2 years.

Although relatively close, this stellar system is completely invisible to the naked eye, because these red dwarfs are, in fact, very faint: their luminosity is equal to  $14/100,000^e$  of that of the Sun, or 0.014%. It was not discovered until the modern era, in 1919, by Maximilian Franz Joseph Wolf.

The radial speed of Wolf 424 is 2 km/s.

Wolf 424 is more or less famous in the ufological community because of its connection with the Ummo affair. However, this system is not likely to harbor an advanced extraterrestrial civilization, or even life, on one of its hypothetical planets; because these stars are red dwarfs, whose minor member (Wolf 424 B) is of the eruptive type. Red dwarfs are stars too small to support life, so the Ummites chose this star so as not to be taken seriously by giving an unbelievable star system.

Suspected for a long time of having fabricated the Ummite letters, José Luis Jordán Peña, presenting himself as the initiator of the affair, admitted in 1992 that it was a deception which he had continued

for 25 years. In 1992, he exposed to the police the details of the fraud which he had carried out for 25 years. By means of a phonosymbolism (the Spanish term humo means "smoke"), he wanted to suggest the falsity of its content:

«"UMMO" evokes smoke. I randomly chose the star Wolf 424. Since my real goal was not to develop a believable extraplanetary world. [...]

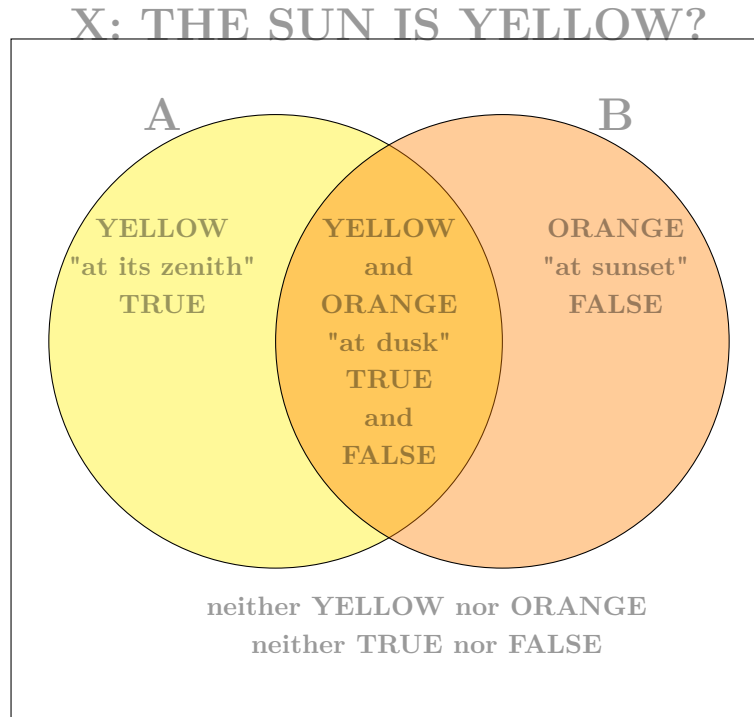
I remember that I wrote the reports on Saturday and Sunday afternoons, and I took advantage of my trips to France, England, Mozambique, etc., or those of friends, to send the letters from there. [...] We use the model attached to a very thin nylon thread. I remember that we use a very fast 1/1000 speed so that the saucer and the background of the photo come out at more or less the same focus, and the saucer looks bigger. The most incredible thing is that I ended up interviewing people who said they had seen the saucer, but who were not paid by me. [...] I became indignant when I saw that the Edelweiss sect was branding innocent children with my symbol. And then I received an anonymous invitation from Cuba, to attend I don't know what Ummite meeting at Farriols, so I decided to end the experience that had lasted 25 years. [...] I repent of having created an experiment, which I consider immoral, which turned against me. »

Eighteen years later, in a letter addressed to Ignacio Darnaude and posted on November 5, 2010, José Luis Jordán Peña provides new clarifications on the case. This would be his work, but not entirely: jokers imitating his style are the authors of certain writings and letters. He also specifies that collaborators (for example Vicente Ortuno, Norman West, John Child, M. Carrascosa, Alberto Borrás, T. Pastrami, Sean O'Connelly, Iker J.) sent letters from distant places and that he created the fictional character of John Axee to better disseminate his knowledge. He reports that he was initially contacted by two American doctors (he previously claimed that they were CIA agents) working for a foreign organization who offered him, for a salary, to carry out a sociological experiment in the interest of of Western culture, which he had accepted.

In fact, these American doctors had a physical appearance close to the Scandinavians and were like Danish doctors at the Madrid typist who typed the first Ummite letters on a typewriter (dating from the 1960s), this had been confirmed by the work of Jimmy Guieu died in the year 2000 and it was even Jimmy who said that all UFO cases carried the germ of self-destruction, taking for example the George Adamski case known because he claimed to have been contacted by extra-terrestrials named Venusians coming from the planet Venus, at the time, we did not yet know what temperature reigned on Venus but we knew that the planet was too close to the sun to host life. In the UMMO affair, the germ of self-destruction, it is the voluntary choice of the Ummite expeditionaries to give a star system which the astronomers could easily deduce that it can't be the cocoon of an extra-terrestrial life (evolved). NO NEED for that, to know how to detect potential exo-planet, because a red dwarf cannot have a habitable planet and even less an eruptive red dwarf. The "Venusians" were extra-terrestrials who manipulated George Adamski with Venus, and the Ummites manipulated Peña and Sesma (originally with Wolf 424). Terrestrial human manipulation is impossible because a hoax does not last 50 years. All these people died and the Ummites will never go to their graves, they used them as puppets.

The sun is a yellow dwarf, life should not have appeared, there was an external intervention of an intelligent race whose action allowed the appearance of life. I think the Ummites know this, it means that this Earthly has no legitimacy. The tetravalent logic is difficult to perceive for a basic human mind, it is necessary to find examples which make it possible to highlight it. At dawn, the Sun is adorned with orange colors; at the zenith, it often shines bright yellow; and at dusk it usually sports yellow-orange hues. It would be tempting then to think that the light that the Sun emits is naturally composed of wavelengths relative to yellow and orange. However, the physical reality

behind sunlight is not so simple. According to Christopher Baird, a physicist at West Texas A & M University, the entire Sun and all of its layers shine. The color of the Sun refers to the spectrum of colors present in its light, which results from a complex interplay of all parts of the star. If we are trying to determine what color the Sun is, we must study the Sun's rays on Earth and quantify them.



The statement "THE SUN IS YELLOW" is TRUE when the sun is at its zenith, but at dusk the color of the sun is YELLOW and ORANGE, so the statement is FALSE (ORANGE) and TRUE (YELLOW); Why at the same time? because the two colors correspond to the same original wavelength of the roots of the sun, but this ray will be transformed by the terrestrial atmosphere in two different ways, which leads to two different arrival wavelength on my retina and therefore two distinct colors. So the starting assertion "THE SUN IS YELLOW" is TRUE and FALSE at the same time, it corresponds to the Venn diagram below. The yellow circle set A (TRUE/YELLOW COLOR) on the Venn diagram represents all wavelengths of sunlight corresponding to YELLOW on my retina. The orange circle set B (FALSE/ORANGE COLOR) represents all wavelengths of sunlight corresponding to ORANGE on my retina. The intersection  $A \cap B$  is not empty because it corresponds to the solar rays which are yellow and orange because the light rays emitted by the sun at dusk are yellow and orange, they are the same light rays but when they arrive on my retina, they are yellow and orange.

In the tetravalent logic, there are 4 possibilities:

- TRUE (YELLOW,  $Y=Y$ ), the set  $A \setminus (A \cap B)$ ;
- FALSE (ORANGE,  $O=O$ ), the set  $B \setminus (A \cap B)$ ;

- TRUE and FALSE (YELLOW and ORANGE) ( $Y \neq O$  or  $O \neq Y$ ), the set  $A \cap B$ ;
- neither TRUE nor FALSE ( $Y \neq Y$  and  $O \neq O$ ) i.e. here neither YELLOW nor ORANGE, the set  $X \setminus (A \cup B)$ ;

The set  $X \setminus (A \cup B)$  correspond to light rays neither YELLOW nor ORANGE, this means that the color YELLOW (TRUE) no longer has any meaning, and the color ORANGE no longer has any meaning either (FALSE). The statement "THE SUN IS YELLOW" is true outside the universe.

The orange and red colors of sunsets are intensified by pollution, as well as by the ash and smoke released by fires or volcanic eruptions. In the tropics, sunsets are very short because the sun follows a path almost perpendicular to the horizon.

On FIGURE 1D, behind the depixelated face of the deceased OEOE 95, the atmosphere of UMMO has a reddish and pink color, we also learn thanks to the last tweets that the atmosphere of UMMO is much thicker than that of the Earth. Diffusion and suspended water vapor absorb short wavelengths.

Atmospheric composition of UMMO measured at the universal laboratory of atmospheric techniques dimension 878 of "WALIOA".

Nitrogen: 65.9%

Dioxygen: 23.0%

Argon: 3.7%

Krypton: 3.1%

Carbon dioxide: 1.8%

Water vapor: 1%

Helium and Dihydrogen: 0.5% and 0.1% (transported from upper layers)

Neon: 0.32%

Xenon: 0.20%

Methane: 0.02%

For comparison, composition of the Earth's atmosphere: Volumetric composition

Dinitrogen (N<sub>2</sub>): 78.084%

Dioxygen (O<sub>2</sub>): 20.953%

Argon (Ar): 0.9340%

Carbon dioxide (CO<sub>2</sub>): 0.0404% (404 ppmv)

Neon (Ne): 18.18 ppmv

Helium (He): 5.24 ppmv

Methane (CH<sub>4</sub>): 1.745 ppmv

Krypton (Kr): 1.14 ppmv

Dihydrogen (H<sub>2</sub>): 0.55 ppmv

Water vapor (H<sub>2</sub>O): from < 0.5% to 5% (highly variable)

«Our sunsets color the sky with a beautiful red and pink, decorated with occasional green waves of magnetic auroras. The average equatorial atmospheric pressure at a temperature of 12°C is 267070 Pa. It varies from 239050 to 311100 Pa» (to compare Earth's atmospheric pressure: 101320 Pa (1013.2 hPa or millibars)). To make a quick summary, the planet UMMO is most likely Opiochi B located a little less than 20 light years from the Sun, the Sun is a much hotter yellow dwarf than Opiochi B, life can only spawn on orange dwarfs, so either the sun and Earth life is a exception in the milky way galaxy if we believe in chance, or there was an external intervention which allowed

life to appear on this accursed planet EARTH. But as Albert Einstein said: «God does not play dice». The reader will make his own opinion but we will deepen this point later.

We note with astonishment that the CO2 rate seems extreme on UMMO (Opiochi B), 45 times higher than on Earth ???? no doubt to cover their tracks, as these visitors know how to do. They have undoubtedly used an artificial intelligence to check that the information contained in their tweets and their letters preserves a part of secrecy, while nevertheless keeping an overall coherence. Although it may shock the reader, this dirty race to which he belongs is probably not the will of God, but the result of extra-terrestrial know-how which has mitigated the harmful effects of such a hot star on the appearance of life, the simple fact that Africa is the cradle of humanity is a first indicator because there are no "black people" on the other habitable planets according to the Ummites, and all the stars of the 18 alien races that visit Earth are all orange dwarfs. The Sun is an exception.

Even if the prophet Rael who founded the sect of the Raelians is perhaps an enlightened one, and that no proof can accredit his meeting of the third type, the responsibility for the appearance of life on Earth is natural can be put back in cause by some elements, as the fact according to the Ummites, there are no natural satellites like the moon around the other planets known civilizations and planets that may have harbored life. These first elements are troubling.

But we know that without the moon, we would not exist or no longer exist. This element combined with the violence of solar flares should have condemned the appearance of life on a planet of the solar system.

Claude Vorilhon claims to have had two experiences of a close encounter of the third type with extraterrestrials.

According to his description, on the evening of December 13, 1973 (thirteen days after the prohibition of automobile competitions by the Messmer government, marking the end of his AutoPop magazine), while he was walking around Puy de la Vache and the Puy de Lassolas, he claims to see a flying saucer which lands in front of him. An extraterrestrial being comes out, speaking French, and tells him that he has come to meet him and give him a message that he will have the mission of spreading in all countries.

Still according to him, he then received his name of prophet, "Rael" which would mean "messenger of the elohim". The interviews will last six days, one hour a day, and will be the subject of his first book, "The Book that Speaks the Truth", which asserts that all forms of life on Earth were created by these extraterrestrials, the Elohim, thanks to a mastery of genetic engineering and a scientific advance of twenty-five thousand years. All the many prophets the Earth has known would have been sent by the Elohim, but their messages, misunderstood and distorted by humans, would have been perverted.

Humanity was created by extraterrestrials! This theory, known as the theory of the ancient astronauts, enjoyed great editorial success in the 1960s and 1970s, and continues to this day. Sociologists and anthropologists are looking into this phenomenon.

The Frenchman (Claude Vorilhon), a sports journalist with a moving life in every sense of the word, claims to have met an extraterrestrial filled with peace about its physical features, while walking on a volcano in Auvergne, France, who invited him to a flying saucer excursion. And his interlocutor confided to him the secret of humanity: our species would have been created in a laboratory and exported to Earth 25 000 years ago. According to C. Vorilhon, better known under his pseudonym Rael, the Bible would only recapitulate this story of our origins in an allegorical way. The visionary left the interstellar vehicle charged with a double mission: to spread the messages of the elohim (a biblical plural term meaning God, literally, according to him, "those who came from heaven")

and to gather funds to build, if possible near Jerusalem, an embassy intended to welcome them by 2035. We know how far the "prophet of extraterrestrials" has come since then. The man who calls himself "half-brother of Jesus" - because he was born of the union of "an earth mother and an extraterrestrial" - claims today 55,000 followers in his "church" (in France, we speak rather of a sect) founded in Quebec in 1994. Rael made headlines in December 2002 when he claimed to have had his team perform the first human cloning in history. Its credo is based on the expression of a total freedom of thought and sex, coupled with an unconditional faith in science. One could see in the stories of this guru only the simple expression of a delirious megalomania. This would be a mistake. As the ethnologist Wiktor Stoczkowski points out, Rael is the heir to a tradition that had its moment of glory in the 1960s and 1970s. He is one of the last media-active representatives of the so-called "ancient astronaut" theory. This term encompasses a set of doctrines, stemming from several dozen works published since the early 1960s, which have in common the postulation that extraterrestrials artificially created humanity.

From angels to extraterrestrials

According to W. Stoczkowski, the idea of powers, both non-divine and non-human, creating humanity, goes back to the early days of Christianity. Gnosticism thus grouped together a set of speculative religious currents. It was located on the fringe of the Christian religion, which did not cease to fight it as a heresy. Gnosticism postulated that the God of the Bible was not the creator of our world, but simply the proud and fallible envoy of the Original Power, and that hidden truths, accessible only to the initiated, underpinned the true structure of a universe considered to be populated by various entities: angels, demons, spirits...

This breeding ground of occult beliefs, which would have lasted until our days by adopting very varied forms, was then sown in the nineteenth century, for example in 1877 and 1888, when the Russian medium Helena P. Blavatsky wrote *Isis unveiled* and then *The Secret Doctrine*. In these two works, she based herself on spiritualist revelations to describe a world created by angels, with a hitherto unknown history. The history that the inspired author was able to reveal: her talents allowed her to access the " k shic archives", an ethereal library containing all the knowledge accumulated by humanity since the dawn of time. His doctrine was taken up by many thinkers, often dissidents from the Theosophical Society. The pedagogue Rudolf Steiner, the mystic George I. Gurdjieff, Louis Pauwels' spiritual master, were among them.

From 1960 onwards, substituting extraterrestrials for angels made it possible to surf on the crest of a cosmic conceptual groundswell, to bring up to date a whole subculture that had been read, assimilated, denounced at times, venerated at others, transformed, enriched, and adapted for a century by millions of enthusiastic readers all over the planet.

Sociologist Jean-Bruno Renard has developed a brief taxonomy of believers in extraterrestrials. From statistical studies, he draws the following conclusions: "The more educated people are, the more they believe in extraterrestrials"; "belief in extraterrestrials is inversely proportional to religious practice". He concludes that this belief represents "a scientific-religious syncretism, a materialistic religion, whose deities are extraterrestrials. [The belief in extraterrestrials is [...]] the materialistic answer to this materialistic and atheistic anguish in front of silence and solitude. It comes to appease it by populating the sky emptied of God and his angels with new deities. "We are not alone," read the poster of the film *Encounter of the Third Kind*." According to him, the descriptions of extraterrestrials from groups of believers see the return of revealing qualifiers: they are "superior" to us on all levels - physical, mental, spiritual, scientific... They have all the characteristics of celestial deities, being at the same time transcendent (they created us), omniscient (their telepathy is frequently mentioned), perfect (they are very beautiful, have mental powers, master an advanced

science...), and possibly redeeming (some theses attribute to them the intention to bring salvation to humanity). "Like God, they rarely manifest themselves, leave signs and remain hidden."

The theory of ancient astronauts, after reaching the peak of its editorial wave in 1974, seems to persist in modern Western cultures. Polls conducted in 1986, 1993 and 1997 estimate that about 20% of French people "believe" in the passage of extraterrestrials to Earth (without distinguishing between time periods: the questions do not separate prehistoric times from the contemporary period, which has seen the emergence of the concept of flying saucers since 1947, the date of the first observations). It is interesting to note that the 1997 study, the only one to attempt to distinguish between believers and sympathizers, found, to the question "Do you think that the phenomenon of extraterrestrial visits to Earth exists?", 7% of answers "certainly", 18% "probably", 25% "probably not", 49% "certainly not" (and 1% "do not know"). Similar surveys, conducted in the United States at the same time, find significantly higher rates of support (nearly a third of the population seems to give some credence to the former astronaut theory). However, no study has been conducted to determine who precisely adheres to this theory. The few sociologists who have worked on this subject only infer that its supporters are mainly recruited in educated circles, forming a subculture that they paradoxically qualify as "popular".

The best known epigone of the ancient astronaut theory is Erich von Däniken, a Swiss hotel manager who published a book in Germany in 1968 entitled *Memories of the Future*, in which he defended the thesis according to which extraterrestrials came to our planet several times in order to provoke the emergence of a conscious humanity through genetic mutations. All the mythologies of the world, as long as one knows how to decipher them, would provide the keys to this hidden truth. And a squad of archaeological vestiges - some invented from scratch by previous authors and mentioned without verification or attribution of the source - would corroborate this theory. For the monuments whose existence is attested, their meaning would have been systematically distorted by the official archaeology. The gigantic drawings traced on the ground by the Amerindians of Nazca become then tracks of landing for spaceships; an anthropomorphic motive sketched in the prehistory on the walls of a cave of the Sahara hides a scuba diver of beyond space; the Egyptian pyramids - far too ambitious for humans lost in the Bronze Age - are buildings constructed by these creatures; as for the biblical account of Ezekiel's vision, which narrates the appearance of four angels, it only clumsily describes an encounter with extraterrestrial entities.

E. von Däniken went on to sell several tens of millions of books, including all editions, updates and translations! The success of his theory, the "Dänikenitis" to use W. Stoczkowski's expression, was only the most visible symptom of what rationalists are accustomed to calling a veritable epidemic of thought. For the Swiss hotelier was not, far from it, the only representative of this theory. Before him, the Frenchmen Robert Charroux, Jacques Bergier and L. Pauwels had been its spokesmen with relative editorial success. Given the similarity of the arguments put forward on both sides of the Rhine, one may suspect, if not plagiarism, at least the sharing of ideas on a very large scale. It would fill an encyclopedia to list all the "proofs" accumulated by E. von Däniken, his predecessors and their numerous emulators, as well as all the counter-attacks written by a host of scientists and rationalists allergic to this theory. Certainly, the historians have some ideas on the way in which the Egyptians came all alone to end their titanic pyramids; the archaeologists estimate that the Nazcaens were able, by surveying, to trace colossal figures on the ground without resorting to the aerial observation; the anthropologists and prehistorians multiply the hypotheses relative to the motives of the decorated caves; and the specialists of the religions are not in shortage of theories likely to enlighten us as for the sense of the biblical texts without having recourse to the forced intervention of Martians. But criticism is useless. The theory of the ancient astronauts, even if it



gives the appearance of a scientific demonstration, proves to be invulnerable to the undermining of reason.

"What people believe is generally organized within elaborate belief systems. [Each person has a knowledge structure made up of many interdependent pieces of information and belief, and people are organized into social systems in which each person supports the belief of others within the system. An isolated belief is an inconsistent belief...]", wrote sociologist Robert Hall in 1968, called by the American government to participate in a commission of inquiry on UFOs. In the same way, W. Stoczkowski defends that the theory of the former astronauts is part of a coherent vision of the world, shared by a significant fraction of the population. He challenges the canonical interpretation of the human sciences, which see in the prosperity of this kind of dogma only the sign of a loss of influence of the official religions (sociologists often classify the so-called "saucer" groups in the category of new religious movements). He also opposes the rationalist interpretation, which postulates that our civilization would be based on science and could only sustainably convey ideas that are experimentally founded and demonstrable, relegating any other belief (such as the theory of ancient astronauts) to a subcategory labeled "periodic crisis of scientific rationality". W. Stoczkowski poses in the preamble of his book "two questions of common sense [...]: How can a man come to think like this? What is the reason for the success of a theory that this thinking has generated?"

To describe the theory of the ancient astronauts, W. Stoczkowski adopts the image of the inverted pyramid: For him, the *dänikenite* presents itself as an edifice resting on its tip (the axiom that extraterrestrials are at the origin of mankind), articulated around an architectural logic (if they have passed, traces of them remain), and spreading at its summit a large surface of visible evidence (any colossal archaeological remains, if possible located in very distant countries, and presumed then of inconceivable antiquity). Attacking the interpretation of the said evidence does not in any way bring down the structure: one does not destroy a building by undermining its top. Its foundations will remain intact even if it is demonstrated that it is possible to build one of these monuments with tools mastered by their historically presumed designers. Archaeologists could build a pyramid using mathematical, human and technical means known from the time of the pharaohs, but they would not attack the roots of the belief. They are the heritage of a community of thought, that of millions of readers who consider as possible and even probable what they can read in hundreds of widely distributed books.

J. Bergier and L. Pauwels were aware of this: "It will undoubtedly be realized [in the future] that many of our statements were delusional [...]. This is a possibility that we accept wholeheartedly. "There was a lot of nonsense in the book by Pauwels and Bergier. That's what people will say. But if it is this book that has made people want to take a closer look, we have achieved our goal. As for E. von Däniken and others, they have not deprived themselves of revising their hypotheses, discussing the veracity of the evidence, challenging their respective methods (which incidentally gives some of their debates undeniable scientific aspects) ... without ever questioning the fundamental premise of the demiurges of the stars.

Well before E. von Däniken, the authors of science fiction (SF) had described extraterrestrial creators of humanity. Fantasy literature and occultism have often borrowed themes from each other. Thus, we know novelists who switched to esoteric narratives: R. Charroux had published several fictions before tackling his *Histoire inconnue des hommes depuis cent mille ans* (Unknown History of Men for a Hundred Thousand Years); Lafayette R. Hubbard, founder of the Church of Scientology, a sect that postulates that our ancestors were deported from space in a scenario close to that of the theory of the ancient astronauts, was an author of SF... Can we deduce from this

that SF and occultism are equal in the minds of their respective readers? A priori no. If the former asserts itself as fiction, doesn't the latter present itself as depicting a reality?

Coherent mental representations

In this respect, W. Stoczkowski discerns two types of rationality: the first is "efficient", it claims to validate only the truths authenticated by a pure and hard scientific approach. It is by this yardstick that rationalists believe that theories such as that of the ancient astronauts should be evaluated. The second rationality is "circumscribed", it is that of common sense, which we use in our daily lives. Thus, if you burn your hand by putting it in the fire, you will deduce that this act is harmful and you will refrain from doing it again. If you were an advocate of efficient rationality, your reason would order you to repeat the experiment by varying the modalities before inferring any conclusion whatsoever. You would again expose your ear, then your foot to the flame, in order to be able to affirm what circumscribed rationality has already taught you: fire hurts. We can even take the reasoning a step further. In fact, if you know (or think you know, who knows?) that fire burns, it may not be because you have directly experienced it. Rather, it is because your parents taught you. You are thus the heir of a socially elaborated and shared knowledge.

It is on the basis of circumscribed rationality that our society is articulated. The efficient rationality, as for it, can ideally work only in laboratories. In the eyes of circumscribed rationality, nothing denies the possibility that extraterrestrials could have been at the origin of our species. If the borrowing of elements from SF could feed the theory of ancient astronauts, is it not simply that our cultural heritage is firing on all cylinders, perhaps through individuals who switch from one conceptual subset to another, for example from the SF universe to the occult literature? And if theories alien to science, such as that of ancient astronauts, can suddenly grow and then fade away without disappearing, it is not simply because they meet needs, by replacing official religions, by proposing a global vision of our origins, our history, our place in the universe and our destiny. If they can do all this, it is mainly because they fit into coherent mental representations.

So, is Rael a messiah or a liar? A lesson to be drawn from the study of the theory of the ancient astronauts would perhaps be that wanting to combat a thought on the grounds that it is based on presuppositions that are the opposite of those of modern science is doomed to failure. A belief lasts as long as it is shared.

In Nazca there are big drawings whose motives are discernible only by aerial view. The defenders of the theory of the ancient astronauts see there prehistoric landing strips for spaceships.

The site of Nazca, in Peru, was known since the Spanish conquest for its tracings left by an Amerindian civilization between the 5th and 10th centuries of our era. It was necessary to wait for the aerial views to detect there figures, invisible since the ground. The archaeologists wonder about the meaning of these monuments, which seem according to them more related to funeral rites, as would attest the presence of mummies, than to the visit of extraterrestrial "gods".

According to their documents, the Ummites would be the last aliens to have visited the Earth and there would be a race that has been visiting it for 10,000 years. Is it possible that an ancient alien civilization intervened tens of millions of years ago or even well before that, billions of years ago? The answer is yes, of course. But on the other hand it has probably disappeared since then. So if there was a recent intervention as Rael suggests, it means that alien DNA was imported to accelerate the evolution of humanoids. Unless there were two interventions, an upstream intervention several billion years ago to allow the formation of the atmosphere and prevent the evaporation of water related to temperatures, and a recent intervention to accelerate and direct the evolution towards SAPIENS SAPIENS. But it is also necessary to know that the Ummites are interested in the Earth because their race is biologically similar to more than 93% of the Earth's species SAPIENS

SAPIENS and yet the reproduction between "Humans" of the Earth and OUMANS (OUMAINS in French), the other term to designate the Ummites IS GENETICALLY IMPOSSIBLE. So each alien race has its own reproductive DNA, and evolution has evolved differently on different stars of the "ORANGE Dwarf" type, except for Us. The Sun star was therefore much too hot for life to appear, so the extraterrestrial intervention necessarily took place beforehand, so that the composition of the atmosphere was modified to correspond to the composition of the external race that intervened on Earth a very long time ago.

The fact that the Earth race is the only known race in this sector of the milky voice and arguably in the entire milky voice that does not grasp the power of ANGLE magnitude and speak of ANGULAR DISTANCE only to assess astronomical distances, while a distance is always angular means that this Earth race is lagging behind basic geometric concepts, which go well beyond the simple difference of mathematical convention. This confirms that the brain has been disturbed at the level of the cerebral cortex by the rays of a Too hot star.

It is the same for the tetravalent logic on which the Ummites insist a lot by arguing that the bivalent logic is insufficient to describe the functioning of the cosmos. Letter addressed to Jean Pierre Petit below (numbered NR5-1 in the nomenclature of available Ummite documents).

Mr PETIT, Jean Pierre:

We lay our hand on your noble chest.

Sir: We have studied your personality through our UAAGOOAWEE instruments (Individual Evaluators of Psychic Behavior) and we have received a strong impression by the high value that your abstract intelligence coefficient has reached there. We can tell you without any error that you are among the  $2.9 \cdot 10^{-6}$  of the most gifted men in this field on OYAAGAA (planet earth). We beg you not to believe that we are trying to flatter you (which would, on the other hand, be useless given that we do not ask you for anything in return) but on the contrary we want to encourage you to continue your speculative studies on the formal logic, which, you guessed it, is the key to understanding the Cosmos.

The "theorem" of FERMAT, of which we know that you are aware, HAS A DEMONSTRATION and it is within reach of a man of your intellectual condition. We would like to be able to help you (indirectly, of course, because your sensitivity has indeed understood that any direct intervention at OUYAGAA is morally impossible for us) to resolve it.

This would give you vis-à-vis your brothers an intellectual prestige which unfortunately you lack at present (and this is due to the aggressive incredulity of terrestrial scientists more than to your lack of merit). You must follow the thought:

$1=1$

$0=0$

$1 \neq 0$

$0 \neq 1$

and cross:

$1=0$

$0=1$

$1 \neq 1$

$0 \neq 0$

That is to say combining binary equalities / inequalities with tetravalent logic. In future letters we will let you know your progress and your mistakes.

We beg you, Sir, to be very discreet about the content of our letters; in other countries we had to cut off contact with your brothers because of their extreme indiscretion. We want to establish

two-to-one correspondence with you (we will give you instructions on how to contact us) but we ask you in return to be very discreet.

You can speak freely to your brothers:

FARRIOLS, Rafael (SPAIN)

PASTOR, Jean-Jacques (FRANCE)

JORDAN PENA, Jose-Luis (SPAIN)

But otherwise, it would be very wise of you not to tell anyone else.

A prayer:

We urge you to get in touch with:

Mr. Jose Luis Jordan Pena

77, Avenida de Bruselas

28028 Madrid-Spain.

This gentleman has a very wide knowledge of our writings, our philosophy and our science. For many years he was (and before a cruel infirmity struck him) our principal intermediary in the terrestrial country of Spain. He is now fearful and distrustful; however, we believe that your personality can gain his in no time and that your intelligence and information will be essential to help you better understand our messages. The final step would be a meeting of the two of you with a group of my brothers; then you would have definitive proof of our identity.

Peace with you, sir.

A two-page letter in French, published in Jean-Pierre Petit's book "Le mystère des Ummites"(French) /"The mystery of the Ummites"(English).

This letter is to be related to another letter in French, posted in France, received by "ummo-sciences" on 02/13/2004 classified NR-20. The number of pages is an element reserved by ummo-sciences. Ummo-sciences has a copy of the original but reserves its publication for the moment (the reason being that a word has been changed in the transcription below compared to the original (without this altering the meaning of the sentence), and this in order to identify in the future if possible authors of documents are the same authors as this letter).

Mr. Alban Nanty

My name is NABGAA 112 daughter of DORIO 34. I currently reside in Belgium and depend on my brother AYIOA 1 son of ADAA 67, chief of expeditionaries for Western Europe except Great Britain, Ireland, Portugal and Spain.

We follow with interest the discussions of your brothers on the compilation of electronic messages that you exchange publicly among yourselves about our civilization of OUMMO. We would sometimes like to answer some of your questions and are aware of having caused a feeling of frustration by voluntarily restricting the information disclosed in our correspondence with you. Please be aware that we have deliberately omitted certain information that you will have to deduce yourself. Your scientific development already allows you to do this and we notice with a smile that you sometimes touch on certain answers without submitting them to an attempt at objective validation.

The interest in tetravalent logic is meritorious and it is indeed a line of research for which you can base yourself on the theoretical developments made by your thinkers over the last decades. The enigma that our term AĪOOYAOU seems to constitute for you is caused by the indication given in our reports to your brothers that this term had no simple significant translation in your languages. It is a question of understanding well that this term is not used by us in a current way,

except by our specialists in OOLGA WOU-OUA WAAM (theoretical cosmophysics), comparable to your terrestrial astrophysicists. We sometimes use it in philosophical themes concerning, for example, the purpose of the OUAA (moral laws) in the process of conformation of our BOUAWA (soul) after the disappearance of our OEMII (body).

To approach the meaning of this term, you must return to the amazing phenomenon relating to the toric nebulae IAGGIAAYAOO, already mentioned to your brothers in the past. A sudden drop in the temperature of the gas within these nebulae indeed allows us to predict future deformations or folds in the local four-dimensional structure of our WAAM (universe) due to the interaction with our anti-universe OUWAAM. This phenomenon occurs before the apparent cause that originated it has actually occurred. It must be understood here that the measurable consequence of the distortion - the sudden drop in temperature of the gas - apparently precedes the distortion itself and in no way modulates its appearance. You would be able to interpret this phenomenon, pictorially, as a shadow projected by the wave caused in our WAAM by the clouds of imaginary matter present in OUWAAM. This shadow would thus be the reflection of an AÏOOYAOU phenomenon whose spatio-temporal amplitude and distance are uncertain, just as it would be uncertain to transcribe the three-dimensional shape and distance of an object - inaccessible to the senses and measuring instruments - from the shadow it would cast on the ground.

The analysis of the data at the time of the occurrence of this phenomenon makes it possible to refine the parameters of the mathematical model that we will inject into the SANMOO (computer) of each OAWOOLEA OUEWA OEM (spacecraft) intended to travel through the relative isodynamic conditions at the next folding. However, the model is imprecise because, if we know how to deduce with a correct approximation the amplitude of the folding, we do not know how to accurately predict the moment at which it will begin. We sometimes have to wait several months before an expedition, prepared in a few days, begins its journey.

Please excuse me for this digression but it seems to me necessary to introduce you to this term which refers to a phenomenon that can only be observed by its consequences but which itself remains partially indeterminate because it is inevitably outside our field of perception. limited and subordinated to the stochastic disturbances of the WAAM which necessarily modulate the information conveyed by the temporal flow. Also AÏOOYAOU is a term we use to describe the state of potential existence of subatomic particles subject to quantum indeterminacy. Thus the AÏOOYAA state of existence is inapplicable to electrons which evolve around atomic nuclei and of which we only know how to perceive the residual effects inside a spatio-temporal envelope predictable at the level of our measurement scales. We have also told you that the integration of the soul of your brother Sergio Vieira de Mello into your collective psyche will influence the behavior of a certain number of your brothers. This influence AÏOOYAOU because measurable psychosocial effects will logically appear in the medium term. The barbaric act and the succession of inexcusable imprudences which are at the origin of the death of this man could then be qualified as retropositive if these foreseeable psychosocial effects actually occur.

AÏOOYAOU can sometimes project itself in the classic axis AÏOOYAA / AÏOOYEE-DOO (true / false) if the actualization of the predicted phenomenon occurs or when the certainty that it will not occur is reached. If it is absolutely necessary to try to put a significance in terrestrial linguistics on this term, AÏOOYAOU would be the state of an indeterminate phenomenon whose emergence is perceptible or highly predictable but whose several updates are possible according to the different distortions inherent in the flow. temporal which could modulate its concretion. I fear, however, that this abstruse definition is a source of confusion for you.

I strongly invite you to reflect on the notion of retropositivity introduced above, unfortunately very often rejected by your brothers, which puts into perspective an act which could be qualified as negative or malicious at the time but whose long-term consequences - evaluated before its realization - would largely compensate for the trauma caused at the time of this act. This notion is crucial for us, especially in the medical and educational spheres. Equally important is the symmetrical notion of retronegativity. I also ask you to reflect on the particular aspect of this correspondence. You should only take the statements contained in this letter for what they logically are: unverifiable sentences of dubious origin, probably written by a joker. Any of your brothers would oppose the argument that you would have known how to write this letter yourself and that it contains nothing transcendent or any objective element of identification. I advise you to keep this correspondence to yourself or destroy it if you find it too disturbing. You can, if you wish, try to expose the premises exposed in this document to your brothers by letting them suppose that the idea is yours or that it was inspired by a friend.

Accept, Mr. Alban Nanty, that I place my hand against your chest as a token of respectful friendship according to the custom in force in our world.

For OUMMOAELEWE:

NABGAA 112 daughter of DORIO 34, approved by AYIOA 1 son of ADAA 67

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UMMO SYMBOL

#### APPENDIX : GENERAL CONSIDERATIONS ON OUR FORMAL TETRAVALENT REASONING

We base our tetravalent system on the formal non-acceptance of the rejection of a middle term and a third term in the dialectic. In this system what IS NOT is differentiated from the complementary of what IS. We accept that a phenomenon can both BE AND NOT BE or NOT BE AND NOT BE. It is certain that such ontological distinctions are rarely taken into consideration in everyday reality. However, they are not unknown to your thinkers and you will find the first drafts of them in the Platonic literature as well as in the founding texts of Buddhist philosophy.

Since A and B are two sets of ontological realities that can be opposed in the dialectic, this system leads to accepting the following four combinations:  $X1 = \{X \in A \cap \neg B\}$ ,  $X2 = \{X \in \neg A \cap B\}$ ,  $X3 = \{X \in A \cap B\}$ ,  $X4 = \{X \in \neg A \cap \neg B\}$ . You must translate  $\neg A$  and  $\neg B$  here as "IS NOT A" and "IS NOT B". None of the four forms of reality is the mere complement of another.

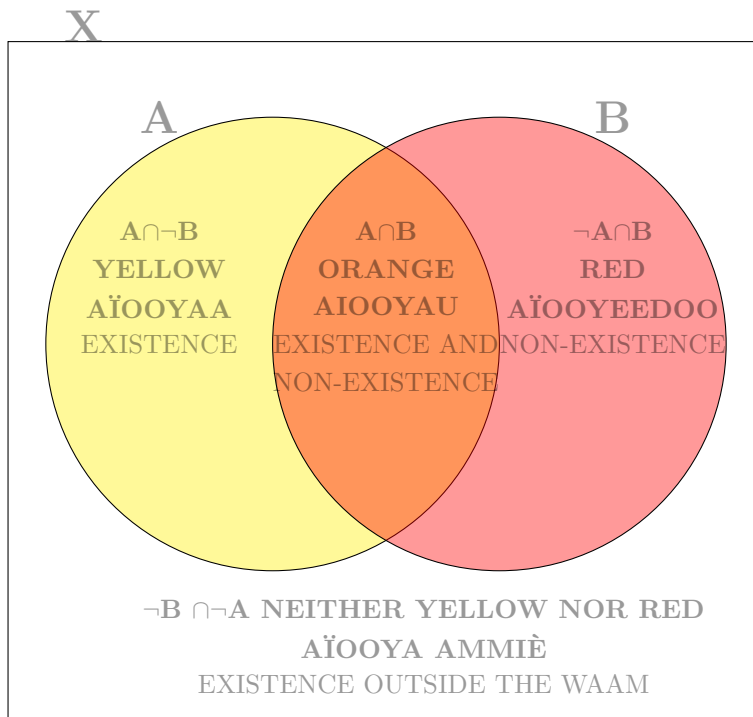
We give a simple example in the diagram below by considering the set of fundamental colors red, yellow and blue. Yellow represents then the state (A) AĪŌŌYAA (verifiable existence) and red the state (B) AĪŌŌYEEDOO (unreal; out of any verification frame). The color orange is a compound of red and yellow, the color blue is composed neither of yellow nor of red (The blue color is replaced by white color on the Venn diagram below because white color is composed neither of yellow nor of red). In this logic the complementary of AĪŌŌYAA is not AĪŌŌYEEDOO. Thus the proposition for you contradictory "X EXISTS" and "X DOES NOT EXIST" is, according to the context :

- reduced to a formal deadlock  $\emptyset : (A \cap \neg A) \text{ or } (\neg B \cap B) ;$

- reduced to a potential or partially indeterminate phenomenological reality  $(A \cap B)$ . This AĪŌŌYAOU state is well summarized in the paradox imagined by your thinker Schrödinger which leads to the deduction of two superimposed contradictory potential states due to the quantum nature of the phenomena implemented in the experiment;

- extended to an AĪŌŌYA AMMIÈ existence  $(\neg B \cap \neg A)$ , unverifiable outside an individual or collective field of consciousness. Located at this level are the intellectual processes associated with abstract concepts, or emotions of an empathetic or compassionate nature, which many of your

thinkers associate with phenomena of purely biochemical origin and which we partially externalize to the transcendent entities that are the individual soul (BOUAWA), the collective psyche (BOUAWEE BIAEII) and God (WOA).



The imprecision of your linguistic expressions obliges me here to explain that an unreal form, translated by "DOES NOT EXIST", remains in absolute a form of existence in the AÏOODI which gathers each form of existence susceptible to be envisaged by any form of thought of the WAAM-WAAM. Our limited cognitive capacity cannot define an absolute form of non-existence. We thus accept, in the course of our philosophical or mathematical developments, the appearance of elements that you would qualify as contradictory because of the possible coexistence of BEING and NOT BEING or the refutation of both. Thus, the elaboration of solutions during the formal calculation necessarily provokes divergent branches. Each of these divergences must be explored to its end in order to confirm or deny a posteriori and by logical deduction each of the ways generated by each IBOSZOO IOUBOO (point of uncertainty) of the network of possibilities thus developed. I enclose for your information the diagram opposite, without any meaning of its own, including two of these points.

Your scientists are also confronted with such classes of problems after a correctly constructed deductive process. They do not know, for example, how to cut the point of uncertainty left by the theory elaborated by your eminent thinker Albert Einstein. This theory, in fact, does not allow to decide between the three classes of cosmological models that still remain admissible for you: negative, zero or positive curvature of the tetradimensional structure of WAAM. This stage was inevitably reached on OUMMO in ancient times. To assert that the first solution is the only one which allows to explain the observations made in this WAAM would be to oblige you to a

profession of faith. You must arrive at this conclusion by discarding the other two models with indisputable proofs and, thus cutting off the point of uncertainty and thus any possible doubt, you must impregnate yourself with the fascinating properties of hyperbolic geometry in order to specify or redefine your cosmological model. Your scientists must - and this is healthy - follow to the end the intuition which inclines them to explore in priority one of the possible branches in order to develop the theory which follows from this choice. They should not, however, elevate their thought process into a doctrine as long as the point of uncertainty remains upstream and their work has not led to a definitive decision on the question.

In the course of reasoning, any branching that leads to the deduction of the value  $\emptyset$  is disqualified and reduced (cut off) at the level of the last IBOSZOO IOUBOO from which it was generated. A branch generating an uncertainty point already generated upstream is frozen until the generating node is reduced elsewhere or the other branches are reduced or also frozen - giving the problem a non-deterministic solution. The reasoning is complete when all branches lead to a singleton or an irreducible indeterminacy. Thus, the formal calculus we use is not deterministic: it can generate several non incompatible conclusions. Each IBOSZOO IOUBOO must be confronted with empirical observations to try to privilege a deductive branching. Some works whose only goal is to reduce a point of uncertainty by perfecting the predictive model sometimes occupy generations of thinkers on OUMMO. We avoid any attempt at demonstration using the principle of reduction by the absurd. This principle, still very much in force among your scientists, makes reasoning blind.

We adopt in all cases, as you do, the principle of identity or idempotence:  $X \circ X = X$ . The negation is replaced by the principle of complementarity: the result of the complementation ( $\neg$ ) is the set of possible values decreased by the complemented value.  $\neg X1/\{X1,X2,X3,X4\}=\{X2,X3,X4\}$ . Thus in binary logic, complementation defines the classical negation:  $\text{True}=\neg\text{False}/\{\text{True},\text{False}\}$  and symmetrically  $\text{False}=\neg\text{True}/\{\text{True},\text{False}\}$ . In the same way that you introduce the discrete quantities 0 and 1 into your Boolean algebra we use four basic logical values representable in this symbolic by  $\{0\wedge\neg 1, 1\wedge\neg 0, 0\wedge 1, \neg 1\wedge\neg 0\}$ . Exploring the nodal graph of a problem by formal calculus consists in obtaining a reduction to one of the two tautologies among  $\{1\wedge 1, 0\wedge 0\}$  that validate a solution or to one of the two formal deadlocks among  $\{1\wedge\neg 1, 0\wedge\neg 0\}$  that then refute the hypotheses posed at the level of the latter IBOSZOO IOUBOO.

We of course use in our reasoning a wide range of restrictive logical or causal operators that are necessary to constrain the combinatorial explosion generated during the formal computation. The variables injected in the computation are themselves linked by constraining relations specific to the treated problem.

This Ummite letter allows to deepen what designates the term AIOOYAU ( $A\cap B$ ), it is the whole of the phenomena which exist and which do not exist at the same time. The experiment of the cat of Schrödinger makes it possible to illustrate that the principle of the excluded third is insufficient to describe accurately certain phenomena in the universe, which is not envisaged in general relativity, it is for that that the Ummites say about the Works of EINSTEIN:« It is that but it is discrete ». The coexistence of two antynomic states can take place only on a discrete set: for example 0 (DEAD) and 1 (LIVING) at the same time.

Schrödinger's cat is a thought experiment imagined in 1935 by the physicist Erwin Schrödinger in order to highlight the supposed shortcomings of the Copenhagen interpretation of quantum physics, and particularly to highlight the problem of measurement.

Quantum mechanics is relatively difficult to conceive because its description of the world is based on probability amplitudes (wave functions). These wave functions can be found in linear combination, giving rise to "superposed states". However, during an operation called "measurement" the quantum



object will be found in a given state; the wave function gives the probabilities of finding the object in such or such state.

According to the Copenhagen interpretation, it is the measurement that disturbs the system and causes it to bifurcate from a superposed quantum state (an atom that is both intact and decayed, for example, but with a probability of decay within a given time interval that is perfectly determined) to a measured state. This state does not pre-exist the measurement: it is the measurement that makes it happen.

However, the notion of measurement or bifurcation does not appear explicitly or even indirectly in the quantum formalism, and attempts to bring this notion into existence run into extreme difficulties. Consequently, some physicists do not grant any physical reality to the concept of measurement or observation. For them, superposed states do not collapse or "bifurcate", and the measured state does not really exist (see for example: Hugh Everett). It is to show the paradoxical character of this position and to pose the problem in a striking way that Schrödinger imagined this thought experiment, also known as "Schrödinger's paradox".

Erwin Schrödinger imagined a thought experiment in which a cat is locked in a box with a device that kills the animal as soon as it detects the disintegration of an atom of a radioactive body; for example: a Geiger-type radioactivity detector, connected to a switch causing a hammer to break a vial of poison - Schrödinger proposed hydrocyanic acid - which can be enclosed in liquid form in a pressurized vial and vaporize, becoming a deadly gas, once the vial is broken. If the atom has a half-life of 10 minutes, then there is a 50% chance that it will have decayed after 10 minutes. Quantum mechanics indicates that, as long as the observation is not made (or more precisely, as long as there is no reduction of the wave packet), the atom is in a superposition of two equiprobable states: intact and decayed. However, the mechanism imagined by Erwin Schrödinger links the state of the cat (dead or alive) to the state of the radioactive particles, so that the cat would also be in a superposition of states (the dead state and the alive state), until the opening of the box (the observation) triggers the choice between the two states. Therefore, it is impossible to say whether the cat is dead or not after 10 minutes. The main difficulty lies in the fact that if we are generally ready to accept this kind of situation for a particle, the mind refuses to accept easily a situation that seems so unnatural when it concerns a more familiar subject like a cat.

Why Schrödinger's cat?

Schrödinger was trying to highlight the problem of the emergence of macroscopic laws (on the scale of a cat) from the laws of quantum physics. The question raised by his thought experiment is therefore not "how is it possible in the quantum world?" but "how is it impossible in the macroscopic world?"

This experiment has never been performed, because :

1. the technical conditions to preserve the superposed state of the cat are very difficult, quite unfeasible for more than a few molecules;
2. the passage to the macroscopic scale that the cat represents with respect to the few molecules is the main interest of the thought experiment (it is not a question about the living); the role of the cat would be perfectly realized by a switch ;
3. even if these conditions are reached, it is a pure thought experiment, apparently not realizable even in principle. Indeed, it will never be possible to demonstrate directly, or to measure, that the cat is both dead and alive, because trying to know its state will necessarily cause the collapse of the wave function.

In fact, the aim is mainly to make a mark: if the quantum theory allows a cat to be both dead and alive, it is either that it is wrong or that we will have to reconsider all our prejudices. In a letter dated August 8, 1935 and addressed to Schr dinger, Einstein proposes a thought experiment where a powder keg would be in a superposition of the states the keg has exploded and the keg has not yet exploded. Schr dinger answered on August 19 by replacing the barrel by a cat that a device places in a superposition of dead and alive states. From then on Einstein used a powder keg with a cat nearby. Schr dinger and Einstein thought that the possibility of the undead cat showed that Max Born's interpretation of the wave function was incomplete. The "what solution?" section shows that this situation highlights the strangeness of quantum mechanics, but does not refute it. Anecdotally, one can also wonder (as  tienne Klein does in: "Il  tait sept fois la r volution" or "Seven times the revolution") where the choice of the cat for this thought experiment comes from. Sciences et Avenir, in a special issue devoted to Schr dinger's cat, proposes the hypothesis of a reference from Schr dinger to the Cheshire cat.

Is it correct to say that the cat is dead and alive?

The statement "The cat is dead and alive" is indeed confusing, and our intuition tells us that the sentences "the cat is dead" and "the cat is alive" are each the negation of the other. In fact, in quantum mechanics, there is theoretically a third possibility: the cat can be in a superposition state, in which it cumulates several incompatible classical states.

In quantum mechanics, the state of the cat is represented by an abstract vector. If one assumes a direct dependence between the state of a particle and the life of the cat, the cat should be in such a superposed state, dead + alive, until the observation which will reduce it to a single state. If we use the bra-ket notation of Paul Dirac, in the formalism of quantum mechanics, the state of the cat could be written (by analogy with that of the particle):  $\frac{1}{\sqrt{2}}.(|died\rangle+|living\rangle)$  where  $|died\rangle$  and  $|living\rangle$  are respectively the vectors of a Hilbert space which represent the dead and living states of the cat, each of probability equal to 50%.

In quantum mechanics, a physical state is represented by a vector of a Hilbert space. The principle of superposition states that the linear combination of such vectors always represents a physical state, but does not specify the interpretation one should give to it. However, this superposition of states cannot be observed directly: here, when we observe the cat, we will see it either dead or alive. According to the postulate of measurement, the state of the cat just after the measurement will then be respectively the state  $|died\rangle$  either the state  $|living\rangle$ .

The interest of writing formally the superposed state is to be able to calculate the probability of measuring each of the outcomes of the measurement experiment thanks to the Born postulate.

There is no logical problem (if the principle of the excluded third is replaced by the tetravalent logic ) as soon as one conceives that a quantum object can have properties that contradict our everyday experience. In order to avoid the abuse of the language of the "living-dead cat" or "dead and alive", we can prefer to say that the cat is in a state where the usual categorizations (here life or death) lose their meaning.

But one can, like Einstein, refuse to admit that the cat has no definite observable state as long as one does not observe it, and assume that if one sees the cat alive, it has been alive since its confinement. Einstein anticipated Niels Bohr's objection: « The positivist mystic will retort that one cannot speculate on the state of the cat until one looks at it, on the pretext that this would not be scientific ».

There is the theory of decoherence to explain this paradox.

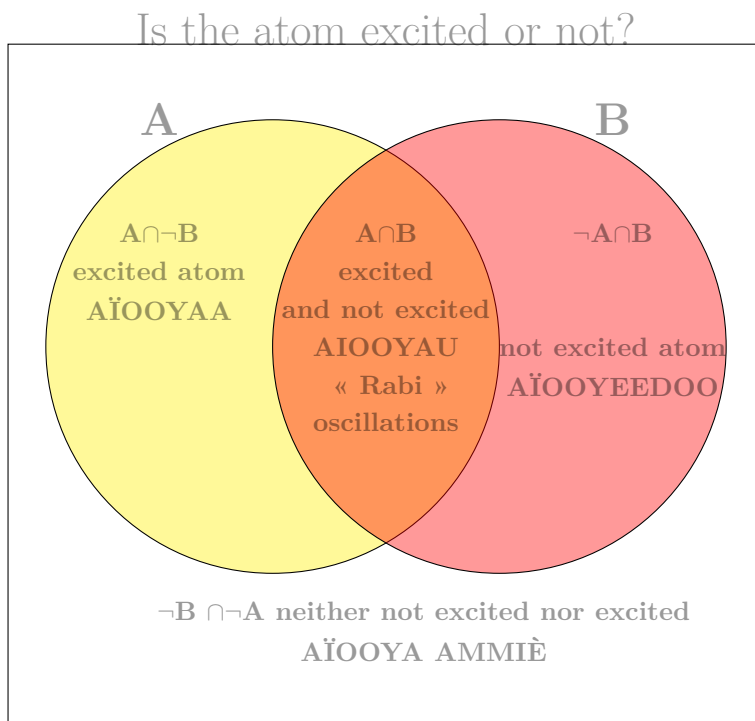
A number of quantum theorists claim that the superposition state can only be maintained in the absence of interactions with the environment that "trigger" the choice between the two states (dead

or alive). This is the theory of decoherence. The break is not caused by a "conscious" action, which we interpret as a "measure", but by physical interactions with the environment, so that coherence is broken all the faster as there are more interactions. At the macroscopic scale, that of billions of billions of particles, the break occurs almost instantaneously. In other words, the state of superposition can only be maintained for objects of very small size (a few particles). Decoherence occurs independently of the presence of an observer, or even of a measurement. There is therefore no paradox: the cat is in a determined state well before the box is opened. This theory is notably defended by the physicists Roland Omnès and Jean-Marc Lévy-Leblond, by the Nobel Prize winners Murray Gell-Mann and Serge Haroche.

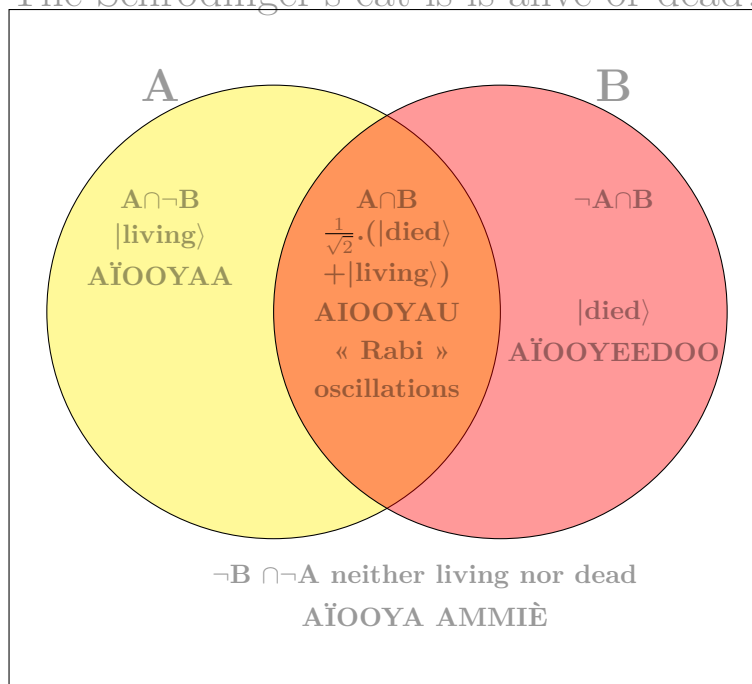
In quantum physics, an atom can be both excited and unexcited. It can also be in two positions at the same time.

This possibility of superposition of states applies to any quantum object. This possibility of superposition of states applies to any quantum object. For example to a molecule, a photon, or a spin, the small quantum magnet carried by the electron. For the atom, we characterize its excitation by energy levels: it can be excited, not excited, or both at the same time.

But if we measure it, we will only see it in one of these two states randomly. So to show that there is superposition it is necessary to be more astute, for that we send on the object an electromagnetic wave. If we set this wave to the right frequency, we observe that the atom alternates progressively between unexcited and excited. If we measure the state of the atom several times and average the results, we see so-called « Rabi » oscillations.



## The Schrödinger's cat is is alive or dead?



At the beginning, the atom can really be in a superposition of two states in the same instant (AIOOYAU). While at the end it is in one state at a time, randomly (AĪOOYEEDOO or AĪOOYAA). The transition time between these two situations is called the decoherence time. It provides important information between the quantum object and its environment, essential for quantum computing for example.

Everett's theory, sometimes called the theory of relative states, the theory of many-worlds or the theory of many-minds, is a formulation of quantum mechanics based solely on the deterministic evolution of the Schrödinger equation, which, when applied to the entire universe, governs its quantum state. It is not a theory in the strict sense, but an interpretation of quantum mechanics. Indeed, in the conventional formulation and interpretation of quantum mechanics, a quantum state can evolve fundamentally in two ways:

Process 1: discontinuous change (reduction of the wave packet) when measured by an external observer.

Process 2: continuous and deterministic change of the state of the system according to the Schrödinger equation.

Everett shows that process 2 is sufficient to recover all the predictions of the conventional formulation. However, in the absence of the wave packet reduction process, the universe is branched into a superposition of an astronomical number of separate worlds.

Schrödinger's cat paradox in Everett's interpretation of many worlds.

Here, each event is a bifurcation. The cat is both dead and alive, even before the box is opened, but the dead cat and the living cat exist in different bifurcations of the universe, which are equally real. In other words, there is a parallel universe where the cat is alive and another where the cat is dead, a bit like in the SLIDERS series.

But there are two objections to Everett's theory: an ontological objection and a probability objection.

#### Ontological objection

In the case of the Many-Worlds approach, it is necessary to know what determines the basis on which the universe divides into branches and in what way, since simultaneity does not exist at the scale of the universe. In the Schr dinger cat experiment, we imagine the universe divided into two: one in which the cat is alive and one in which the cat is dead. Now the basis of the vectors of the Hilbert space which correspond to well-defined macroscopic states (i.e. the states in which the cat is either alive or dead) has absolutely nothing special with respect to the mathematical formalism. A priori, one cannot assert that the universe would divide relatively to this basis without adding an ad hoc element to the theory, making it unattractive. This objection is also known as the preferred basis problem. Moreover, since simultaneity cannot be defined on the scale of the whole universe, the division of the whole universe is inconvenient to define, if it makes sense at all. In the case of the Many-Minds approach, the universe is not divided, but the observer is himself defined by the whole of his observations, which does not contradict common sense and eliminates any problem of action at a distance: we are not dealing with a Platonic "universe" object, but simply with the observer's knowledge of it.

#### Warning on probabilities

The point is to show how Born's rule can be deduced from the basic principles of the theory. For example, there are, by oversimplifying, two possible outcomes for the cat experiment. These two results are each realized in their own branch. It seems very tempting to think that one has in all cases a chance on two to be in the branch of the dead cat. However, quantum mechanics gives a probability of one half only in the very special case where the measurement is made at the half-life of the radioactive nucleus.

#### Solution to the ontological problem

Different approaches based on decoherence provide convincing answers to the preferred basis problem. The decoherence caused by the interaction with the environment allows to naturally select a basis in which the statistical operator of the studied system (for example, the cat) will see its non-diagonal elements tend very quickly to 0. This means that no sensible interference will be possible between the different components of the wave function decomposed in this basis. However, this basis corresponds precisely to the basis of macroscopically well defined states. In other words, it is only with respect to this basis selected by the decoherence that the wave function will make appear isomorphic structures to living and dead cats, which will then be dynamically independent (no interference).

#### Solving the Probability Problem

There are several types of approaches to the probability challenge. One of the most successful was proposed by David Wallace in the 2000s. Based on decision theory, Wallace manages to show that the only way for an agent to behave rationally in an Everettian universe is to follow the Born rule. In another approach, Hilary Greaves shows that a rational agent will have to weight the attention given to its different future copies by the coefficients determined by the Born rule.

Worlds are not fundamental entities of the theory.

As noted above, the ontological problems of Everett's theory are solved in the framework of decoherence. In this framework, **worlds are emergent structures defined relative to some basis** (the one selected by decoherence).

**This basis corresponds in fact to the setting of the fundamental constants of the universe, for example the speed of light in a vacuum is a constant in a given universe.**

**A base is a reference system where these constants are fixed at the birth of each baby universe.**

In other words, there is not, at any fundamental level, a world defined in the absolute which would divide into several copies of worlds defined in the absolute. There is not even a definite number of worlds existing at a given moment, because the way to count them is relative to the coarse graining chosen. We consider only one entity, the universe as a whole, whose state evolution is governed by the Schrödinger equation. The "worlds" are only structures emerging within this entity. The ontological proliferation characterizing Everett's theory is here a proliferation of structures, not a proliferation of "substance".

A hydrodynamic analogy could be: when one shakes the water in a pond, the equations of hydrodynamics predict the appearance of structures on the surface of the water in the form of waves, without the quantity of water increasing: in this analogy, the quantity of water in hydrodynamics corresponds to the integrated norm of the wave function of quantum mechanics, which remains constant, and the "patterns" that emerge on the surface of the water correspond to worlds. Just as the waves on the surface of the water are solutions of the hydrodynamics equations, the multiple worlds are solutions of the Schrödinger equation and are therefore not added by hand in an ad hoc manner by everettians. Current defenders of Everett's approach, Simon Saunders and David Wallace, claim to be ontic structural realism, a position according to which the ontology of physical theories is represented by the mathematical structures of their equations, a philosophical position to which Everett's interpretation leads a priori.

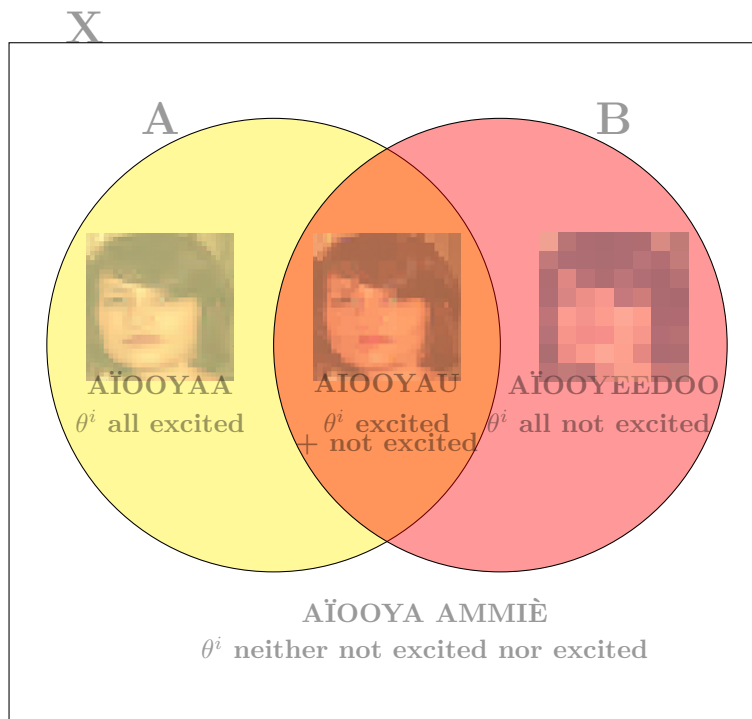
This misinterpretation is closely related to the previous one. Interpreting Everett's theory as describing worlds constantly separating irreversibly would certainly provide an arrow of time at a fundamental level. The equation governing the universal wave function, Schrödinger's equation, remains symmetrical when the time direction is reversed. This asymmetry can therefore have no meaning at the fundamental level. On the other hand, there is an emergence of a direction inherent to the tree-like structure of decoherence. This phenomenon is reminiscent of the way the arrow of time appears at the macroscopic level, with the increase of the microscopic entropy, "perfectly" reversible in statistical physics.

Everett's interpretation is not incompatible with the reversibility of the laws of physics. This error of interpretation is closely related to the previous one. Interpreting Everett's theory as describing worlds constantly separating irreversibly would certainly provide an arrow of time at a fundamental level. The equation governing the universal wave function, Schrödinger's equation, remains symmetric when the direction of time is reversed. This asymmetry can therefore have no meaning at the fundamental level. On the other hand, there is an emergence of a direction inherent to the tree-like structure of decoherence. This phenomenon is reminiscent of the way the arrow of time appears at the macroscopic level, with the increase of the microscopic entropy, "perfectly" reversible in statistical physics.

Everett's interpretation does not necessarily conflict with Occam's razor principle. There are several ways of understanding Occam's razor: in terms of ontological, conceptual or formal parsimony. In the first reading, one will limit the number of entities of the theory to the strict necessary. In the second reading, one will limit the fundamental concepts used, which one will want to be few and simple. In the third, the number of starting postulates will be as limited as possible.

Ontological parsimony characterizes current physical theories (2015) in general: the standard model of cosmology predicts, for example, the existence of an infinity of galaxies, and general relativity does not limit a priori the number of black holes in the universe. In both cases, the formation of galaxies and black holes correspond to structures specific to the dynamics of these theories:

no methodological principle in physics restricts here the number of dynamical structures to be considered. Everett's worlds as dynamical structures - not as fundamental entities - do not require ontological parsimony. On the other hand, conceptual and formal parsimony, required for the admissibility of physical theories (such as relativity, electromagnetism, the standard model of particles, etc.), are well suited to Everett's interpretation, since it reduces the number of postulates of standard quantum mechanics (the postulate of wave packet reduction is no longer needed, and Born's rule becomes a theorem and no longer an axiom, and it simply sticks as closely as possible to the formalism of quantum mechanics. Max Tegmark rephrases it by asking whether one prefers many words or many worlds i.e. if one prefers to dress up the formalism of quantum mechanics with a complex conceptual, formal and philosophical cloak in order to avoid the existence of multiple worlds, or whether one prefers to take the formalism as it is in its most purified form possible and accept the consequences.



For image depixelization, we start from a pixelated image with  $4 \times 4$  blocks and reconstruct using averaging of these blocks and successive deconvolutions. When all the angular parameters  $(L^{(i)}, \theta^{(i)})$  are excited, we arrive at the starting image, the original  $32 \times 32$  image among the  $255^{64}$  possibilities. But as the parameters  $(L^{(i)}, \theta^{(i)})$  are both excited and not excited, we have a superposition of the two states and for some of them, they will not be excited when the decoherence time is reached at the end. This is why the Ummites at first only pretended to have succeeded in reconstructing states that look like. To be able to recognize the face, it is necessary to refer only to  $(L^{(i)}, \theta^{(i)})$  pairs which will be excited at the end. The AÏOOYAU image corresponds to the « Rabi » averages of the two angular states oscillations. It is the same at the quantum level because subatomic particles behave exactly like macroscopic angles. The AÏOOYAA image corresponds to all the excited angular states

together, it is the original image and finally the AIOOYEEDOO image (pixelated image with 4x4 blocks of the same intensity) corresponds to all the non-excited angular states together. The parameter "LENGTH" of the motion blur filter  $L^{(i)}$  is also an angle  $\theta_{L^{(i)}}$  because we have already seen that a length is always angular and that length is a geometric angle as an arc of circle on the unit circle in one-to-one correspondence with the corresponding opening. The image depixelization is a set of angular excitations obtained with the right parameters chosen. The Ummites let the cat out of the bag to a person in Spain who received the last letters, explaining that they had taken out their computer in order to achieve reconstructions that resemble what can be done with computers that scan all the combinations of conditional interpolations, there are  $255^3$ . But to succeed in depixelating OEOE 95 in order to pay homage to him, perhaps the help of the other extra-terrestrial race that helps them in their mission on Earth was needed. About them, the Ummites answer: « they make things, we do not understand. If you try to dislodge us from your planet, know that we are helped by our more advanced brothers ».

$$\begin{array}{l}
 255^3 \text{ interpolation choices} \\
 \text{excited } \theta^{\hat{1}} \text{ with resize } \gamma \\
 \text{FOCUS MAGIC 4.03} \\
 \\
 \\
 \\
 i^{\text{th}} \text{ call of FOCUS MAGIC}
 \end{array}
 \begin{pmatrix}
 \text{block B2} & \text{block B3} & \text{block B4} \\
 p2^{(1)} & p3^{(1)} & p4^{(1)} \\
 255 & 255 & 255 \\
 \gamma & \theta_{L^{(1)}}^{\hat{1}} & \theta^{\hat{1}} \\
 \text{Source}^{(1)} & \text{Amount}^{(1)} & \text{Noise}^{(1)} \\
 p2^{(2)} & p3^{(2)} & p4^{(2)} \\
 255 & 255 & 255 \\
 1 & \theta_{L^{(2)}}^{\hat{2}} & \theta^{\hat{2}} \\
 \text{Source}^{(2)} & \text{Amount}^{(2)} & \text{Noise}^{(2)} \\
 p2^{(3)} & p3^{(3)} & p4^{(3)} \\
 255 & 255 & 255 \\
 1 & \theta_{L^{(3)}}^{\hat{3}} & \theta^{\hat{3}} \\
 \text{Source}^{(3)} & \text{Amount}^{(3)} & \text{Noise}^{(3)} \\
 p2^{(4)} & p3^{(4)} & p4^{(4)} \\
 \vdots & \vdots & \vdots \\
 1 & \theta_{L^{(i)}}^{\hat{i}} & \theta^{\hat{i}} \\
 \text{Source}^{(i)} & \text{Amount}^{(i)} & \text{Noise}^{(i)} \\
 p2^{(i+1)} & p3^{(i+1)} & p4^{(i+1)} \\
 255 & 255 & 255 \\
 255 & 255 & 255
 \end{pmatrix}
 \tag{1}$$

The 3 parameters  $p2^{(1)}$ ,  $p3^{(1)}$  and  $p4^{(1)}$  are natural numbers less than or equal to 255. The depixelization algorithm depends on the ability to find the unique triplet  $(p2^{(1)}, p3^{(1)}, p4^{(1)})$  that matches among the  $255^3=16581375$  possibilities, first row of the matrix shown in red. The block B2 is colored with a mean of blocks B and C only if the difference in intensities of the two blocks B and C is less than  $p2^{(1)}$ , similarly the block B3 is colored with a average of blocks B and D only if the difference in intensities of the two blocks B and D is less than  $p3^{(1)}$  and finally the block B4 is colored with a average of blocks B and E only if the difference in intensities of the two blocks B and E is less than  $p4^{(1)}$ . Otherwise the block keeps its original color, for example block B3 (FIGURE 1E). The angular sequence oscillates between the two excited and unexcited states at the same time to tend towards one of the two states. To successfully depixelize, you have to trap the pairs of angles  $(\theta_{L^{(1)}}^{\hat{1}}, \theta^{\hat{1}})$   $(\theta_{L^{(2)}}^{\hat{2}}, \theta^{\hat{2}})$ ,  $(\theta_{L^{(3)}}^{\hat{3}}, \theta^{\hat{3}})$ , ... in an excited state and interweave them



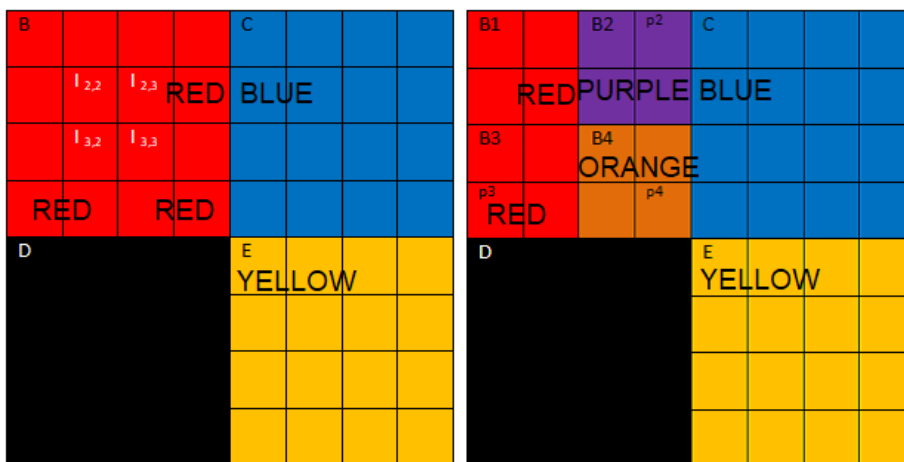


FIGURE 1E: Conditional interpolation between two adjacent blocks  
 Left: Colorization of 4x4 blocks by average of 4 central pixels  $\text{Red} = \frac{I_{2,2} + I_{2,3} + I_{3,2} + I_{3,3}}{4}$ ,  
 Right: right adjacent blocks that colorize with average of 2 blocks B2 and B4  
 (Red+Yellow=Orange for B4 bloc and Red+Blue=Purple for B2 bloc)

like a chain represented on the matrix (1). The symbol  $\hat{\phantom{x}}$  means that the angle is in an excited state. We believe that the Ummites and their extra-terrestrial friends also but more advanced have computers whose computing power is much higher than those of our current computers with an automatic integrated statistical component which allows them to test all combinations of interpolations conditions  $(p2^{(1)}, p3^{(1)}, p4^{(1)})$  between adjacent blocks, and therefore the identification of which angles are in an excited state  $(\theta_{L^{(1)}}^{\hat{1}}, \theta^{\hat{1}}), (\theta_{L^{(2)}}^{\hat{2}}, \theta^{\hat{2}}), (\theta_{L^{(3)}}^{\hat{3}}, \theta^{\hat{3}}), \dots$  is much easier. We use FOCUS MAGIC 4.03 on Earth. It is an image editing and deflowering software used by photographers and police departments as well as intelligence agencies. It allows here to test the angular parameters of the deconvolution:  $(\theta_{L^{(1)}}^{\hat{1}}, \theta^{\hat{1}}, \text{Source}^{(1)}, \text{Amount}^{(1)}, \text{Noise}^{(1)}, \dots)$ . As an example we give the matrix that represents the motion blur filter for  $\theta_{L^{(1)}}^{\hat{1}}=13$  and  $\theta^{\hat{1}}=105^\circ$  below.

$$\begin{matrix}
 \text{Matrix of 13 rows} \\
 \text{and 5 columns}
 \end{matrix}
 \left( \begin{array}{ccccc}
 0.0384 & 0.0310 & 0 & 0 & 0 \\
 0.0273 & 0.0507 & 0 & 0 & 0 \\
 0.0078 & 0.0703 & 0 & 0 & 0 \\
 0 & 0.0612 & 0.0169 & 0 & 0 \\
 0 & 0.0416 & 0.0364 & 0 & 0 \\
 0 & 0.0221 & 0.0560 & 0 & 0 \\
 0 & 0.0026 & 0.0755 & 0.0026 & 0 \\
 0 & 0 & 0.0560 & 0.0221 & 0 \\
 0 & 0 & 0.0364 & 0.0416 & 0 \\
 0 & 0 & 0.0169 & 0.0612 & 0 \\
 0 & 0 & 0 & 0.0703 & 0.0078 \\
 0 & 0 & 0 & 0.0507 & 0.0273 \\
 0 & 0 & 0 & 0.0310 & 0.0384
 \end{array} \right) \tag{2}$$

We are reduced to testing the conditional interpolation triplets by hand, which is incredibly long, with the  $\gamma$  magnification factor which also depends on the image to be depixelized. We summarize our algorithm by the following 3 steps. The first two steps are crucial because the depixelization result is determined by the first interpolation.

1. First step: Test all  $(\theta_{L^{(1)}}^{\hat{}}, \theta^{(1)}, Source^{(1)}, Amount^{(1)}, Noise^{(1)})$  motion blur deconvolution candidates and several  $\gamma$  magnification factors with interpolation triplet  $(p2^{(1)}, p3^{(1)}, p4^{(1)})$  of reference.
2. Second step: Test all 16581375 combinations  $(p2^{(1)}, p3^{(1)}, p4^{(1)})$  with  $\gamma$  and  $(\theta_{L^{(1)}}^{\hat{}}, \theta^{\hat{(1)}}, Source^{\hat{(1)}}, Amount^{\hat{(1)}}, Noise^{\hat{(1)})}$  that were found in First step.  
We test with the very simple interpolation rule:
  - The block B1 keeps the color of block B (always)
  - The block B2 takes the middle color  $(B+C)/2$  if  $|B - C| \leq p2^{(1)}$  and keeps the color B otherwise
  - The block B3 takes the average color  $(B+D)/2$  if  $|B - D| \leq p3^{(1)}$  and keeps the color B otherwise
  - The block B4 takes the average color  $(B+E)/2$  if  $|B - E| \leq p4^{(1)}$  and keeps the color B otherwise.
3. Repeat the same process for the following rows of the matrix  $(\theta_{L^{(i)}}^{\hat{}}, \theta^{(i)}, Source^{(i)}, Amount^{(i)}, Noise^{(i)}, p2^{(i)}, p3^{(i)}, p4^{(i)})$ ,  $i=2, \dots, \text{end}$ .

The memory that can store these 16581375 possible combinations would be made thanks to the TITANIUM atom Ti 22 in UMMO's quantum computers, this is what is explained in the letter D51 addressed to Mr Antonio RIBERA below.

D71 T5-33/39 Spanish flag PDF Translation JJP, AJH Last modified: 07/2020 Format checked. Scan not yet online Title of the letter: XANMMOO BAA titanium memory computers Date: ??/??/1967 To: Mr. Antonio Ribera? Original language : Spanish Notes : A letter of 7 pages. Language = SPANISH Number of copies = 1

It is not possible to make a brief summary of the physical characteristics of our (XANMMO BAA) (we could translate by computer).

Nevertheless, we can highlight the basic differences between the equipment you use and that of UMMO.

First of all, you make the difference between digital and analog computers.

Data processors store information by encoding it in a binary numbering system, which is sequenced as words or characters that reduce to "bits". The structure of the arithmetic units is designed to reduce the complexity of the circuits.

On the analogical computers of the EARTH, a series of modules suitably interconnected and with special circuits (integrators, differentiators...) interpret any physical process in the form of analogical function, but projected with electric potentials, which in summary is reduced to a series of sinusoidal functions of different amplitude, frequency and phase.

From a functional point of view, our XANMMO BAAs are simultaneously digital and analog. For example, when a problem of analytical geometry arises, the XAN ELOO (organs or output units) provide both discontinuous quantitative results (digital) supplying, for example, in ENMOO

EE, (units of area) the area of a hyperbola of revolution, as well as the graph of its equation and the visualization in 3 dimensions of its image (analog operations).

Of course the selection of the analogical equipment that intervenes in the treatment has been pre-programmed in what you would call (routines integrated in a unit of peripheral memory) although the physical process and the denominations are very different, and by an operation of digital type in base 12, these units are in turn projected in the global process.

#### OPERATIONAL BASE

It is certain that if you use electronic valves or transistors in your circuits, then you need a type of coding that you call BOOLESE of the type ALL-NONE (> | -) ZERO-ONE. The arithmetic units work with a better efficiency and a degree of reliability that you will not get by using your base 10 system.

Thus operations in the binary system such as :

$$101 + 111 = 1100$$

$$(5) + (7) = (12)$$

may require, if the numbers are large, a large number of bits to be expressed.

The IYOAEE BOO units and the XANWAABUASII (TITANIUM MEMORIES), on the other hand, can operate in real UMMO base (i.e.: 12) as we shall see.

#### "AMPLIFIER CIRCUITS" - IYOAEE BOO (COMPUTING CIRCUITS)

The voltage or current amplifying devices of the EARTH are based on the properties of the cathodic emission in vacuum, controlled by an auxiliary electrode (grid) or on the characteristics of the solid state as in the case of diodes and transistors of germanium or silicon, an ingenious invention that we did not know.

It should be noted that such circuits DO NOT AMPLIFY ENERGY, moreover, the output power is always lower than that of the input (efficiency lower than unity). They only amplify the voltage at the expense of the energy generated by an auxiliary energy source (BATTERY OR ALTERNATIVE CURRENT REDUCER).

The ODU - GOAA elements (nucleic amplifiers) have totally different characteristics:

1. FIRST: The base is not electronic (neither vacuum nor solid crystal state); it is nucleic (nucleus of the atom). A low input energy (neutrons or unitary protons falling on a few atoms) provoke by fission of the nucleus a high energy.
2. SECONDLY: We see that the yield is much higher than the unit. At the output of the elementary amplifier, we obtain this energy in THERMAL and not ELECTRIC form, although in a later process, this heat is transformed into ELECTRIC ENERGY.
3. TERTIO: The base of these elements being purely atomic (only a few units come into play instead of trillions of atoms), the degree of miniaturization is extraordinary, being able to store very complex circuits in very small volumes.

On the drawing (FIGURE 1F) you can observe the symbolic analogy between a TRIODE (D71-ideo1: amplifying valve of the Earth) and an ODU GOAA (amplifying element of UMMO).

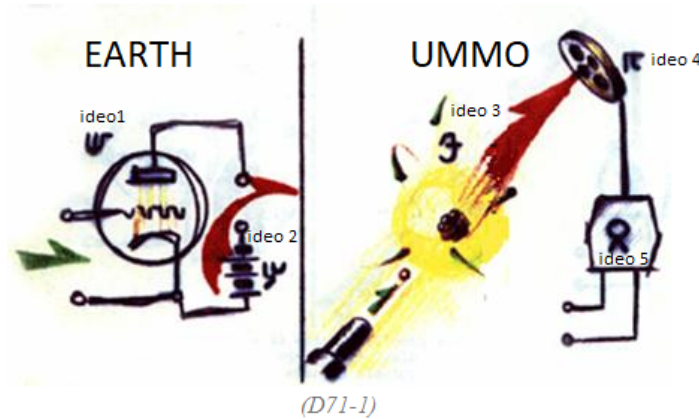


FIGURE 1F: Comparison between EARTH and UMMO Computers  
 Left: amplifying valve of the Earth (TRIODE/ELECTRONIC BASE) and Right: amplifying element of UMMO (ODU GOAA/NUCLEIC BASE)

You can observe that an input energy (green arrow) can trigger a large energy (red arrow) but only trigger it! It does not generate energy: it extracts this electrical energy from the battery (D71-ideo2).

On the contrary, in the ODU GOAA, a very weak energy (NEUTRON) (GREEN ARROW) causes a nuclear split in a single atom (D71-ideo3) whose fission releases an enormous energy (RED ARROW) captured by the AASNEII (D71-ideo4) and transformed from heat to electricity in (D71-ideo5).

In principle, this process is analogous to the one you use in nuclear reactors or atomic batteries, but it is controlled by a single atom in our GOAA ODU.

In the digital computers of the Earth, equipment called arithmetic units perform elementary operations (sums, subtractions...) at high speed using transistorized modules.

UMMO uses IYOAE BOO, based on chemo-nuclear reactions at microphysical scale instead of transistors. For this purpose we use a few hundred of these basic reactions, specifically chosen so that the simple numbers used are expressed in base-12 system.

For example: the coding of this addition: and the corresponding verification.

$$12 + 1 = 13$$

Is realized by means of this reaction. (In which perfectly controlled micromasses intervene and not trillions of atoms as if the masses in reaction were large:  $C_6^{12} + H_1^1 = N_7^{13}$ ) The result of the reaction is analyzed with great precision and coded again for further operation in sequence.

#### THE BASIC STRUCTURE OF XANWAABUASII DIIO (TITANIUM MEMORIES)

The digital computers of the EARTH generally use a central memory of magnetic cores of ferrite and various peripheral memory units, of magnetic tape, disks, drums or rods with a helical strip.

These units are able to accumulate, magnetically coded, a very limited number of "bits" (although the numbers are several million).

The access times are however very acceptable.

Let's see now in an elementary way the technical basis of our XANWAABUASII (TITANIUM data memories).

The problem arose when the old photoelectric memories (large areas of selenium whose values were stored in the form of light pulses, which were projected onto these plates and recorded in the form of electrostatically charged points) were insufficient. Insufficient (because of the great volume required for their positioning) necessary to accumulate the thousands of trillions of digits that they required, millions of OBXANWAIH (we can translate by "ROUTINES") and DIGITAL DATA of a CALCULATION program. (We have never used any magnetostatic storage) DAOO/6 (SON) of DAOO/4, projected for the first time to codify microphysically (neither optically, nor magnetically) the numerical data or CHARACTERS, with a base IBOAAYANOA (could be translated by "QUANTIC").

We know that the electron shell of an atom can become excited when the electrons reach different energy levels called quantum on EARTH. The passage from one state to another is achieved by the release or absorption of quantized energy that has a characteristic frequency. Thus an electron in a TITANIUM atom can change state in the shell by releasing an IBOAAAYA OOU (PHOTON) but in the DII0 atom (TITANIUM), as in other chemical elements, electrons can go through different states by emitting various types of IBOAAYA ODU (PHOTONS or "QUANTUMS") of various frequencies. You call this phenomenon "characteristic emission spectrum of this chemical element" which allows to identify it by spectroscopic measurement.

Thus, if we succeed in altering at will the quantum state of this electronic crust of the DII0 (TITANIUM), we can convert it into a carrier, store or accumulator of an elementary message, of a NUMBER.

If the atom is likely, for example, to reach 12 states (or more), each of these levels will symbolize or ENCODER a number from zero to twelve.

Moreover: a single TITANIUM pellet contains trillions of atoms. We can therefore imagine the coded information that it will be able to accumulate. No other MACROPHYSICAL MEMORY base can be compared to it.

The TITANIUM blocks we use must have a perfect crystal structure and a degree of chemical purity of 100% yield. It would be enough that there are some impurity atoms (iron, molybdenum, silicon...) for this block to be unusable.

You can then ask yourself: how can we access these atoms one by one to code them by exciting them or to extract the accumulated information (decoding)?

An elementary diagram or drawing (FIGURE 1G) will clarify the ideas.

On a block of TITANIUM fall three beams (symbolized in the drawing with the colors carmine, blue and green) of infinitesimal section and very high frequency, able to cross the block without affecting the nuclei of its atoms (although affecting the respective electronic layers). We use for example frequencies of the order of  $8,35 \cdot 10^{21}$  cycles/second and different for each beam (D71-ideo6 | D71-ideo7 | D71-ideo8) are the three frequency generators.

These very high frequencies fall outside the characteristic spectrum of TITANIUM because these beams considered independently are not able to excite its cortical electrons one by one.

But this does not happen when the three beams fall simultaneously on a specific ATOM (the D71-ideo9 in the drawing). Then the superposition or mixing of the three frequencies causes an effect that you have known for a very long time, called BEATING or HETERODYNE, and which results in a much lower frequency that coincides with any spectral line of TITANIUM.

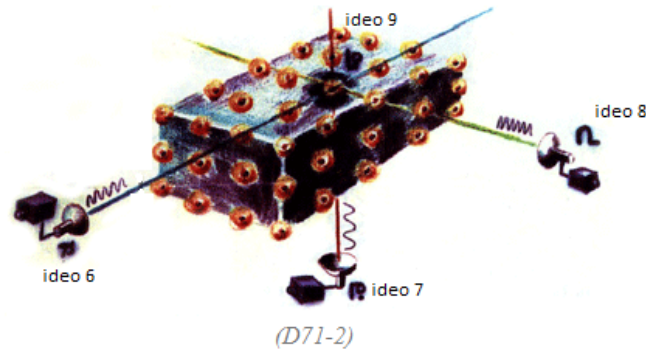


FIGURE 1G: Block of TITANIUM Ti 22

The atom is thus excited and as the three orthogonal beams can move in space with great precision, they locate all the atoms of the block, one by one.

The decoding process (which forces the electron shell to return to its initial quantum state is carried out in an inverse way).

We must make the following additional declarations because in a simplifying work we schematized the system childishly.

1°.-

In practice, we use for each TITANIUM atom only ten quantum states that correspond to the following 10 spectral lines:

323452

334902

334940

336122

337280 (expressed in

399864 LAND units)

430591

453324

453478

453558

This means that for each quantically coded number (base 12) we must excite not one, but two atoms (10 + 2).

2°.-

As once coded the atom is reduced to its initial state, unlike a toroidal ferrite nucleus which gives its information (without losing its magnetic excitation) an indefinite number of times, each coded digit is repeated hundreds and thousands of times to possess a sufficient accumulation of information.

3°.-

It is very important that the atoms in the TITANIUM crystal have a high degree of spatial stability, because any thermal oscillation would make it impossible for the three high frequency beams to locate them. The Titanium crystal works at a temperature almost equal to absolute zero. **INPUTS AND OUTPUTS IN THE XANMOO (ELECTRONIC BRAINS)**

In the digital computers of the EARTH one uses various codes of programming or intelligible

languages by heterogeneous equipment. Thus you have considered MACHINE LANGUAGES like FORTRAN, COBOL, PAF, ALGOL, UNCOL...

You introduce this coded information into the computer by means of punched cards, punched tape, magnetic tape or optical and magnetic reading of typographical characters.

The results or resolutions of the problem are obtained in digital or analog computers by means of various output equipment (cathode ray oscillographs, typewriters, tape perforators or curve plotters).

UMMO's XANMOO's directly absorb the data of the problem and the wording of the presentation (as long as the latter is well formulated) in UMMO's STANDARD language and submitted in typographical characters or in a phonic manner.

A complex pre-programming system stored in XANMOO, or even in the equipment manufacturing process, interprets the logical elements of the presentation, absorbs the typographical data and, in case of doubt, presents it using the data OUTPUT equipment.

The results are obtained by three types of GAA EIBIENEE (could be translated as image viewers) (GAA OBEE A) Printers (typography, line and gradient ink, polychrome or white and black).

(GAA DNMAAEI) Digital viewers (simple base 12 counters).

(UUEIN GAA EIMII): Three-dimensional image viewers.

We have seen the technology of the Ummites. What is the status of the technology of this filthy human earth race?

A quantum computer is the equivalent of a classical computer, except that its calculations are performed at the atomic scale. It is based on the laws of quantum physics, which deals with the behavior of matter and light at the microscopic level. The giants of technology are currently working on it.

A quantum computer uses the quantum properties of matter, such as superposition and entanglement, to perform operations on data. Unlike a classical computer based on transistors working on binary data (coded on bits, worth 0 or 1), the quantum computer works on qubits whose quantum state can have several values, or more precisely a quantum value with several simultaneous possibilities. Small quantum computers have been built since the 1990s. Until 2008, the major difficulty concerns the physical realization of the basic element: the qubit. The phenomenon of decoherence (loss of quantum effects when passing to the macroscopic scale) slows down the development of quantum computers. The first quantum processor was created in 2009 at Yale University: it consists of two qubits, each composed of a billion aluminum atoms placed on a superconducting support. This field is financially supported by several organizations, companies or governments because of the importance of the issue: at least one algorithm designed to use a quantum circuit, the Shor algorithm, would make possible many combinatorial calculations beyond the reach of a classical computer in the current state of knowledge. The possibility of breaking classical cryptographic methods is often put forward. Interest of quantum computers Moore's law estimated that the size of transistors would approach that of the atom by 2020. As early as 2015, Intel ran into unexpected difficulties causing it to delay its 5-nanometer Skylake series by six months, the first delay noted on the famous law<sup>6</sup>. Below 8 nanometers, quantum effects were supposed to disrupt the functioning of electronic components, although circuits presented as 7 nanometers are announced by Intel's competitors in 2020.

The (eventual) construction of large quantum computers (more than 300 qubits) would, according to David Deutsch, allow certain calculations to be made faster than a classical computer larger than the observable Universe itself. Quantum computers require different computational techniques of

programming, but use a lot of classical linear algebra to simultaneously condition and process sets of related data, plus a small external classical computer just to chain the operations<sup>1</sup>. Whether or not the realization of quantum computers of interesting size is possible in the long run, their first commercial future would probably not be in consumer applications: quantum computing can only handle a few inputs and few outputs, with as much complexity as desired. It is therefore not a priori very well suited to calculations whose complexity lies in combinatorics. These problems can be found in scheduling and other operational research calculations, in bioinformatics, and of course in cryptography. The small volume of input-outputs compared to the processing volume makes it possible and even indicated to use them remotely through the Internet network. Some of them are thus made available to researchers via the Amazon company. Combinatorics is the privileged field of application of future quantum computing processors. For example, it can be very difficult to find all the prime factors of a large number (e.g. of 1,000 digits). This factorization problem is difficult for an ordinary computer because of the combinatorial explosion. A quantum computing circuit could solve this problem in polynomial time, i.e. for the quantum computer, the difficulty would increase polynomially instead of exponentially.

A possible analogy is to imagine a quantum computer as a SIMD processor (graphics card, for example) whose number of pipelines would be  $2^N$  times the number  $N$  of qubits. The analogy ends there, as a quantum computer can only provide one result bit at a time (the quantum state being destroyed by the observation), after which the calculation must be restarted to request the next bit. A result of size  $2^N$  thus requires only a time in  $O(N \log(N))$ , which is considerably faster than classical combinatorics as the value of  $N$  becomes large, even if it is only of the order of a billion. In the same way that we speak of APU for a parallel processor such as a graphics card, since 2021 we see the notion of QPU appearing to designate a quantum processor.

#### Cryptography applications

Cryptanalysis would be much faster than by a classical computer, because it increases linearly (in  $N$ ) with the size  $N$  of the key, and not exponentially (in  $2N$ , for example) as with brute force, sequential or even massively parallelized methods with CUDA, or even very specialized computers. Indeed, to break an encryption based on the use of prime numbers, current computers, even parallelized, must solve this problem in a computation time that increases exponentially with the length of the key. This exponential character vanishes as soon as one passes from the binary base (current system with the bits) to a base of arbitrary and high size thanks to the qubit. The great factorization capacities would thus allow a quantum computer to break many cryptographic systems currently used, in particular most of the asymmetric encryption methods: RSA, ElGamal or Diffie-Hellman. These algorithms are used to protect web pages, email messages, and many other types of data. Breaking these protections would be a major advantage for the organization or country that succeeded, and a replay of the exploit performed to break the Enigma codes. The only way to make an algorithm such as RSA secure is to increase the size of the key according to the evolution of technologies that allow to break ever longer keys, slowing down at the same time the coding of messages on user networks. This key must be larger than the largest of the existing quantum computing circuits. However, the size of the computing resources available to the National Security Agency, for example, will obviously never be made public. The consequence is that countries or organizations wanting to protect themselves will see the cost and delay of their communications increase by several orders of magnitude, without ever knowing if this is useful, and at the cost of a heavy reorganization of communications, their cost, and their convenience. Quantum encryption means already exist commercially. They do not require a quantum computer, simply a more complex implementation than a standard encryption, but make any message interception immediately detectable by altering



its quantum state.

#### Quantum cryptography

If quantum transmissions were to become widespread in the future, they could ensure total confidentiality. Indeed, it is not possible to make an exact copy of the intricate state of a qubit: this rule is known as the no-cloning theorem. If an intermediate node tries to copy a quantum request, it will necessarily disrupt it. The sender of the request will be able to detect the possible existence of this perturbation. However, this question also raises the issue of the feasibility of repeaters.

#### Artificial intelligence

Solving tasks such as computer vision with complex object pattern recognition took a step forward in 2016-2017. Academics in California taught a D-Wave 2X computer (a 1,152-qubit processor) to learn to recognize trees from hundreds of satellite images of California, with ultimately 90% correct results, slightly more accurate than with a conventional computer.

#### Quantum and particle physics simulation

Quantum circuits are already used for simulations of quantum mechanics and particle physics, a function for which Richard Feynman had originally imagined them. They are very useful there, because quantum calculations become complex as soon as we leave a few trivial cases.

#### Financial forecasting

Quantum computers are being considered to study the stochastic nature of financial markets and to build new forecasting models. These new tools would make it possible to evaluate the distribution of results in a very large number of randomly generated scenarios.

#### Weather forecasting

Hartmut Neven of Google notes that quantum computers could help build better climate models. The UK's National Weather Service has already begun investing in these new technologies.

#### Other algorithms

Another algorithm, with a less spectacular gain, was discovered later: the quantum database search by Grover's algorithm. Instead of going through all the elements of a list to find the one that best meets a criterion (for example: searching for a person in the phone book to find his or her phone number), this algorithm uses overlay properties to make the search global. The results should be  $O(\sqrt{N})$ ,  $N$  being the number of records (and  $O$  representing the asymptotic comparison), better than a classical non-optimized database, provided that a quantum register of sufficient size for the computations is available. In 2009, Harrow, Hassidim, and Lloyd proposed an algorithm for solving linear systems with exponential gain. In December 2015, Google announced that it had implemented on a D-Wave machine the quantum simulated annealing algorithm proposed in 1994 by Finilla, Gomez, Sebenik and Doll. The implementation made is a hundred million times faster than a standard simulated annealing implementation. In summary, quantum computing circuits would add to classical computers in several types of applications: prime factor product decomposition, discrete logarithm computation, simulation of quantum physics, solving linear systems, function minimization, database searching.

#### Technical constraints

Quantum computers are very vulnerable to errors on the qubits, which requires very sophisticated corrective codes; cosmic rays seem to be sufficient to create such a quantity of errors that it is impossible to correct them all, which could make it necessary to have a large shielding to protect the machines. To quantify the number of qubits that can really be used, IBM has developed the notion of quantum volume, which depends on the topology of the circuit. The square root of this quantum volume corresponds to the number of qubits that can actually be used reliably. IBM announced its intention to double this volume every year, which corresponds to a 41.4% increase in

the number of useful qubits per year. History of quantum computers

Following the work of Rolf Landauer on the logical and physical reversibility of the computation process, Charles Bennett on the one hand, and Edward Fredkin and Tommaso Toffoli on the other, independently presented computer models that proved the practical feasibility of such computations. Logical reversibility corresponds here to the possibility of undoing one by one the logical operations carried out by applying the inverse instruction, whereas physical reversibility implies the absence of energy dissipation, and therefore the absence of operations aiming at erasing information (Landauer's principle). However, the fundamental laws of physics being reversible (the replacement of time  $t$  by its opposite  $-t$  does not substantially change the form of the equations), the connection between quantum theory and the computational process was made by Paul Benioff in 1980 when he described a computer based on quantum concepts, in particular the Hamiltonian operator. In Russia, Yuri Manin made a similar proposal but it was not relayed in the West because it was not translated. In 1981, Rolf Landauer, Edward Fredkin and Tommaso Toffoli organized the first Conference on the Physics of Computation at the Endicott House of MIT, which brought together about forty physicists, computer scientists, engineers and the curious. Richard Feynman gave a speech focusing on the idea of simulating quantum mechanics exactly, a task that was impossible for classical computers. He was soon followed by David Albert. For his part, David Deutsch, imagined in 1979 a computer based on quantum mechanics, with the aim of testing Hugh Everett's theory of multiple universes. However, his article was not published until 1985, before a second text in which Deutsch stated a problem for which quantum parallelism would ensure a certain and faster resolution than a classical computer. In 1992, David Deutsch and Richard Jozsa wrote the eponymous algorithm in response to this problem.

Feynman's idea was: "Instead of complaining that the simulation of quantum phenomena requires enormous power from our current computers, let's use the computational power of quantum phenomena to outperform our current computers.

Until the mid-1990s, physicists were divided as to the possibility of practical realization, partly because of the phenomenon of interaction of the quantum system with its environment, which causes decoherence and loss of all or part of the calculated information. But:

In 1994, Peter Shor, a researcher at AT&T, showed that it was possible to factor large numbers in a reasonable amount of time using a quantum computer. This discovery suddenly unblocked funds. The following year, Shor proposed one of the first error correction codes adapted to quantum systems ; in 1996, Lov Grover, invented an algorithm using a (theoretical) quantum computation circuit that allows to find an entry in an unsorted database in  $O(\sqrt{N})$  ;

in 1998, IBM is the first to present a quantum computer of 2 qubits;

in 1999, the IBM team uses Grover's algorithm on a 3 qubits computer, then beats this record the following year with a 5 qubits computer;

in 2001, the CEA developed a silicon chip using three Josephson nanojunctions called the quantronium: two junctions are used as qubits, the third as a measuring instrument. For qubits, these electronic circuits contain spin states in semiconductor quantum boxes. In the long term, these "solid" systems offer interesting prospects for large-scale integration ;

On December 19, 2001, IBM creates a 7-qubit quantum computer and factors the number 1539 using the Shor algorithm. These 7-qubit computers are built around chloroform molecules and their useful life does not exceed a few minutes. They are derisively called wetware;

In 2006, Seth Lloyd, professor at the Massachusetts Institute of Technology (MIT), pioneer of quantum computing and author of the book *Programming the Universe*, mentions in the August 2006 issue of the *Technology Review* (p. 24) the existence of 12-qubit quantum computers;

In April 2006, the Institute for Quantum Information Processing at the University of Ulm in Germany presented the first European three-dimensional linear microchip that traps several Ca<sup>+</sup> ionized atoms in isolation;

On February 13, 2007, the company D-Wave officially announces the realization of a solid state quantum computer of 16 qubits;

On December 14, 2007, the University of Queensland announces to work on optical quantum circuits; in April 2008, an article published in Scientific American reports a breakthrough towards a quantum computer using the fractional quantum Hall effect; In 2009, researchers at Yale University create the first rudimentary transistorized 2-qubit quantum processor, capable of executing elementary algorithms; On April 14, 2009, the company D-Wave announces a 128 qubit quantum chip 44 On June 28, 2009, the journal Nature reports the realization by a team from Yale University of a solid state quantum computing circuit that could eventually be used in a quantum computer. Each of the two qubits that make up the circuit is made up of more than a billion aluminum atoms, but these two qubits act as a single qubit that could occupy two different energy states;

In 2010, a team from the University of Bristol creates an optical quantum processor, in silicon, capable of executing Shor's algorithm;

on March 3, 2011, physicists from the University of Sherbrooke find an important new quantum algorithm<sup>49</sup>. In 2011, the most complex device was developed at the University of Innsbruck with 14 qubits;

In 2011, the company D-Wave announces the first commercialization of quantum computer the "D-Wave One". On May 25, 2011 the company Lockheed Martin buys the first "D-Wave One", then it will be NASA. in 2012, Enrique Martín-López, Anthony Laing, Thomas Lawson, Roberto Alvarez, Xiao-Qi Zhou and Jeremy L. O'Brien of the University of Bristol create an optical quantum device, capable of factoring the number 21 by executing the Shor algorithm;

in May 2013, Google launches the Quantum Artificial Intelligence Lab, hosted by NASA Ames Research Center, with a 512-qubit D-Wave quantum computer. The Universities Space Research Association (USRA) then invites researchers to participate in the project and study quantum computing, particularly for machine learning ;

In January 2014, the Washington Post revealed, on the basis of documents provided by Edward Snowden, that the NSA has a research program of 79.7 million dollars (entitled "Penetrating Hard Targets") whose goal is to develop a quantum computer, which would allow it in principle to spy on encrypted communications of companies as well as States. However, it seems unlikely that the necessary technology has been developed, or is close to being developed;

In 2014, a group of researchers from ETH Zürich, USC, Google and Microsoft conducted tests on the D-Wave Two. The researchers report being unable to measure or rule out quantum acceleration ;

In 2014, researchers at the University of New South Wales succeeded in using silicon as a shield around the qubits, making them more accurate and increasing the time they retain information. This could facilitate the construction of quantum computers in the future;

following the technical advances announced by an Australian team, Brian Snow, former technical director of the NSA, warns of the possible eventual loss of all secrecy of transmissions on the Internet;

in April 2015, IBM scientists made public two critical advances for the realization of a quantum computer. The researchers were able to simultaneously detect and measure both types of quantum errors. The researchers also developed a new quantum bit circuit design that could be used for more qubits;

in July 2015, 2 researchers claim to have found a quantum algorithm that solves the SAT problem in polynomial time;

in October 2015, researchers at the University of New South Wales built a quantum logic gate in silicon for the first time;

first quarter 2016: the journal Nature Photonics reports that researchers "from CNRS, Paris Diderot University and Paris-Sud University" are advancing a path using photons by developing a source of entangled photon pairs "15 times brighter than usual sources" ; IBM announces in the second quarter of 2016 its availability of quantum computing capabilities over the Internet;

August 2016, scientists at the University of Maryland successfully build the first reprogrammable quantum computer;

October 26, 2016, the discovery of particles similar to Majorana's fermions is announced as opening up possible new avenues for quantum computing;

in October 2016, the University of Basel described a variant of an electron-hole-based quantum computer that, instead of manipulating electron spins, uses electron holes in a low-temperature semiconductor that are much less vulnerable to decoherence. The prototype has been dubbed a "positronic" quantum computer because the quasiparticle behaves as if it has a positive electric charge ; November 7, 2016: the company Atos led by Thierry Breton launches a quantum computing simulation program so that algorithms can be developed and ready as soon as general quantum circuits become available. The computer would be simulated while waiting for this availability on Bull Sequana supercomputer (April 2016) which should reach 1 exaFLOPS, or 1018 floating operations per second ; November 22, 2016: Microsoft announces that quantum computing is now at the top of its priorities and that it sees more future for it than for PCs;

in 2016, Professor Gérard Berry, from the Collège de France, reminds us that the current D-Wave machine is not a general quantum computer, but optimized for a type of calculation called simulated annealing, which lends itself well to quantum computing. Without minimizing the significance of this achievement, he invites us to relativize for the moment any premature enthusiasm.

2017

In 2017, advances at Google, Intel, and several other research groups suggest that the realization of quantum computers with large numbers of qubits may be attainable within 4-5 years. This is made possible in part by the increased availability of funding from companies such as Google, IBM, Intel, and Microsoft for research and development of various technologies needed to create a working quantum computer.

According to Harmut Neven, head of quantum computing research at Google, his team is on track to build a 49-qubit system by the end of the year. The number of about 50 qubits is the threshold, known as quantum supremacy, beyond which no classical supercomputer would be able to handle the exponential growth in memory and communication bandwidth needed to simulate its quantum equivalent. In other words, supercomputers can currently achieve the same results as 5-20 qubit quantum computers, but at 50 qubits it becomes physically impossible.

According to Neven, 100,000-qubit systems would revolutionize the materials, chemical, and drug industries by making extremely accurate molecular models possible. A million-qubit system, whose general computing applications are still difficult to understand, would even be conceivable by 202771.

In March 2017, researchers at the University of Maryland succeeded in implementing on a programmable quantum computer a search algorithm developed 20 years earlier in 1996 by Bell Laboratories. This work paves the way for more ambitious experiments such as decrypting ; May 2017, IBM unveils new systems equipped with 16 and 17 quantum bits (qubits) of quantum volume

which represents a significant advance over the previous 5-qubit systems. On this occasion, IBM confirmed its goal of increasing its systems to 50 qubits or more in the next few years<sup>75</sup>. In particular, IBM is allowing researchers to test their algorithms on these new systems through an online service. June 2017: on June 20, Rigetti Quantum Computing Inc. opened its Fab-1 factory to produce silicon wafers for quantum computing

July 2017: on July 4, in Brussels, the ATOS QLM (Quantum Learning Machine) was launched, allowing 30 qubits to be simulated for 100,000 euros. The QLM can be extended to 40 qubits by adding flat stackable modules like pizza boxes. Their processors have no more than twenty cores, but they carry hundreds of gigabytes of RAM.

In Moscow, the same month, the world's first 51-qubit quantum simulator was presented by Mikhail Lukin and some Russian and American scientists from Harvard University under his direction. Lukin's quantum simulator is not a general-purpose quantum computer and the system is designed only to solve a specific equation that models the interactions between certain atoms.

September 2017: IBM successfully simulates the molecular structure of beryllium hydride (BeH<sub>2</sub>) accurately on a quantum computer. This work shows the usefulness of quantum computers to determine the lowest energy state (non-excited state) of molecules. This work could eventually make it possible to determine, for example, the structure and function of proteins much more quickly than today. Chemistry and medicine should benefit greatly from the development of quantum computers.

October 2017: Intel announces a 17-qubit quantum computing circuit.

November 2017: IBM succeeds in running a 50-qubit computer for 90 microseconds reaching the theoretical threshold of quantum supremacy.

in 2017: the company D-Wave announces the commercialization of a 2000-qubit quantum computer.

2018 January 2018: Intel in turn unveils a 49-qubit computer at CES 2018. March 2018: Google unveils Bristlecone, a 72-qubit quantum processor, at the American Physical Society's annual meeting in Los Angeles. July 2018: Atos unveils a 41-qubit version of its Atos Quantum Learning Machine. 2019 January 2019: IBM unveils the first "compact" 20-qubit quantum computer at CES called IBM Q System One. It represents a glass cube of 2.74 meters on a side (a volume of 20 m<sup>3</sup>). Inside, in addition to the electronic components, there is a tank of liquid helium and a whole range of cryogenic equipment that should enable the qubits to function in the conditions that are specific to them, i.e. a temperature close to absolute zero.

October 2019: Google announces that it has achieved quantum supremacy, in partnership with Nasa and the Oak Ridge National Laboratory (ORNL) using a 53-qubit computer called Sycamore. 2020

In March 2020, the Honeywell Company announces promising results using yttrium ions. June 2020: Atos delivers the QLM-E, a new quantum simulator 12 times more powerful than its previous model.

July 2020: The replacement of the notion of qubit by that of quantum volume taking into account the error rate, proposed by IBM and adopted by Honeywell, is endorsed.

December 2020: the University of Science and Technology of China claims a new record in the computing speed offered by quantum computing.

2021

July 2021: IBM improves its IBM Quantum Composer, a visual editor of quantum computing circuits that allows users to design and send their own quantum circuits in a simulator<sup>102</sup> using standard components. November 2021: IBM announces Eagle, a quantum processing circuit credited by the manufacturer<sup>104</sup> with 127 qubits, and confirms that it is working on its successors

Osprey (433 qubits) scheduled for 2022, then Condor (1121 qubits) in 2023, but without specifying how many of these qubits will be dedicated to error detection and correction. December 2021: A consultant's article suggests that the main issue is much less the sheer number of qubits than their signal-to-noise ratio for current computing needs. Current projects

Numerous projects are underway around the world to build viable qubits and to assemble them in a circuit. These researches are based on theoretical physics. The following projects seem to be progressing at an interesting pace:

1. superconducting circuits with Josephson junction, a technology on which IBM had invested for classical computing in the years 1978-1985. This technique would make it possible to envisage circuits that are sufficiently resistant to decoherence. For the moment, it only allows the coupling of two qubits at most, but research is underway to couple more qubits using a resonator and a SQUID;
2. trapped ions; this technique has allowed the system to have the most number of intricate qubits;
3. the nuclear magnetic resonance;
4. atoms from a Bose-Einstein condensate trapped in an optical lattice;
5. optical or microwave resonant cavities;
6. quantum dots: these are macroscopic systems that possess, in spite of everything, the quantum characteristics necessary for the development of a quantum computer. Such systems are sometimes called artificial atoms. This technique uses materials common in the semiconductor industry: silicon or gallium arsenide. It is subdivided into two branches: one exploiting the electric charge of qubits, the other their spin.
7. many other projects more or less advanced.

Several projects seem likely to be industrially exploited, but the basic problems remain. Research has been undertaken to realize a solid state quantum computer, like our current microprocessors. This research has led the University of Michigan to develop a quantum computing chip that can be mass-produced on existing production lines. This chip makes it possible to isolate an ion and levitate it in a confined space inside the chip.

Nobel Prize 2012

The 2012 Nobel Prize in Physics was awarded jointly to Serge Haroche and David Wineland for their joint work on the maintenance and observation of qubits.

Principle of operation of quantum computers

The operation of quantum computers is deterministic, whereas quantum mechanics is mostly known for its probabilistic aspect. A quantum computation circuit, or a memory position, could be

implemented from any particle that can have two states at the same time excited and not excited at the same time. They could be constructed from photons present in two places at the same time, or from protons and neutrons having positive, negative or considered to have both at the same time as long as they are not observed. This "fog of values" only makes sense if one can establish a calculation converging it to a deterministic state (e.g. "Yes or no, can the 432nd digit of the key be a 7?").

Ideas of quantum mechanics

Wave functions, which describe the state of a system, are derived from deterministic calculations. The source of randomness is in the act of observation itself, i.e. the measurement. Following a measurement, the quantum system settles in a classical state with a certain probability. This uncertainty can be eliminated by formulating expressions that can only be translated as yes or no (for example: "this combination is compatible with the key" / "this combination cannot be the key"). For some algorithms, it is necessary to perform the calculations several times until the answer verifies a certain property. In quantum mechanics, a particle can have multiple states simultaneously: the state of the particle is a superposition of possible states. This principle is illustrated by the metaphor of Schr dinger's cat which is, before observation, both dead and/or alive. Quantum mechanics does not account for our ignorance of the system but describes objectively its state. The particles in power (they will be only after detection) have this superposed state and it follows some unusual properties at our scale. A measurement on a quantum system would fix the system, with probabilities given by the wave function, in one of the possible states then observable by all the other observers without randomness. Everett's interpretation proposes a possible meaning of this phenomenon. A quantum computation is only of practical interest if the algorithm that drives it can force each qubit of the desired answer (i.e. the output signal of the computer), an encryption key, for example, to one of the values 0 or 1 with a probability of 1. Such algorithms, like those of Grover and Shor, exist.

What is the qubit?

The memory of a classical computer is made of bits. Each bit carries either a 1 or a 0. The machine calculates by manipulating these bits. A quantum computing circuit works on a set of qubits. A qubit can carry either a one, or a zero, or a superposition of a one and a zero (or, more exactly, it carries a phase distribution, an angle which for  $0^\circ$  makes it take the value 1, for  $90^\circ$  the value 0, and between the two the superposition of states in the proportions of the  $\sin^2$  and the  $\cos^2$  of the phase). The quantum computer calculates by manipulating these distributions. We do not have two states in all but in theory an infinity. However, this infinity can only be used according to the precision of the measurement and its error rate, which led IBM to reduce the raw number of qubits to what can be used with precision, called the quantum volume. The state of several qubits together is not only a combination of the respective states of the qubits. Indeed, if a qubit is in any superposition of states  $a|0\rangle + b|1\rangle$ , two qubits joined together are in a superposition of states  $\alpha.|00\rangle + \beta.|01\rangle + \gamma.|10\rangle + \delta.|11\rangle$  with  $|\alpha|^2 + |\beta|^2 + |\gamma|^2 + |\delta|^2 = 1$ .

This time it is a question of using the superposition of the four states for the calculation. This is why the theoretical computing power of a quantum computer doubles each time a qubit is added. With ten qubits, we have 1024 superposable states, and with  $n$  qubits,  $2^n$ .

A typical computer with three bits of memory can store only three binary digits. At a given moment, it could contain the bits "101" or another combination of the eight possible ( $2^3$ ). A quantum computing circuit with three qubits can in fact store sixteen values, assembled two by two to form eight complex numbers (complex linear combination of eight states).

Table 3

State	Amplitude	Probabilities;
000	$0.37+i0.04$	0.14
001	$0.11+i0.18$	0.04
010	$0.09+i0.31$	0.10
011	$0.30+i0.30$	0.18
100	$0.35+i0.43$	0.31
101	$0.40+i0.01$	0.16
110	$0.09+i0.12$	0.02
111	$0.15+i0.16$	0.05

It could contain this:

$$(0.37+i0.04).|000\rangle+(0.11+i0.18).|001\rangle+(0.09+i0.31).|010\rangle+(0.30+i0.30).|011\rangle \\ + (0.35+i0.43).|100\rangle+(0.40+i0.01).|101\rangle+(0.09+i0.12).|110\rangle+(0.15+i0.16).|111\rangle.$$

The sum of the probabilities is 1. If there had been  $n$  qubits, there would have been  $2^n$  states. For  $n$  around 300, there would have been more lines than atoms in the observable universe.

The first column shows all possible states for three bits (Table 3). A classical computer can carry only one of these states at a time. A quantum computer, on the other hand, can be in a superposition of these eight states at the same time. The second column shows the amplitude for each of the eight states (Table 3). These eight complex numbers are a snapshot of the content of this calculator at a given time. During the calculation, these three numbers will change and interact with each other. In this sense, a three-qubit quantum computing circuit has much more memory than a classical three-qubit computing circuit. However, it is not possible to see these three numbers directly. When the algorithm is finished, a single measurement is performed. The measurement returns a simple string of three classical bits and clears the eight complex numbers. The return string is randomly generated. The third column (Table 3) gives the probability for each of the possible strings. In this example, there is a 14% chance that the returned string is "000", 4% that it is "001", and so on. Each complex number is called an "ampere" and each probability a "square amplitude", because it is equal to  $a^2+b^2$ . The sum of the eight probabilities is equal to one. Typically, an algorithm using quantum computing will initialize all complex numbers to equal values, so all states will have the same probabilities. The list of complex numbers can be imagined as a vector with eight elements. At each step of the algorithm, the vector is modified by its product with a matrix that corresponds to a quantum operation. In practice, the randomness is eliminated by getting rid of the phase, for example by using the remarkable identity  $(a+bi)(a-bi) = a^2+b^2$ , whose result is a real number whatever the real  $a$  and  $b$  are, and whose measurement is thus not tainted by any randomness. This is what Shor's algorithm does.

Physical constraints

One could imagine using a microscopic molecule, which can contain several million protons and neutrons, as a quantum computer. This one containing several million qubits. But quantum computing requires two strong constraints from the system that carries it to be usable: it must be totally isolated from the outside world during the computation phase (this is called adiabatic



computation), as any observation or deletion of data would disrupt the process (in the same way that if one observed the atom that decides the state of the cat in Schr dinger's Cat experiment, the state of the cat would then be either dead or alive, instead of being a superposition of the two) The cat is only allowed to communicate with the outside world before (input of data) and after (reading of the results, or more exactly of the result); total thermal isolation cannot exist, but if it is maintained during the time of the calculation, it can take place without interference. This phenomenon of interference is called decoherence, it is the main obstacle to the realization of a quantum computer. The time of decoherence corresponds for a quantum system to the time during which its quantum properties are not corrupted by the environment. It must be done without any loss of information. In particular, any quantum computing circuit must be reversible. In "classical" logic circuits, some gates do not verify this property (NAND gate for example). However, some construction tricks allow to get around this difficulty by keeping additional information not directly useful. All classical gates have a quantum equivalent (see Quantum gate). There are naturally isolated quantum systems like the nuclei of some atoms. Some, like carbon 13, have angular momentum, a spin, and can give rise to different quantum states. Diamond crystals that contain isotopes of carbon-12 (diamond nuclei are composed of up to 1% carbon-13 nuclei) could theoretically store and manipulate quantum information at room temperature. A first technique consists in manipulating by laser the spin of the electrons of a nitrogen atom constituting the diamond impurities, and thus to act on the coupling between the spin of these electrons and that of the carbon 13 nuclei.

In an interview with  tienne Klein, Thierry Breton schematizes the functioning of a quantum computation as a search notice: if one is looking for someone in a room of a thousand people who is taller than 1.80 m and speaks English, he compares classical computing to the interrogation of each participant one by one by asking the questions "Are you taller than 1.80 m?" and "Do you speak English?" and noting down the numbers of those who answer "yes" to the two questions, which will take a certain time. In quantum computation, everything happens as if one launched a general call: "Can the people measuring more than 1.80 m and speaking English raise their hand?" and one has the answer almost instantaneously. Thierry Breton talks about holistic calculation and no longer sequential. What remains to be done is to develop languages that treat a set of possible values globally as a single value. For the moment, Atos is working on a kind of appropriate assembler, called AQAL (Atos Quantum Assembly Language). The name "assembler" may be misleading, since it is a language for describing processing that is, on the contrary, independent of the machine used (unlike an assembler in the classical sense, therefore), provided that it respects some of the main lines of a kind of virtual machine. Bernard Ourghanlian, technical director of Microsoft, presents the same characteristic in a similar way: "When you enter a labyrinth, you have dozens and dozens of possible paths. What a traditional computer does is explore them one by one. That's going to take some time, even if it has multiple processors, because each of the processors is running the same algorithm in parallel. With a quantum computer, the big difference is that we are able to explore all the paths at the same time. We will obviously go much faster. We can look in the APL language documentation the method of calculating prime numbers that tries (from the user's point of view) "all divisors at once". In case of implementation of primitive operations in quantum circuits, the simplicity of calculation would correspond to the simplicity of writing in APL.

Simulation of a quantum computer

Libraries for simulating quantum computation on a classical computer have multiplied since 2010. On August 11, 2000, Damian Conway created a module for the Perl language called Quantum::Superpositions that allows to simulate (by doing ordinary algorithmic behind the scenes,

of course) the operation of a quantum computing device. This module can be used to write and test, in a mock-up version with a few simulated qubits, programs written for quantum logic. The realized programs will be fully usable on a quantum computing device (if it exists one day) or a remote quantum computer by replacing the calls to the module by the calls corresponding to this local or remote device, without touching in anything the Perl program itself except for the number of qubits specified. One can then take advantage of the capabilities of a quantum computer and thus perform more complex calculations in the same time. This module is currently (2018) maintained by Steven Lembark. Massive computational parallelization enabled by a current (2017) graphics card is another possible way to simulate quantum parallelism on a small number of qubits in acceptable times. Thus, a GTX 1080 (2560 processors at 1.6 GHz) or with other APIs a Radeon Vega 64 (4096 processors at 1.6 GHz) can simulate 11 or 12 "false" qubits -  $\log_2(2560)$  - for a thousand euros and on the types of problems that lend themselves to it, in order to set up programs. The module provides Perl with two functions that globally test arrays: `any()` and `all()`. In the simulation, these functions work by iteration on the elements and thus in  $O(N)$  time. In a quantum computation, their execution time would be independent of  $N$ .

Python language

The qiskit framework allows to prepare programs using quantum data in Python and to send them for execution on a simulator or an IBM quantum computer accessible through the Web. The Q# preprocessor (Q-sharp) provides Python code calling library functions provided by Microsoft.

C language

The Debian and Ubuntu (Linux) repositories also offer via the APT package manager the C subroutine library `libquantum`, which implements the simulation of a quantum register. An interface allows to apply simple operations like the Hadamard gate. Measurements are done either (as on a real quantum computer) qubit by qubit, or for more simplicity on the whole register. Implementations of the Shor and Grover algorithms are provided as examples, as well as an interface for quantum error correction (QEC) and decoherence support. The authors are Bjorn Butscher and Hendrik Weimer.

CUDA

This type of simulation is no longer software-only, but uses the processor parallelism of a modern graphics card (e.g. in 2017 the GTX 1080, 2560 processors) with CUDA to directly simulate simultaneous computations, allowing up to 11 additional qubits to be simulated at a reasonable cost and time. The manufacturer NVidia improves in 2022 the quantum simulation software Qdiskit.

Simulation centers

By definition of the term, as long as one remains below the so-called quantum supremacy threshold, the same calculations can be performed in quantum computing and, more slowly, in digital simulation. The French group Atos proposes for this purpose what it calls its Quantum Learning Machine (QLM) simulating up to 40 qubits. Adding a qubit doubles either the cost of the machine or the computing time and memory required. This machine is characterized by a processing power not much higher than that of a server equipped with Xeon blades, but on the other hand, it has several terabytes of RAM (up to 48) in order not to slow down the calculations.

Tensorflow Quantum (TFQ)

This is a version allowing to use quantum computation in TensorFlow, an open source library for machine learning. It allows to work with Cirq and D-Wave quantum processors as well as Sycamore from Google. The set was announced on March 9, 2020.

Applications

IBM Q, the quantum division of IBM, gives some examples of applications of quantum computing,

in medicine, logistics, finance, and artificial intelligence. Shor's algorithm for decoding a public key encryption and Grover's algorithm for searching for elements in a storage space are examples of applications of quantum computing. In the same way, some numerical simulations concerned by the combinatorial explosion could benefit from a quantum computer. In the 1970's, the SNCF dedicated a classical electronic device to highly combinatorial computing. It was used to optimize bearings under constraints. It was the "Cybco C100-1024 Optimizer", which operated by wired exploration of all possible solutions, alleviating its calculations by impossibility and symmetry considerations. Since then, the solution of highly combinatorial problems by specialized circuits has been the subject of patents. In November 2008, Aram W. Harrow, Avinatan Hassidim and Seth Lloyd published a quantum method for solving systems of linear hollow matrix equations in  $O(\log(n))$  time instead of  $O(n)$ . In neural networks, the greedy learning method was reported in 2009 by D-Wave as a possible application. In the field of artificial intelligence, for automatic language processing, a text processor could model the universe associated with the subject and react to the semantics it could infer. This would also be possible with speech recognition and pattern recognition, in combination with deep learning technology. JP Morgan Chase has partnered with IBM and Samsung to study the applications of quantum computers for financial trading and risk prediction. Quantum computing brings a quantitative advantage in combinatorial matters, without bringing any in terms of the number of inputs-outputs (these remain sequential), it is essentially adapted to problems in which combinatorial calculations are important with regard to the number of outputs. This particularity makes it suitable for remote use, via Internet for example, and allows the use of bulky and cryogenically cooled systems. The following question has been raised in the literature: should the model be built on the "classical" computer and then evaluated by the quantum computer, or should all the work be left to the quantum computer, at the risk of being slower for traditional tasks? Quantum model emulators have been built to help answer this question. Operational applications are being researched for the use of NISQ (noisy intermediate scale quantum) computers.

IBM has unveiled its latest and most powerful quantum processor, which represents a major breakthrough in quantum computing. Named Eagle, the 127-qubit processor is the first of its kind to exceed 100 qubits. Shortly after unveiling the world's first 2nm etched chip, IBM has just announced that it has designed a new quantum computing chip that its executives say will allow quantum systems to start outperforming conventional computers for certain tasks within the next two years. In particular, IBM CEO Arvind Krishna said the company's new quantum platform is capable of providing solutions to complex problems that a traditional computer simply would not be able to solve. Named Eagle, the quantum processor offers no less than 127 qubits as well as several major architectural improvements over previous chips. For those who don't know, conventional computers operate using "bits" that must be either a 1 or a 0. However, in a quantum computer, information is represented by a quantum bit, or qubit, which can be placed in a quantum state in which it can represent a zero and a one simultaneously.

IBM is confident that it will be able to increase the number of qubits to 433 by next year and break the 1000-qubit barrier by 2023. Increasing the number of qubits in a quantum computer allows very sophisticated programs to run that would not be able to run on a standard supercomputer. With 1121 qubits, IBM hopes to gain a quantum advantage over conventional computing solutions to be able to solve real-world problems. Already in 2019, Google claimed to have achieved quantum supremacy, meaning that the company was able to outperform classical computers on a very specific workload, but IBM's computers could solve a multitude of different problems themselves. Indeed, quantum computers could soon help us design better batteries for electric cars, create more

carbon-efficient fertilizers or develop more effective drugs in a short time. France is also betting heavily on this technology, as it launched its quantum plan earlier this year. This is a 1.8 billion euro investment over five years that aims to stimulate the quantum computing industry in our country.

In 2021, researchers at the University of Science and Technology of China claim that their 66-qubit quantum computer named Zuchongzhi 2 is 1 million times faster than Google's Sycamore and 10 million times faster than the world's most powerful supercomputer. A real breakthrough in the field of quantum computing. To test their machine, the scientists calculated the probability that a certain input pattern would lead to a particular output pattern. However, these circuits have dozens of inputs and outputs, making the task impossible for a classical computer, but not for a quantum computer. «We estimate that the sampling task accomplished by Zuchongzhi in about 1.2 hours would take the most powerful supercomputer at least eight years. Our work establishes an unambiguous quantum computing advantage that is infeasible for classical computing in a reasonable time. The high-precision programmable quantum computing platform opens a new door to explore new many-body phenomena and implement complex quantum algorithms,» the researchers write.

The letter sent to Mr Antonio Ribeira described above dates from 1967; at a time when computers were the size of an entire room. The computers of that time were very far from those of today, as they started to get thinner in the early 1990s. So the latest discoveries of this dirty human race should go in the direction of quantum computers whose memory uses the interactions between Titanium atoms.

At the end of 2021, Dutch and German researchers have intercepted a "conversation" between two atoms, which could have interesting implications for research in the field of quantum computing. Atoms don't actually talk, but they interact through a property called spin. According to the team leader behind the study, Sander Otte of Delft University of Technology (TU Delft) in the Netherlands:

«These spins influence each other, just like the needles of a compass do when you bring them together.

If you give one of them an impulse, they start moving together in a very specific way. But according to the laws of quantum mechanics, each spin can point in several directions simultaneously, forming a superposition. This means that an actual transfer of quantum information takes place between the atoms, like a kind of conversation ».

In their study (link below), Otte and his fellow researchers used a scanning tunneling microscope to place two titanium atoms very close together, one millionth of a millimeter apart. They then rotated one atom to see what the other would do.

But the traditional technique for doing this, spin resonance, which uses precise radio signals to spin the atom, would have been too slow to make the desired observations.

Lead author Lukas Veldman, also of Delft University of Technology, said:

« You have barely started spinning one spin when the other starts spinning with you. That way, you can never study what happens when you put the two spins in opposite directions. »

Instead, they used a burst of electric current to squash electrons into an atom and reverse its spin, resulting in a quantum interaction.

According to Sander Otte:

« We always assumed that during this process, the delicate quantum information, the so-called coherence, was lost (quantum decoherence), with the chaos of the electrons transferring to the spin.»

But the results suggest that any random electron could initiate a coherent superposition and allow information exchange.

According to Markus Ternes of the Technical University of Rhineland-Westphalia and the Juliers Research Center in Germany, co-author of the study:

« For this to happen, it is essential that the two spins become entangled: a special quantum state in which they share more information about each other than is classically possible. »

This research could therefore have applications for quantum computers, which encode information in qubits, capable not only of representing a 0 or a 1, but also of achieving a mixed state of coherent superposition, which is the key to the power of quantum computing.

The next step is to examine the chatter between even more atoms.

According to Veldman:

« Here we used two atoms, but what happens when you use three? Or ten, or a thousand? No one can predict this, because the computing power is insufficient for such numbers. Maybe one day we will be able to listen to quantum conversations that no one has ever been able to hear before. »

The study published in *Science*: Free coherent evolution of a coupled atomic spin system initialized by electron scattering and presented on the website of the Juliers Research Center: Quantum Experiment in Science Raises Questions.

During this experiment, this scientific team was therefore able to observe the process of quantum entanglement through the period of time during which this process takes place. This is like observing a message-by-message discussion.

When two atoms are "entangled" in quantum mechanics, this means that their spins, an internal property of particles (like mass), are interdependent. This means that they influence each other, they are linked even at a distance: each action on one generates an action on the other, like the needles of two compasses that you would place next to each other.

Through the direction that the spin takes, the entangled (or "entangled") atoms are in constant conversation, in the sense that information constantly flows between them and with coherence. It's a bit like chatting with someone while being on the same wavelength all the time: you know in advance that the person will answer you "I love it" when you ask them what they think of his favorite dish. With entangled atoms, this predictability is verified throughout the discussion.

The behavior of materials depends on this process. "You could think of it as a giant group chat in which atoms are constantly exchanging quantum information," explain physicists behind a study published in *Science* on May 28, 2021 (PDF version). In their experiment, these scientists succeeded in intercepting this conversation between two atoms, an important step in understanding how these information exchanges work.

We pierce the indiscretions at the heart of the intimacy of atoms. To observe the phenomenon, the team of physicists used a very direct method consisting in placing two **Titanium atoms** within a scanning tunneling microscope, within which a probe in the form of a tip makes it possible to measure the atoms in real time. , one by one, and even to influence them by electrical impulses. The choice of titanium atoms is explained by the simplicity of their spin: it can only go in two directions, up or down, which is practical for the experiment. The two atoms were only one nanometer apart. The physicists emitted an impulse to one of the atoms, which suddenly reversed its spin, placing it in the opposite direction from its original position. Result ? The quantum interaction took place, the other atom reacted, and the scientists could watch the entanglement occur over time — that is, within 5 nanoseconds (15 billionths of a second ) that this process took. It is rare for physicists to be able to observe in detail the reaction that occurs when the spin of two entangled atoms is suddenly reversed. But, thanks to the original technique they used here, they were able to

observe it. It's a bit like, in the hubbub of discussions in a restaurant, you can zoom in on a specific exchange between two people and listen to each sentence exchanged. The experience is all the more interesting in that it brings some elements to the specificities of the quantum world. The electrical discharge should, normally, create chaos, not coherence. The electrons that reach the atom have no particular coherence, and this inconsistency should be transferred to the spin of the atom. «We always assumed that during this process the delicate quantum information – the famous coherence – was lost. After all, electrons are incoherent.» The quantum memory should then be erased by the electrical impulse. «But from the point of view of the combined system comprising the two atoms, the resulting situation is not at all so trivial,» explain the physicists. The entanglement continues. «For the two atoms together, the new state constitutes a perfect superposition, allowing the exchange of information between them. For this to happen, it is essential that the two spins become entangled: a particular quantum state in which they share more information about each other than is classically possible.» This type of research brings new knowledge for advances in quantum computing, in order to understand and master spin entanglement. But the challenge will be, in particular, to reproduce these observations on a larger scale. And it is not won: «Here, we used two atoms, but what happens when we use three? Or ten, or a thousand? No one can predict this, because the computing power is insufficient for such numbers. Maybe one day we will be able to eavesdrop on quantum conversations that no one has ever been able to hear before.» But even better, quantum physicists at IBM recently made titanium atoms dance on a needle. IBM Research today unveiled cutting-edge nanotechnology that allows researchers to position individual atoms and control their quantum properties. This could be a turning point on the way to generally useful quantum computers. The research team developed the technique to build a quantum computing simulator. Binary computers, as you read in this article, only understand ones and zeros. They work like a switch and are on or off. Quantum computers have a third option. They can be turned on and off at the same time. This is due to a quantum property called superposition. Keying is like being able to turn on a light switch halfway to create a weird state that is neither dark nor bright, or maybe both dark and bright.

IBM Research has created a simulator of analog overlay using magnetic titanium atoms. Have properties that correspond to quantum superposition. Essentially, they used a special device, the Scanning Tunneling Microscope (STM), with a needle-like instrument to find atoms, push and pull them, and use the quantum property of the titan atom called "spin" to represent a qubit. The rotation function makes each titanium magnetic, so that it behaves like a small compass needle. Like a magnet on a refrigerator, each titanium atom has a north pole and a south pole. The two magnetic orientations define the "0" or the "1" of a qubit. We placed the titanium atom on a specially selected surface, an ultra-thin layer of magnesium oxide, to protect its magnetism and demonstrate its quantum personality.

Apparently, titanium atoms are full of personality. The researchers used microwave bursts to organize, organize and direct the atoms. The explosions emanated from the top of the STM, causing the atoms to spin in one direction or another, like pretty dancers. Using this technique, the researchers successfully simulated quantum entanglement in a 2-qubit quantum system.

Besides being incredibly cool, it only makes unique **Titanium atoms** dance the tip of a needle, no big deal, this research is having an immense impact on the field of quantum computing. Despite many advances, we were in a kind of "pre-abacus" when physicists pushed quantum mechanical interactions with lasers and experiments that jump through more hoops than an NBA season, like an abacus moment. If this technique delivers what it promises, we could be looking at a whole new approach to researching quantum computing problems.

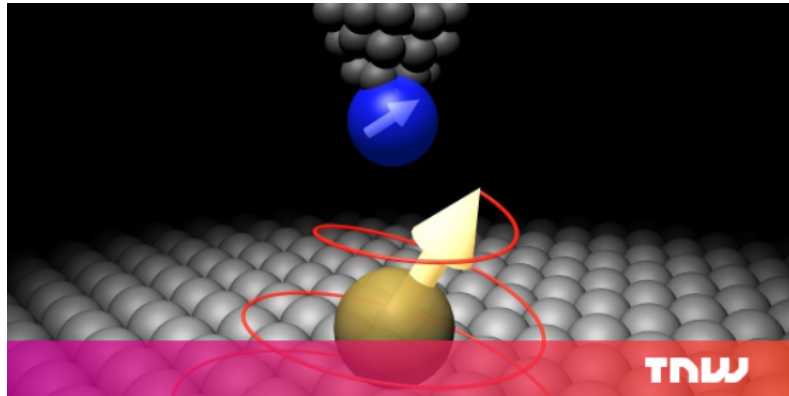


FIGURE 1H: IBM's Nobel Prize winning scanning tunneling microscope

We haven't had a chance to read all of the research yet, so we're still ironing out the details. Given that co-author Kai Yang's earlier work, in which memories were embedded in single atoms, was likely the precursor to this breakthrough, this is an exciting investigation by IBM.

Even more recently, researchers at MIT have managed to maintain quantum states for 10 seconds, a record made possible by the discovery of new qubits. Last week, researchers at the Argonne laboratory in the United States managed to maintain qubits in a state of entanglement and quantum superposition for more than 5 seconds. This record of quantum coherence has just been broken by researchers at MIT (Massachusetts Institute of Technology) who have extended it to 10 seconds. A duration made possible by the discovery of a new quantum bit taking the form of a pair of "vibrating" fermions. As is often the case in science, this discovery was made by chance. Let's start with a few notions. A quantum bit, or qubit, is the basic unit of quantum computing. In our current computers, a bit performs a series of logical operations from one of its two states, 0 or 1. The qubit is born from a "superposition" of two states. This quantum phenomenon is precisely called the principle of superposition. However, most qubits are unable to maintain their superposition and/or are reluctant to communicate with other qubits. A fermion "is a half-integer spin particle [...] which can be an elementary particle, such as the electron, or a composite particle, such as the proton, or all their antiparticles". In the current state of knowledge, "all observed elementary particles are either fermions or bosons" (the boson is "a subatomic particle of integer spin"). According to the Pauli exclusion principle, two identical fermions cannot occupy the same quantum state. Initially, the study conducted by the MIT researchers focused on the behavior of fermionic potassium-40 atoms in an ultra-cold, very low density environment. The experiment consisted of cooling them to 100 nanokelvins and then trapping them in pairs in an optical lattice using a laser system. During the experiment, the physicists noticed that in their pairs of fermions trapped in the optical lattice, the particles simultaneously exist in two states: they move together, like two pendulums swinging synchronously, but also relative to (or against) each other. The team provides the GIF below to illustrate the principle. Martin Zwierlein, professor of physics, reports: «In experimental physics, it often happens that one moment you have a light signal, and the next it goes out of control and never comes back. Here it went dark, then became bright again, and repeated itself. This oscillation shows that there is a coherent superposition which evolves in time. This discovery is the result of a happy accident.»

The physicists measured that these pairs oscillate « between these two states at about 144 hertz.

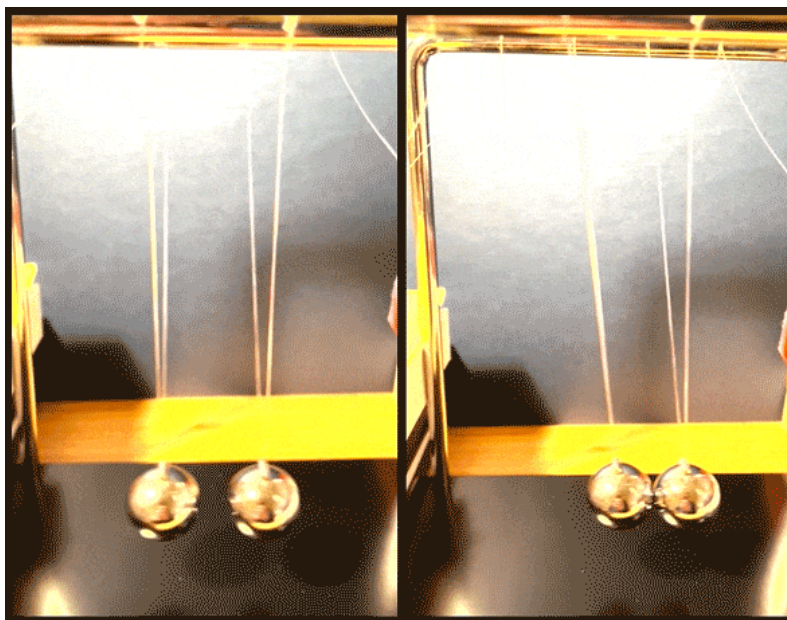


FIGURE 11: Illustration of the two superimposed vibratory states: left, opposite vibratory state, right, synchronized vibratory state: the particles simultaneously exist in two states

This is a frequency that can be heard, like a low hum,» notes Thomas Hartke.

They then managed to control the vibrational states of the fermion pairs by applying a magnetic field. «It's like starting with two pendulums that don't interact, and by applying a magnetic field, we create a spring between them, and we can vary the strength of that spring by slowly moving the pendulums apart,» explains Thomas Hartke.

The researchers were able to simultaneously manipulate about 400 pairs of fermions and maintain their superposition state for ten seconds before they collapsed into one of two vibrational states. In other words, these qubits could form a basis for future quantum computers.

Thomas A. Frank summarizes: « We estimate that the interaction of these qubits should take only one millisecond, so we can expect 10,000 operations during this coherence time, which could be competitive with other platforms. So there is a concrete hope of getting these qubits to compute.»

This ten-second coherence time is a clear advance. Nevertheless, it remains to make the fermions interact with each other, i.e. to form qubit gates. Martin Zwierlein is nevertheless optimistic: « This is a system in which we know we can make two qubits interact, there are ways for the pairs to come together, interact, and then separate again, in just one millisecond. So there is a clear path to a two-qubit gate that we will need to make a quantum computer.»

The latest experiments on quantum entanglement indicate that a large number of superimposed states of the Titanium atom is the key to the realization of computers surpassing the existing computing and memory capacities.

It is generally agreed that it was Erwin Schrödinger and Albert Einstein who discovered in the mid-1930s the phenomenon of entanglement in the equations of quantum theory, of which they were among the most important founding fathers. The entanglement phenomenon is one of the most disturbing phenomena in quantum mechanics in accordance with the Copenhagen



interpretation of quantum mechanics. Schrödinger drew a thought experiment from it which will become famous with his famous cat and Einstein another thought experiment no less famous which will be called the paradox or the EPR effect. It will be exposed in a paper published in 1935 and it was developed in collaboration with Boris Podolsky and Nathan Rosen in order to refute the Copenhagen interpretation of quantum physics.

Since the demonstration of the existence of quantum entanglement by Alain Aspect and his colleagues Philippe Grangier, Gérard Roger and Jean Dalibard in 1982, this phenomenon has been observed in many experiments and is now involved since the end of the 1990s in research programs that make people dream – namely quantum computers, quantum teleportation – as well as in the field of quantum cryptography.

Quantum entanglement has opened a very active field of research. Quantum entanglement is now understood as a fundamental phenomenon of quantum mechanics. Two physical systems, such as two particles, find themselves in a quantum state in which they become one system in some subtle sense. Before entanglement, two physical systems without interactions are in independent quantum states but, after entanglement, these two states are somehow "entangled" and it is no longer possible to describe these two systems independently.

It is clearly shown that two entangled particles are, in a way, an indivisible whole, even if they are separated by light years. The observation of a property of the first particle, or more generally of one of the two quantum entangled physical systems, will provoke faster than light (we do not know if the effect is instantaneous) a modification of another similar property for the other particle, and this, in a correlated way, not arbitrarily although with a probability law.

Quantum entanglement is a phenomenon that intimately links the properties of two particles, regardless of the distance between them. This leads to such strange effects that Albert Einstein himself doubted it! The debate was settled in 1982, when Alain Aspect performed an experiment at the Institute of Optics demonstrating the physical reality of quantum entanglement on particles of light - photons. Since then, entanglement has become an essential tool for the development of powerful cryptographic devices and the creation of quantum computers.

The entanglement phenomenon is based on the mathematical and physical principles of quantum mechanics. That is to say, the notions of state vectors and tensor products of these state vectors on the one hand, and the principles of state superposition and state vector reduction on the other.

Let us recall that in quantum mechanics, the extension of Heisenberg's matrix mechanics and Schrödinger's wave mechanics, there is a complete overhaul of the kinematics and dynamics of physical and mathematical quantities associated with observable phenomena and physical systems. Quantum mechanics, even if it deals with a wave-particle duality, is not a theory reduced to the wave mechanics of particles.

The dual character of matter and light highlighted in the case of the theory of charged particles and electromagnetic radiation is only a consequence of a recasting of the differential and integral laws associated with a physical phenomenon and a physical system.

The introduction of the concept of wave function for a particle is then only a very particular case of the introduction of the concept of state vector for a physical system possessing dynamic variables and giving rise to a measurable phenomenon, whatever this system and these variables may be, as long as a notion of energy and interaction between this system and a classical measuring instrument exists.

It is because the differential and integral laws, describing the evolution in space and time of an observable quantity in classical physics, naturally have the form of the kinematic laws of a discrete or continuous set of material points that correspondences can be found between the general quantum

formulation of these laws and those, quantum, of electrons and photons.

It is important to remember that, already in classical physics, we measure and define a phenomenon from the modification of the kinematic and dynamic state of a test particle of matter.

An electromagnetic field is defined by its effect on a test particle of charged matter at a point in space, and thus in particular, a light wave field.

The temperature can be defined by the dilatation of a material body at a point, so, here too, an observable quantity is ultimately defined by the kinematics of a material point and the balance of energy and momentum exchanges.

The solution of the wave-corpuscule duality problem is thus based on two central ideas in the Copenhagen interpretation and quantum mechanics in the form given by Dirac, Von Neumann and Weyl from the work of Bohr, Heisenberg and Born.

- There is fundamentally neither wave nor corpuscule in the classical sense in nature. These concepts are only useful, and still intervene in the theory, because they must necessarily establish a correspondence between the form of the quantum laws and those of the classical laws which must emerge from the former. Just as a test particle is used to define an electromagnetic field, a classical measuring instrument is used to define a quantum system by the way this quantum system will affect the measuring instrument. Inevitably, the kinematic and dynamic description of this device will involve classical wave and particle concepts. The quantum formalism must therefore express both this and the fundamental non-existence of classical particle and wave, just as relativity relies on the non-existence of absolute space and time. This property of the formalism is largely satisfied by the Heisenberg inequalities.
- The wave-corpuscule duality does not derive from a subtle association of particles and waves, i.e. it is not a question of particular laws restricted to the laws of motion and to the structure of the particles of matter and to the waves of the fields of interactions (electromagnetic, nuclear, etc.), but rather that the laws of evolution in time and space of any physical quantity are modified, in particular the general form of a differential law and of an integral law.

It is because this framework is quantified that it necessarily applies to any physical system in law. It is important to remember that the existence of energy is an essential property in all laws of physics. The universality of energy, and the fact that any definition of a measure of a phenomenon is ultimately based on an interaction with energy, automatically ensures that the laws of quantum mechanics apply to describe the evolution of an arbitrary system.

This is why wave mechanics, which is largely based on the existence of a strong analogy between Maupertuis' principle for the motion of a particle of matter and Fermat's principle for a ray of light, is only a very special case of quantum mechanics, since the latter does not concern the laws of motion in space and time of particles but the evolution of all physical quantities that can be measured directly or indirectly. In particular, the laws of quantum mechanics naturally contain the possibility of the creation and destruction of a particle and its transformation into another, which is not a phenomenon that can be described from the principles of Fermat or Maupertuis.

The construction and form of quantum theory is thus based on the ideas that :

- The laws of physics are fundamentally not about anything in space and time.
- Particles and waves are not fundamental structures but approximations of the form of the laws and objects of the physical world.

- Energy is at the heart of the quantization process, ensures and explains the universal character of quantization (quantization of certain classical dynamic variables, amplitudes of probabilities for the observation of these values).

However, the laws of quantum mechanics have emerged historically and can be introduced pedagogically to a first approximation, along with the wave and matrix mechanics of particles in classical space and time. But it is essential to understand as soon as possible that these mechanics are not the true structure of quantum mechanics.

The way of proceeding is therefore reminiscent of thermodynamics which works independently of the atomic or non-atomic structure of the physical system. The total energy of the system is considered, it is called a state function of the system and there is a set of fundamental variables that are called state variables linked by the energy function and other state functions of the thermodynamic system. The system is defined as a black box whose interior does not matter, only the incoming and outgoing energy balances and the values of the measured state variables.

Quantum mechanics does, however, synthesize wave and corpuscular structures for the evolution of physical quantities. This means that, in particular, the physics and mathematics of waves and fields must be found in the form of these laws, so that, when they are applied to particular systems such as electrons, protons and the classical electromagnetic field, one finds the wave mechanics of these systems.

Thus, the principle of superposition of fields in electrodynamics and optics must be found to describe the state of a quantum system. The whole structure of Fourier analysis in particular must be present.

Similarly, the structure of analytical mechanics with the Hamilton function of the energy of a classical mechanical system must be preserved and play a central role.

Keeping the previous considerations in mind, the way quantum mechanics is constructed becomes clearer.

To a physical system, we associate observable variables  $A_i$  and a total energy  $H$  called the Hamiltonian.

In the case of a particle with momentum variables  $P_i$  and positions  $Q_i$  immersed in a potential  $V(Q_i)$ , the function  $H$  of the particle is written  $H=T(P_i)+V(Q_i)$  where  $T(P_i)$  is the kinetic energy of the particle.

In its initial form, the Schr dinger equation for such a particle then involved an object called the energy operator  $H$ , derived from the previous function, and gave rise to a differential equation for a function  $\Psi(Q_i)$  called the wave function, the square of which gives the probability of measuring the particle with the value  $Q_i$  of its position.

The formulation of quantum mechanics takes up all this by generalizing it. We still have an energy operator  $H$  but the wave function is only a particular case of the state vector (think of thermodynamics) of any physical system. To show the break with the concept of wave function, this vector is designated by :  $|\Psi\rangle$ . This is Dirac's vector notation for the abstract Fourier analysis of Hilbert's functional analysis for linear differential and partial differential equations. A dynamic observable variable  $A$ , transcribed in the form of a linear operator  $A$ , can then possess a sequence of values  $a_n$  during a measurement. Experience shows that there is a probability  $|c_n|^2$  to observe each value  $a_n$ , and that the state vector of the system is written as a vector sum of basis vectors  $|a_n\rangle$  associated to each value  $a_n$  such that:  $|\Psi\rangle=\sum c_n|a_n\rangle$  where  $\sum |c_n|^2=1$  with  $n=1,2,\dots$  as it should be for the introduction of probabilities.

The basis vectors  $|a_n\rangle$  and the values  $a_n$  are called the eigenvectors and eigenvalues of the linear operator  $A$ . It is in this sense that we speak of superposition of states in quantum mechanics. The

coefficients  $c_n$  are complex numbers whose square gives the probability of finding the system in the state  $c_n|a_n\rangle$  of its dynamic variable A. These can be position, velocity, and any quantum state variable that can be combined to express the characteristics of the system.

In the case of electrons, the diffraction and interference phenomena they exhibit are based precisely on this principle of superposition of states applied to their positional states. Except that we are not dealing with a discrete sequence of values  $x_n$  for  $Q_1=x=A_1$  but with a continuous distribution. This is also why, in general, we speak of amplitudes of probability about  $c_n$  by analogy with light waves where the square of an amplitude gives the intensity of the light at a point. The Schrödinger equation in its general form is then an evolution equation written :  $i\hbar d|\Psi\rangle/dt=H|\Psi\rangle$  where  $i$  is the imaginary unit :  $i^2=-1$  ;  $\hbar$  is the reduced Planck constant (Dirac constant) with  $\hbar=\frac{h}{2\pi}$  where  $h$  is the Planck constant  $h=6.62607015 \cdot 10^{-34} \text{ m}^2\text{kg/s}$  and  $H$  is the Hamiltonian, generally time dependent, observable sometimes corresponding to the total energy of the system. If one has understood well the long reflections developed previously, one will not be surprised that from the moment one can define an energy and physical variables for any system, the previous Schrödinger equation will apply and that it is absolutely not confined to notions of evolution in space and time of a particle in a potential. In particular, if the system were a quantum animal that could be either in the form of a quantum whale or in the form of a quantum dolphin, in the sense that it would be two energy states of the same physical system, a quantum aquatic mammal for example, the Schrödinger equation would apply! This is what happens in the oscillation phenomena of neutrinos or K mesons. Not to mention isospin multiplets like quarks and leptons in electroweak theory and in QCD. **It is obvious that this has nothing to do with notions of wave-corpuscule duality and wave mechanics.**

During a measurement, the state vector makes a quantum jump to consist only of  $|a_n\rangle$ . By analogy with a superposition of plane waves in a wave packet, we then speak of wave packet reduction for the wave function of the position of a particle and, in all generality, of state vector reduction for a quantum system.

These fundamental notions having been recalled, we can study the phenomenon of entanglement a little more closely.

Let us consider a simple quantum system, a quantum coin for a quantum coin toss. The basic state vectors will be  $|f\rangle$  and  $|p\rangle$  for heads and tails. The coin will be able to be in a quantum superposition state such that its state vector is  $|\Psi\rangle=c_1|f\rangle+c_2|p\rangle$  where  $|c_2|^2$  will give the probability of observing the coin in the tails state, e.g..

Let us introduce two coins A and B, then we will have two state vectors:

$$|\Psi_A\rangle=c_{1a}|f_a\rangle+c_{2a}|p_a\rangle \text{ and } |\Psi_B\rangle=c_{1b}|f_b\rangle+c_{2b}|p_b\rangle.$$

The two parts are considered to be without interactions at the beginning, which means that we will have two independent Hamiltonians  $H_a$  and  $H_b$ . Let  $H$  be the Hamiltonian of the system composed by these two parts and  $|\Psi\rangle$  its state vector. Then  $H=H_a+H_b$  and the state vector of the complete system and the most general form of the solution of the Schrödinger equation is a rather special product called the tensor product  $\otimes$  of the state vectors of each part. Thus:

$$|\Psi\rangle=(c_{1a}|f_a\rangle+c_{2a}|p_a\rangle)\otimes(c_{1b}|f_b\rangle+c_{2b}|p_b\rangle)=c_{1a}c_{1b}|f_a\rangle\otimes|f_b\rangle+c_{1a}c_{2b}|f_a\rangle\otimes|p_b\rangle+c_{2a}c_{1b}|p_a\rangle\otimes|f_b\rangle+c_{2a}c_{2b}|p_a\rangle\otimes|p_b\rangle. \quad (3)$$

This is just the abstract transcript of the separation of variables technique in a partial differential equation.

If the Hamiltonian is no longer decomposable into a sum of Hamiltonians of parts without interactions, for a brief moment when the parts would be electrically charged for example, the state vector of the system can no longer be described exactly as a tensor product of the state vectors of

its parts without interactions.

This is precisely the case that is called an intricate state!

But be careful, this requires some important precisions. The state vector is always a sum of tensor products of basic states, heads and tails of a coin without interaction; but, the coefficients giving the amplitudes of probabilities of finding the results of the observations on the two coins are no longer decomposable into products of the amplitudes of the states of each coin before interaction, i.e. entanglement.

If the two entangled parts are separated and transported to the antipodes of each other, a measurement on one will instantly affect the quantum state of the other. This means that the results of the measurement on the second will no longer be independent of the measurements already made on the first.

The EPR paradox and Bell's inequalities are essentially based on analogous situations, with physical systems that formally give rise to the same mathematical equations.

We see here the strength of the abstract formulation of quantum theory, and especially of the nature of quantum theory itself, in that general principles are at work in a great variety of different physical systems and which translate into mathematical equations that are largely independent of the form, and of the physical system and the physical variables of this system.

Thus, the principles of quantum mechanics can be tested with the physical system and the type of dynamic variable that is easiest to realize experimentally to analyze a given quantum phenomenon. In fact, the EPR paradox was initially formulated with position and momentum variables for a pair of particles. But it retains most of its meaning if we take the spin variables of a pair of particles, whether electrons or photons for example. This is why David Bohm had proposed to test it in this form and this is what Alain Aspect did in 1982 with a pair of polarized and entangled photons.

High frequency trading is the system used by the big banks where thousands of sales and redemptions are made in a few fractions of a second, these operations are carried out by robots, it is the technological drift of current finance. The market is rigged by these big hands whose high frequency trading used in the big banks. Human operators no longer have any control, the only thing they can do is follow the trend, and it is the very big banks that set the trend. Financial assets are valued at levels that no longer correspond at all to the reality of the companies. The mathematicians who wrote the high-frequency trading programs made their fortune by destroying lives, and this represents a large part of the transactions.

In 2012, the Ummites took control of high frequency trading to avoid the flash crash. They intervened in order to steal from the thieves as well as to make them understand the existence of an invisible operator capable of challenging their actions. The invisible operator is their quantum computer based on blocks of Titanium with a perfect crystal structure described before where it has several trillions of Titanium atoms that are excited with a superposition of 10 different states which gives a computing memory capable of crushing all human high frequency trading machines. That's why traders asked themselves: How could all these transactions be made by a single computer?

The Ummites have baffled all the transactions of the Goldman Sachs thieves, they crushed the human machines.

The Ummite computers literally crushed human machines. There was an article in 2013 in the magazine Science it seems to me which concluded that such a financial operation was physically impossible on high frequency trading carried out by a single computer, not only is their quantum computer more discreet than ours, but it has a computing power of several billion operations in a fraction of seconds, it has ridiculed the big banks, better than TRUMP during his term. and robbed the thieves, they are indeed extra-terrestrial Robin Hoods. We are only at the beginning of

quantum computing and there are still many techniques for quantum excitation and entanglement that are unexplored today. We are only at the beginning of quantum computing and there are still many techniques for quantum excitation and entanglement that are unexplored today.

Harvard-MIT quantum computing breakthrough: « We're entering a whole new part of the quantum world.» The development of quantum computing has gained considerable momentum in recent years, and many important technological milestones have been reached. The latest breakthrough has been achieved by a team of physicists at the Harvard-MIT Center for Ultracold Atoms and other universities, who have developed a special type of quantum computer, called a "programmable quantum simulator," capable of operating with 256 quantum bits, or "qubits." The new system marks an important step toward building large-scale quantum machines that could be used to shed light on a multitude of complex quantum processes, according to the researchers.

A quantum computer uses the quantum properties of matter, such as superposition and entanglement, to perform operations on data. Quantum computers operate on quantum bits or qubits, which are considered to be the unit of quantum information, which is the same as a bit for a classical computer. The quantum state of the qubits can have several values. Unlike the binary bits of traditional computers, which take on the value 0 or 1, qubits occupy what is known as the quantum superposition - an undefined and unmeasured state that can effectively represent both 0 and 1 in the context of a larger mathematical operation. This esoteric principle of quantum mechanics means that quantum computers can theoretically solve extremely complex mathematical problems that classical computers would never be able to answer (or would take years to try). In theory, the computational performance of a quantum computer grows exponentially as the number of qubits that can be manipulated grows. And work by Harvard-MIT physicists has just increased the number of qubits.

According to a paper published this month in the journal *Nature*, the system marks an important step toward building large-scale quantum machines that could be used to shed light on a multitude of complex quantum processes and ultimately contribute to real-world breakthroughs in materials science, communications technology, finance and more, overcoming research hurdles that are beyond the current capabilities of the fastest supercomputers. "This takes the industry into a new realm where no one has gone before," said Mikhail Lukin, George Vasmer Leverett Professor of Physics, co-director of the Harvard Quantum Initiative, and one of the lead authors of the study published on July 7, 2021. "We are entering a completely new part of the quantum world.

Programmability and increasing the number of qubits are behind the breakthrough.

Under the right conditions, the increase in the number of qubits means that the system can store and process exponentially more information than the conventional bits that standard computers operate on. According to Sepehr Ebadi, a physics student in the Graduate School of Arts and Sciences and lead author of the study, it is the combination of the new system's unprecedented size and programmability that puts it at the forefront of the quantum computer race, which harnesses the mysterious properties of matter at extremely small scales to dramatically advance processing power.

"The number of possible quantum states with just 256 qubits exceeds the number of atoms in the solar system," Ebadi said to explain the system's massive size.

According to the study report, the simulator has already allowed researchers to observe several exotic quantum states of matter that have never been realized experimentally before, and to perform a quantum phase transition study so precise that it serves as a textbook example of how magnetism works at the quantum level. These experiments provide powerful insight into the quantum physics behind materials properties and can help show scientists how to design new materials with exotic

properties, according to the paper.

The project uses a significantly improved version of a platform the researchers developed in 2017 that was capable of reaching a size of 51 qubits. That earlier system allowed researchers to capture ultra-cold rubidium atoms and arrange them in a specific order using a one-dimensional array of individually focused laser beams, called optical tweezers. This new system allows atoms to be assembled in two-dimensional arrays of optical tweezers. This increases the size of the system from 51 to 256 qubits. With the clamps, researchers can arrange atoms in defect-free patterns and create programmable shapes such as square, honeycomb or triangular meshes to develop different interactions between qubits, the report reads. Ebadi added, "The workhorse of this new platform is a device called a spatial light modulator, which is used to shape an optical wavefront to produce hundreds of individually focused optical tweezer beams." He continued, "These devices are essentially the same as those used inside a computer projector to display images on a screen, but we have adapted them to be a key component of our quantum simulator."

The system continues to be improved by making it more programmable, and new applications are being explored

The initial loading of atoms into the optical tweezers is random, and researchers must move the atoms to arrange them in their target geometries. Researchers use a second set of movable optical tweezers to slide the atoms to the desired location, eliminating the initial randomness. The lasers allow the researchers to fully control the positioning of the atomic qubits and their coherent quantum manipulation.

Other lead authors of the study include Harvard professors Subir Sachdev and Markus Greiner, who worked on the project with Professor Vladan Vuleti; of the Massachusetts Institute of Technology, as well as scientists from Stanford, the University of California Berkeley, the University of Innsbruck in Austria, the Austrian Academy of Sciences and QuEra Computing Inc. in Boston.

Tout Wang, a research associate in physics at Harvard and one of the authors of the paper, said, "Our work is part of a very intense and highly visible global race to build larger and more efficient quantum computers." He noted, "The global effort [beyond ours] involves leading academic research institutions and major private sector investments from Google, IBM, Amazon and many others."

A team of Australian researchers earlier this year reportedly solved part of the problem of scaling up quantum computers by developing a cryogenic chip capable of handling qubits electronically at temperatures near absolute zero. This device has potentially opened the door to quantum computers with thousands of qubits, whereas the most advanced current models have a few dozen. This cryogenic system, called "Gooseberry," could, in turn, lead to scientific breakthroughs that would result in better medicines or more accurate models of the climate and financial system.

Returning to the latest study, Harvard-MIT researchers are currently working to improve the system by perfecting the laser control over the qubits and making the system more programmable. They are also actively investigating how the system can be used for new applications, ranging from finding exotic forms of quantum matter to solving difficult real-world problems that can be naturally encoded on the qubits. "This work opens the door to a lot of new scientific directions," Ebadi said. "We are far from reaching the limits of what can be done with these systems."

The machine seems to be running as the giant IBM communicates its roadmap for its upcoming developments in quantum computing.

The company plans to create a quantum processor with more than 1000 qubits in 2023.

For more than a decade, scientists and engineers have indicated that "one day" a full-fledged quantum computer would be built that could perform useful calculations that would overwhelm any conventional supercomputer. But current machines contain only a few dozen qubits (the quantum

state that represents the smallest unit of quantum information storage. It is the quantum analog of the bit), not enough to do anything more dazzling than.

IBM seems to be taking a step towards these aspirations by announcing publicly, for the first time, a roadmap for its upcoming developments in the field of quantum computing.

Among the various works planned, the company says it wants to develop a processor called Condor with a power of 1000 qubits: "Today we are releasing the roadmap that we believe will take us from the noisy small-scale devices of today to the million-plus qubit devices of the future. Our team is developing a suite of scalable, larger and better processors with a 1000+ qubit device, called the IBM Quantum Condor, which should be available in late 2023."

Currently IBM's quantum chips reach 65 qubits. Next year, it plans to go to 127 qubits and even 433 qubits in 2022. To achieve this, IBM is working on a dilution refrigeration system to house the chips with a higher density:

"In order to house even more massive devices beyond Condor, we are developing a dilution refrigerator that is larger than any commercially available refrigerator today. This roadmap sets us on the path to the million-plus qubit processors of the future with cutting-edge knowledge, multidisciplinary teams, and an agile methodology improving every element of these systems. All the while, our hardware roadmap is at the heart of a larger mission: to design a full-stack quantum computer deployed via the cloud that anyone in the world can program."

Big Blue just finalized a processor with 65 qubits. Named "Hummingbird," it succeeds "Falcon," which had only 27 and was created in 2019 :

"Along with our efforts to improve our smaller devices, we are also incorporating the many lessons learned into an aggressive roadmap for moving to larger systems. In fact, this month we quietly released our 65-qubit IBM Quantum Hummingbird processor to our IBM Q Network members. This device features 8:1 read multiplexing, which means we combine the read signals from eight qubits into one, reducing the total amount of cabling and components needed for reading and improving our ability to scale, while preserving all of the high performance features of the Falcon generation of processors. We have significantly reduced the signal processing latency in the associated control system in anticipation of future feedback and feedback system capabilities, where we will be able to control the qubits based on classical conditions while the quantum circuit is operating." For the future, IBM plans to release a new quantum processor each year with more and more qubits: "Eagle" in 2021 (127 qubits), "Osprey" in 2022 (433 qubits) and "Condor" in 2023 (1121 qubits):

"Next year, we will launch our 127-qubit IBM Quantum Eagle processor. Eagle has several upgrades to get it past 100 qubits: crucially, through-silicon via and multi-level wiring offer the ability to efficiently deploy a high density of conventional control signals while protecting the qubits in a layer to maintain high coherence times. Meanwhile, we have struck a delicate balance between connectivity and crosstalk error reduction with our fixed-frequency approach to two-qubit gates and the hexagonal qubit arrangement introduced by Falcon. This qubit layout will allow us to implement the 'heavy hex' error correction code that our team introduced last year, so that as we increase the number of physical qubits, we can also explore how they will work together as error-correcting logic qubits: every processor we design takes fault tolerance considerations into account.

"With the Eagle processor, we will also introduce simultaneous real-time classical computing capabilities that will enable a broader family of quantum circuits and codes to run.

"The design principles established for our small processors will put us on track to launch a 433-qubit IBM Quantum Osprey system in 2022. More efficient and dense controls and cryogenic infrastructure will ensure that scaling our processors will not sacrifice the performance of our individual qubits,



introduce additional sources of noise or occupy too large a footprint.

"In 2023, we will launch the 1121-qubit IBM Quantum Condor processor, incorporating lessons learned from previous processors while continuing to reduce critical errors with double-digit qubit counts to run longer quantum circuits. We see Condor as an inflection point, a milestone that marks our ability to implement error correction and scale our devices, while being complex enough to explore potential quantum advantages - problems we can solve more efficiently on a quantum computer than on the world's best supercomputers."

IBM research director: "A roadmap is more than a plan and a PowerPoint presentation"

"We're very excited," said Prineha Narang, co-founder and CTO of Aliro Quantum, a startup that specializes in code that enables high-level software to run efficiently on different quantum computers. "We didn't know the specific milestones and numbers they announced," she says.

Dario Gil, IBM's director of research, says he's confident his team can meet the timeline: "A roadmap is more than a plan and a PowerPoint presentation," he says, "it has everything to do with an execution plan."

IBM is not the only company with a roadmap for building a full-fledged quantum computer. At least in terms of public relations, IBM has caught up with Google, which a year ago made headlines when the company announced that its researchers had used their 53-qubit quantum computer to solve a particular abstract problem that they believed would overwhelm any conventional computer - reaching a milestone known as quantum supremacy. Google has its own roadmap for building a million-qubit quantum computer within 10 years as Hartmut Neven, who heads Google's quantum computing division, explained in an interview in April, though he declined to reveal a specific timeline for progress.

IBM's stated timeline carries an obvious risk that everyone will know if they miss their milestones. But the company decided to reveal its plans so that its customers and employees would know what to expect. Dozens of quantum computing startups are using IBM's current machines to develop their own software products, and knowing IBM's milestones should help developers better match their efforts to the hardware, Gil believes.

A 1,000-qubit machine is a particularly important milestone in the development of a full-fledged quantum computer, the researchers say. Such a machine would still be 1,000 times too small to fulfill the full potential of quantum computing (such as overcoming current Internet encryption schemes), but it would be powerful enough to spot and correct the myriad quantum errors.

In the same vein, IBM has just solved this quantum computing problem 120 times faster than before. Using a combination of tweaked algorithms, improved control systems, and a new quantum service called Qiskit Runtime, IBM researchers were able to solve a quantum problem 120 times faster than the previous time they tried it. Qiskit is IBM's quantum software development platform; Qiskit Runtime is a new containerized software that runs in IBM Cloud where it leverages IBM's classical hardware and the proximity of IBM's quantum processors to accelerate performance. IBM launched the software on Tuesday at its Think virtual event.

In 2017, IBM announced that, equipped with a seven-qubit quantum processor, its researchers had successfully simulated the behavior of a small molecule called lithium hydride (LiH). At the time, the operation took 45 days. Four years later, the IBM Quantum team announced Tuesday that the same problem had been solved in just nine hours. The simulation was run entirely in the cloud, through IBM's Qiskit platform - an open source tool library that allows developers around the world to create quantum programs and run them on prototype quantum devices that IBM makes available in the cloud.

IBM recently introduced Qiskit Runtime as part of its software roadmap for quantum computing,

and estimated at the time that the new service would enable 100x speedup of workloads. With a 120x speedup, then, it appears that Big Blue has exceeded its own goals.

The necessarily hybrid nature of quantum computing has spurred community efforts to speed up the classical part of the work in recent years. Not only have the control elements handled by classical systems been improved, but steady progress has been made in understanding how to decompose the quantum algorithms themselves with parts of the algorithm running on classical systems. Co-location or proximity of classical and quantum computing systems has also shown benefits.

Quantum programs: combining classical processors and quantum circuits.

According to an IBM blog post authored by researchers Blake Johnson and Ismael Faro, classical computing remains a fundamental part of Qiskit, and any quantum operation performed in the cloud. A quantum program can effectively be broken down into two parts: using classical hardware, such as a laptop, developers send requests via the cloud to the quantum hardware - in this case, to IBM's quantum computing center in Poughkeepsie, New York.

"The quantum method is not just a quantum circuit that you run," Blake Johnson, quantum platform manager at IBM Quantum, explained in a statement. "There is an interaction between a classical computing resource that makes requests to the quantum hardware, and then interprets those results to make new requests. This conversation is not a one-time thing - it happens over and over again, and you need it to be fast."

With each query sent, a few tens of thousands of quantum circuits are executed. To simulate the small molecule LiH, for example, 4.1 billion circuits were executed, which equates to millions of requests going back and forth between the classical and quantum resource, according to the researchers. When this conversation takes place in the cloud, via an Internet connection, between a user's laptop and IBM's U.S.-based quantum processors, latency can quickly become a significant obstacle.

For example, while solving a problem as complex as molecular simulation in 45 days (in the case of IBM's previous test demonstration) is a start, it's not enough to achieve the quantum advances that excite scientists.

But the system has been deeply improved since the last time. "We currently have a system whose architecture is not inherently tied to the fact that real workloads have these quantum and classical loops," Johnson explained.

Based on this observation, IBM's quantum team set out to build Qiskit Runtime - a system designed to natively accelerate the execution of a quantum program by removing some of the friction associated with the ongoing back and forth between the quantum and classical worlds. Qiskit Runtime creates a containerized execution environment located in close proximity to the quantum hardware. Rather than sending numerous requests from their device to the IBM Cloud-based quantum computer, developers can therefore send entire programs to the Runtime environment, where IBM's hybrid cloud uploads and runs the work for them.

In other words, the loops that occur between the classical environment and the quantum environment are contained in Runtime, which is itself close to the quantum processor. This reduces the latency associated with communication between the user's computer and the quantum processor.

"The classical part, which generates requests for the quantum hardware, can now be run in a container platform that is in the same location as the quantum hardware," Johnson explained. "The program running there can ask the quantum hardware a question and get an answer very quickly. It's a very low-cost interaction, so these loops are suddenly much faster." IBM launches Qiskit Runtime in beta for quantum computing.

Until now, Johnson explained, most of the research effort has been focused on improving the quality of the quantum circuitry. In practice, this has meant developing software to correct errors and improve the fault tolerance of quantum hardware. In that sense, Qiskit Runtime marks a shift in thinking: instead of working on the quality of the quantum hardware, Johnson said, the system increases the overall capacity of the program.

Paul Smith-Goodson, quantum computing analyst at Moor Insights & Strategy, agrees: "It's not only more efficient, but also more technically convenient to have classical resources in the cloud. IBM's traditional machines are designed and maintained specifically for this process. That way, the end user doesn't have to worry about things like control software, cloud software, capacity, etc." Still, the 120x speedup wouldn't have been possible without additional hardware performance tweaks. Algorithmic improvements, for example, reduced the number of model iterations needed to get a final answer by two to ten times; while improved processor performance means that each iteration of the algorithm requires fewer passes through the circuit.

At the same time, upgrades to the system software and control systems have reduced the execution time of each circuit for each iteration. "Quality is a key ingredient that also allows the entire system to run faster," Johnson said. "It's the harmonious improvement of quality and capability working together that makes the system faster."

Now that the speedup has been demonstrated in the LiH molecule simulation, Johnson hopes to see developers use the improved technology to experiment with quantum applications in a variety of different fields beyond chemistry.

Big Blue reiterated its commitment to finding practical use cases for quantum computing. In another demonstration, for example, IBM's quantum team used Qiskit Runtime to run a machine learning program for a classification task. The new system was able to run the workload and find the optimal model to label a dataset in what Johnson called "significant" time.

Qiskit Runtime will initially be released as a beta version, for a limited number of IBM Quantum Network users, and will come with a fixed set of configurable programs. IBM expects the system to be available to all users of the company's quantum services in Q3 2021.

"We expect the Qiskit Runtime to enable users around the world to take full advantage of the 127-qubit IBM Quantum Eagle device planned for this year - or the 1,121-qubit Condor device planned for 2023. Qiskit Runtime is currently in beta for select members of the IBM Quantum Network."

The system certainly puts IBM on track to meet the goals outlined in the company's quantum software roadmap, which calls for frictionless quantum computing in a number of applications by 2025. Overall, activity in the field of quantum computing has exploded in recent years. For example, a group of Dutch researchers working at the QuTech quantum research institute in the Netherlands built the first-ever multi-node quantum network by successfully connecting three quantum processors. The nodes can both store and process qubits (quantum bits) and the researchers have provided proof that quantum networks are not only feasible, but also capable of being scaled up to provide humanity with a quantum Internet. Their efforts have been made possible by quantum entanglement. While waiting for the UMMO computers, perhaps these technological advances will help us to test all the possible combinations to reconstruct the pixelated image, succeeding in reconstructions that resemble and were already something enormous.

OYAGAA AYOY YISSAA now has a direct competitor to solve this type of inverse problem which all the experts said was impossible. "An intelligent person solves a problem. A wise person avoids it.", ALBERT EINSTEIN

"A problem without a solution is an ill-posed problem." A.EINSTEIN

EINSTEIN is right but the reciprocal is false, an ill-posed problem can have a solution. This resolution can be done by numerical simulation or analytically. The mathematical solution is made difficult by the fact that the inverse problems are in general ill-posed problems, that is to say that the only observations are not sufficient to perfectly determine all the parameters of the model. It is therefore necessary to add constraints or priors that reduce the space of possibilities in order to arrive at a unique solution.

We find inverse problems in many scientific domains, in particular in the study of complex systems for which we have access to only a small number of measurements, for example: the Earth in geophysics, organic tissues in medical imaging, the Universe in cosmology, a concert hall in acoustics architectural...

Examples: resolution of a linear system, petroleum engineering, tomography in medicine, deconvolution (especially in imaging), determination of constants a chemical reaction, determination of the shape of an obstacle by radar, underwater acoustics,...

natural intelligence theory

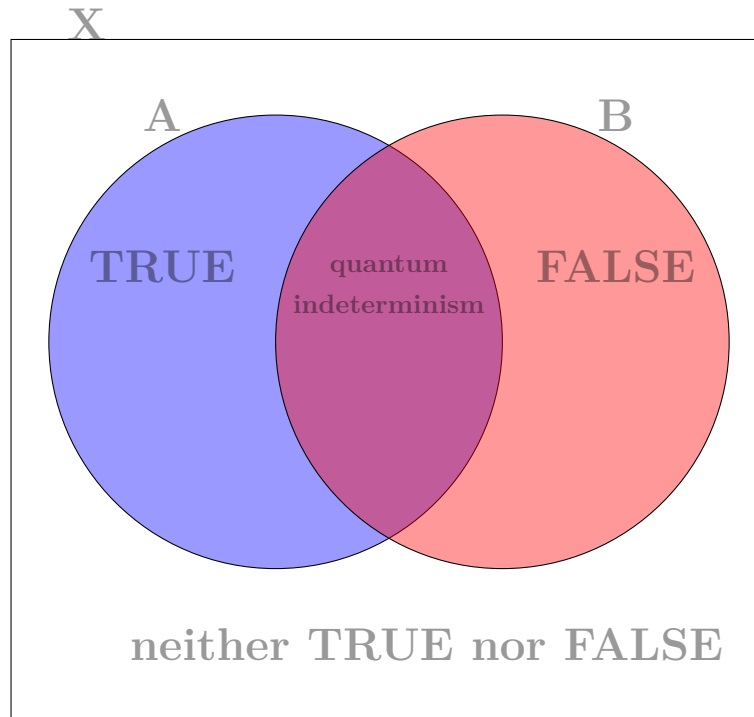
Body management, beliefs, logic, emotions, instinct and insight are to intelligence what your fingers are to your hand. If one of them is too stiff, that whole part of your body will be dysfunctional. The less demanding thoughts you have, the more your intellect will manifest. The very first doctrine of evolution that can explain how nature generated human beings. To defend his theory of natural intelligence, he gives an overview of the main advances in scientific research, the most recent technologies going back to Antiquity. From the fundamental principles of quantum physics to the study of genetics, or even the theories of evolution, we review in an enlightening way centuries of human progress. Among other things, he offers his reflections on the links between cultural differences and evolution, on sexual selection, on epigenic phenomena and even on the question of the existence of God. It is always on the basis of scientific rationality, rather than false beliefs that lead men to commit violent and irresponsible acts, that a better understanding of true human nature can be gained. The history of the universe, the origins of life, the evolution of species and the big questions constitute the four sections of this text. These will do much more than enrich your knowledge, they will make your personality grow.

Face Depixelizer is a program that uses artificial intelligence to turn pixelated images into real photos. And thus transform weakly defined files into high definition images. Developed by Russian Denis Malimonov, this program is based on the principle of StyleGan, a generative artificial intelligence adversarial network called Pulse that creates photorealistic human faces. The Pulse algorithm was introduced by Nvidia researchers and has been available since February 2019.

Thus, from a pixelated image containing very little information, it is possible to create a face that seems to be what it should look like via this program.

If you are not satisfied with the image offered by Face Depixelizer, know that it is possible to modify the advanced settings to more or less refine the final result. If some are worried about the possibility of identifying deliberately blurred faces, the creator specifies that it is impossible and that the tool is only capable of creating imaginary faces. In any case, Pulse was not designed to reconstruct the original image nor to allow the identification of the person present in the pixelated photo. It is in any case extremely difficult to perform facial recognition from blurred images, the risk of error being far too high. As the authors of this project explain, it is above all a question of obtaining high resolution images easily and quickly. And so to overcome certain scenarios where the capture of such images turns out to be very complicated: in medicine, in astronomy, or even on old photos whose files are in low definition. Thus, PULSE would represent considerable progress for the scientific community as well as for the entertainment industry, by making it possible to easily

(and cheaply) restore photos or low-quality video sequences. A fact that cannot be realized, that goes beyond the limits of the possible. Natural intelligence exists and if used well, it is superior to artificial intelligence. Impossible for you, not for the Ummites and Sébastien LABLANCHE...

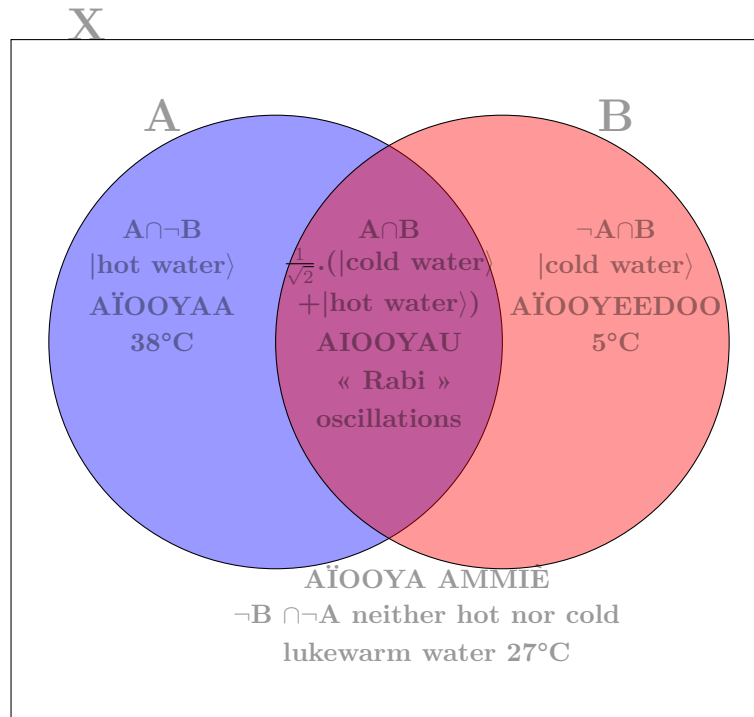


Indeterminism {TRUE and FALSE at the same time} denies that any event is predictable by a physical or mathematical law. This theory seems to have found a striking confirmation with Heisenberg's uncertainty principle on the specific case of elementary particles. Chaos theory is a mathematical theory which shows that, in the general case, a physical system, although purely causal, is unpredictable.

In fact, the vast majority of systems, although purely causal, are unpredictable, and those used as examples by the so-called « hard » sciences are exceptions.

The fourth value {NEITHER TRUE NOR FALSE} is the fourth logical domain that tetrality introduces. Let's imagine a group of people who are asked to dip their hand in a basin of water at a temperature of about five degrees Celcius. The question is asked: « Is the water cold? Of course the answer is unanimous: « yes ». To the opposite question: « Is the water hot? » each person will also answer « no ». Let's change the water in the basin for another one at a temperature of 38°C, and asking the same questions again: the answers will all be the opposite of the previous ones. And all this is quite logical, by virtue of the principle of symmetry: everything has its opposite, and our words are there to say it. But now, let's change again the water in the basin to this temperature of 27°C, and ask again the same questions. This time, some of the people in the group will answer « yes » while others will say « no ». And if we ask them about the reasons for their differences, a conclusion will soon emerge that will be obvious to everyone: « but let's see, this water is neither hot nor cold: it is simply lukewarm, and that's it ». what is the word that means

the opposite of lukewarm? There are words that illustrate the fourth domain of tetravalent logic, they are sets of four words that are symmetrical two by two, and whose pairs are orthogonal: the orthosymmetrical sets.



Here, on this Venn diagram, the case {TRUE and FALSE at the same time} corresponds to the superposition of states in quantum mechanics  $\frac{1}{\sqrt{2}}.(|cold\ water\rangle + |hot\ water\rangle)$  which cannot be quantified because it is quantum indeterminism while the {NEITHER TRUE NOR FALSE} case can be associated here with the "high" weighted average of the two temperatures (hot and cold).  $\frac{38+5}{\sqrt{2}}=30,40^{\circ}\text{C}$  is a statistical average while  $27^{\circ}\text{C}$  is the actual warm temperature.

The superposition of two states  $|FALSE\rangle$  and  $|TRUE\rangle$  is the sum  $\frac{1}{\sqrt{2}}.(|cold\ water\rangle + |hot\ water\rangle)$  but in practice we cannot calculate this sum, this sum can however be used to build a formal equation from the 2 states, for example the shape of the anallagmatic spirals constituted by the superposition of the FERMAT and LITUUS spirals of respective equations  $(\frac{r}{a})^2 = 4\theta$  and  $(\frac{r}{a})^{-2} = 4\theta$  which gives the equation for anallagmatic spirals  $(\frac{r}{a})^2 + (\frac{r}{a})^{-2} = 4\theta$ . The constant  $\frac{1}{\sqrt{2}}$  factorizes on the left and right members and thus disappears after simplification, the right member is kept as a pillar as the common point of the two equations that we will approach to illustrate the use of the tetravalence to explain the structure of the cosmos.

Quantum superposition is a fundamental - but perfectly counter-intuitive to the human mind - characteristic of particles smaller than the atom that makes it possible for them to be simultaneously in different states. Very schematically, this principle states that if a particle - an electron, a photon or a proton (among other elementary particles) - can be in point A or in point B, then it is in A and in B. Ditto: if an electron can go at 2000 km/s or at 1000 km/s, it goes at both speeds

at the same time. The states are said to be "superimposed". The basis of all quantum physics Superposition is the basis of quantum physics, "the one from which everything stems... but also the most shocking one", says David Louapre, engineer, holder of a thesis on loop quantum gravitation, host of Sciences  tonnantes and author of "Mais qui a attir  le Bison de Higgs".

Even stranger, "the principle of superposition is not limited to two states", he explains, "when an electron turns around a proton in the hydrogen atom, it is on all the points of its orbit at the same time" and not simply at point A or point B or point C.

The famous and very chafouin Richard Feynman (Nobel Prize of Physics in 1965) warned in his conferences - gathered in the book "Matter and Light" - that "if for you an electron turns around a nucleus like a satellite turns around a planet, it is because your vision of the atom remained blocked in 1915".

Difficulty of interpretation for the human mind The common sense does not easily apprehend the quantum superposition. In the macroscopic universe (ours) a "classical" object - a human, a ball, a train, the sun - is in one place... and not in another. And it does not have several speeds at the same time.

The explanation of this difficulty to represent this principle of superposition is - according to Etienne Klein - that the quantum theories that work perfectly to predict experimental results (at least until now) are entirely derived from mathematics (we even talk about "quantum formalism"). This impossible representation of the superposition principle for the mind is well illustrated by one of the most famous thought experiments - often misunderstood - imagined by the physicist Erwin Schr dinger, one of the founding fathers of quantum formalism and winner of the 1933 Nobel Prize. The now famous "Schr dinger's Cat" consists in applying quantum rules to a classical object, precisely to show the limits and difficulties in interpreting the notion of quantum state and measurement.

Wave packet reduction and probabilities

The measurement (looking at the state of a particle) is indeed in itself another strangeness: it causes the definitive disappearance of the superposition. In other words, when we measure the state of a particle, it "chooses" one state and one state only (point A or point B, speed  $v_1$  or speed  $v_2$ ). This is called "wave packet reduction".

The "wave packet" or "wave function" in question are the different probabilities of the different states of a particle. Because, to add to the quantum weirdness, each superimposed state has a greater or lesser probability of being "realized" at the measurement.

For example, we can imagine a particle whose probability of being at the speed  $v_1$  is 70%, the probability of being at the speed  $v_2$  is 20% and the probability of being at the speed  $v_3$  is 10%. In this case, when 50 such particles are measured (all of which are in a superposed state prior to this measurement), statistically 35 particles will be found at  $v_1$ , 10 at  $v_2$ , and 5 at  $v_3$ .

Afterwards, a particle having been measured ("we say that its state has been projected or reduced", explains David Louapre), it remains in this "chosen" state, like an almost classical object one could say. Except that it has done so by following the laws of probability.

Quantum storage, classical reading

Quantum superposition is now the basis of quantum computing.

In quantum computing, a bit stores information according to the state, determined, in which it is (1 or 0). A quantum bit - or qbit - because of the principle of superposition is in an indeterminate state. It stores both a 1 and a 0.

This being the case, once the measurement of the qbit has been carried out (to make a calculation for example), it logically loses its superposed state. It is projected, or reduced. In short, the reading

destroys the quantum superposition.



### 3 Proof of Fermat's last theorem using tetravalent logic (Riyadh letter)

**Theorem (Fermat):** there are no strictly positive integers  $x, y$  and  $z$  such that  $x^n + y^n = z^n$  as soon as  $n > 2$ .

According to the Ummites, you have to follow the thought

$$1=1$$

$$0=0$$

$$1 \neq 0$$

$$0 \neq 1$$

and cross

$$1=0$$

$$0=1$$

$$1 \neq 1$$

$$0 \neq 0$$

That is to say to combine equalities / binary inequalities with tetravalent logic.

Do you understand what this means? We will prove the Fermat's last theorem by first showing heredity (true at rank  $n$  implies true at rank  $n+1$ ) thanks to tetravalent logic and finally the initialization of the proposition (the case  $n=3$  demonstrated by Euler).

Demonstration

In the tetravalent logic, there are 4 possibilities:

- strictly TRUE ( $1=1$ ), the set  $A \setminus (A \cap B)$ ;
- strictly FALSE ( $0=0$ ), the set  $B \setminus (A \cap B)$ ;
- TRUE and FALSE ( $1 \neq 0$  or  $0 \neq 1$ ), the set  $A \cap B$ ;
- neither TRUE nor FALSE ( $1 \neq 1$  and  $0 \neq 0$ ), the set  $X \setminus (A \cup B)$ ;

The sets  $A \setminus (A \cap B)$  and  $B \setminus (A \cap B)$  correspond respectively to the first two binary equalities  $1=1$  and  $0=0$ , while the sets  $A \cap B$  and  $X \setminus (A \cup B)$  correspond to the binary inequalities.

An assertion can be both TRUE and FALSE, in which case TRUE and FALSE coexist and are distinct ( $\text{TRUE} \neq \text{FALSE}$  or  $\text{FALSE} \neq \text{TRUE}$ ). An assertion can also be neither TRUE nor FALSE, in which case TRUE no longer makes sense and FALSE no longer makes sense ( $\text{TRUE} \neq \text{TRUE}$  and  $\text{FALSE} \neq \text{FALSE}$ ); the assertion is TRUE outside the universe. The blue circle set  $A$  on the Venn diagram represents all equations verifying  $1=1$ . The red circle  $B$  represents all equations verifying  $0=0$ . The equations verifying  $1=1$  and  $0=0$  are then included in both sets and thus correspond to the points located in the blue and red circle overlap (the set  $A \cap B$  in purple color which represents all equations verifying  $1 \neq 0$  or  $0 \neq 1$ ) because  $0=0$  and  $1=1$  is equivalent to  $0=0 \neq 1=1$  or  $1=1 \neq 0=0$  i.e.  $0 \neq 1$  or  $1 \neq 0$ . The other equations verifying  $1 \neq 1$  and  $0 \neq 0$  are located outside the set  $A \cup B$  ( $1=1$  or  $0=0$ ), i.e. the set  $X \setminus (A \cup B)$ .

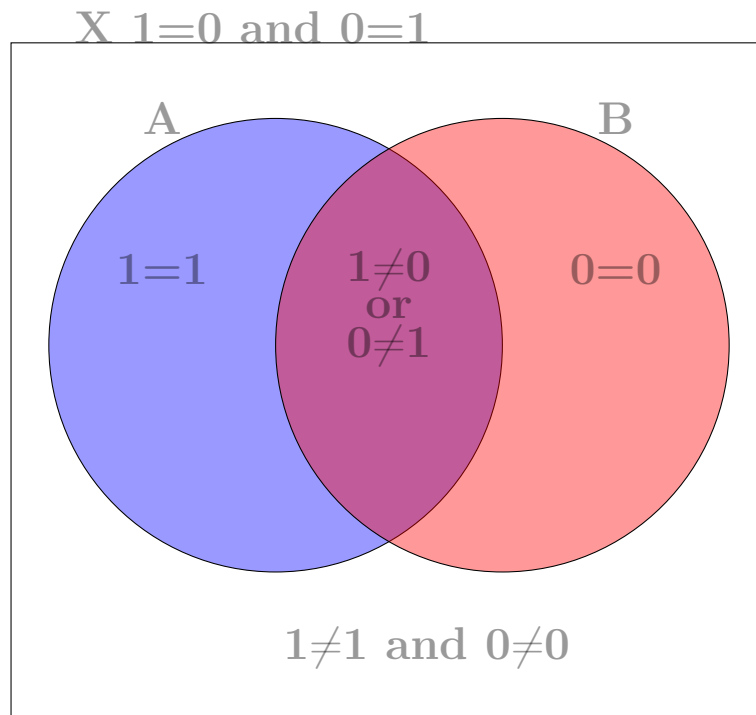
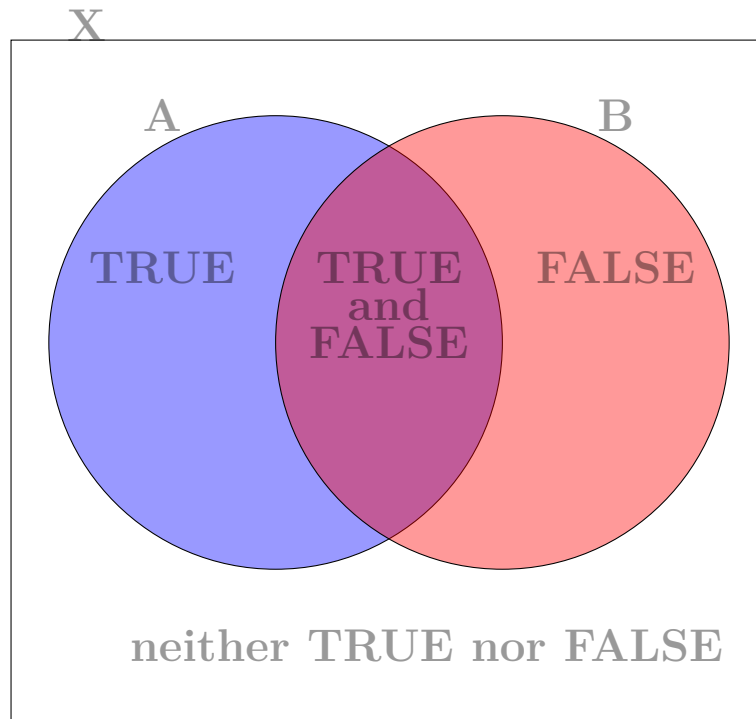
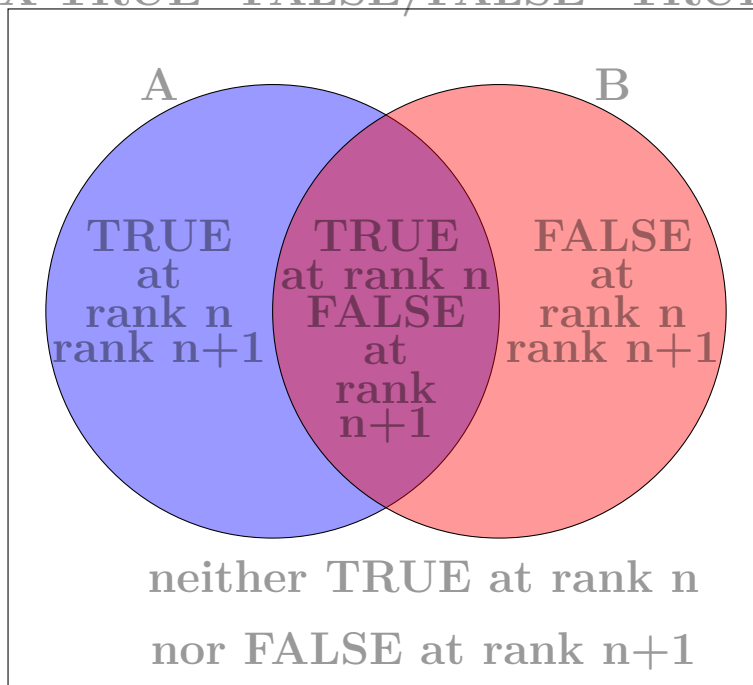


Table 4

Recurrence	
rank n	rank n+1
TRUE	TRUE
FALSE	FALSE
TRUE	FALSE
neither TRUE	nor FALSE

X TRUE=FALSE/FALSE=TRUE



We consider the copy of rank  $n$ : the rank  $n+1$ . The rank  $n$  is duplicated and the couple  $(n,n)$  becomes  $(n,n+1)$  which allows to exploit the tetravalence directly in the reasoning by recurrence on  $n$  (see Table 4). For example, (TRUE at rank  $n$ , FALSE at rank  $n$ ) becomes (TRUE at rank  $n$ , FALSE at rank  $n+1$ ), the rank  $n$  on the right is replaced by the rank  $n+1$ . The first step of the proof is to find an angular parametrization of the Fermat's equation with  $z=1$ . For  $n=1$ , we have  $x=\theta$ ,  $y=1-\theta$  and  $z=1$ . For  $n=2$ , we have  $x=\cos(\theta)$ ,  $y=\sin(\theta)$  and  $z=1$ . For  $n\geq 3$ ,  $x=\cos(\theta)^{2/n}$ ,  $y=\sin(\theta)^{2/n}$  and  $z=1$ . It is impossible to linearize this angular parametrization. Moreover the cases  $n=1$  and  $n=2$  are trivial because the solutions for  $n=1$   $(m, m, 2m)$  and for  $n=2$   $(m^2-1, 2m, m^2+1)$  where  $m$  is a strictly positive integer are known for a long time. The recurrence reasoning using tetravalent logic starts from  $n=3$  because there is no linear angular parametrization of the Fermat's equation from  $n=3$ . For  $n=1$ , if  $\theta=1$ ,  $x=1$  and  $y=0$  and vice versa if  $\theta=0$  and for  $n=2$ , if  $\theta=\frac{\pi}{2}$ ,  $x=0$  and  $y=1$  and vice versa if  $\theta=0$ , then we cannot simultaneously replace the binary variables  $x$  and  $y$

by 1. This problem does not exist for  $n \geq 3$  because the angular parametrization is not linear. So, for  $n \geq 3$  fixed we consider the binary Fermat's equation  $x^n + y^n = z^n$  where  $x, y$  and  $z \in \{0, 1\}$ , as we do not know if there is a solution, we replace all the binary variables by 1 to know the logical translation of Fermat's equation:  $1^n + 1^n = 1^n$  gives  $1 + 1 = 1$  (we subtract 1 from both sides) i.e.  $1=0$  and  $0=1$  (the two other binary equalities). As TRUE is assigned to the value 1 and FALSE to the value 0 in binary language, we have  $\text{TRUE} := \text{FALSE}$  and  $\text{FALSE} := \text{TRUE}$  for the Fermat's equation. So, we are going to be able to replace TRUE by FALSE and FALSE by TRUE in binary inequalities with tetrality, i.e. crossing equalities/binary inequalities with tetravalent logic.

Moreover when  $n \rightarrow +\infty$ ,  $x = r^{2/n} \cos(\theta)^{2/n}$ ,  $y = r^{2/n} \sin(\theta)^{2/n} \rightarrow 1$  and  $z = r^{2/n} \rightarrow 1$  ( $r \in \mathbb{R}$ ) and we find well  $1 + 1 = 1$ , i.e.  $1=0$  and  $0=1$  ( $\text{TRUE} := \text{FALSE}$  and  $\text{FALSE} := \text{TRUE}$ ). We replace all the binary variables by 1 to know the logical translation of Fermat's equation when  $n \rightarrow +\infty$ .

$$\begin{aligned} \lim_{\substack{a \rightarrow 1 \\ b \rightarrow +\infty}} a^b & \text{ is an indeterminate form but if you pose } a=1, \text{ we have } 1^{+\infty} = \lim_{n \rightarrow +\infty} e^{\ln(1^n)} = \lim_{n \rightarrow +\infty} e^{n \ln(1)} \\ & = \lim_{n \rightarrow +\infty} e^0 = 1. \end{aligned}$$

For  $n \geq 3$  fixed by replacing each monomial of the Fermat's equation by the result of its partial derivative operator  $\partial^m$  of order  $m$  (with  $m < n$ ), we find the Fermat's equation  $x^d + y^d = z^d$  of order  $d$ , where  $d = n - m$ , we have again  $1 + 1 = 1$  ( $\text{TRUE} := \text{FALSE}$  and  $\text{FALSE} := \text{TRUE}$ ).

Boolean algebra, or Boolean calculus, is the part of mathematics concerned with an algebraic approach to logic, seen in terms of variables, operators, and functions on logical variables, which allows the use of algebraic techniques to deal with two-valued expressions in calculus. Here TRUE is assigned to the equality  $1=1$  and the value 1, similarly FALSE is assigned to the equality  $0=0$  and the value 0. "TRUE and FALSE" is assigned to the inequality  $1 \neq 0$  or  $0 \neq 1$  ( $\text{TRUE} \neq \text{FALSE}$  or  $\text{FALSE} \neq \text{TRUE}$ ; FALSE and TRUE coexist by being different ) and "neither TRUE nor FALSE" is assigned to the inequalities  $1 \neq 1$  and  $0 \neq 0$  ( $\text{TRUE} \neq \text{TRUE}$  and  $\text{FALSE} \neq \text{FALSE}$ ; FALSE and TRUE have no meaning anymore, it's TRUE outside the UNIVERSE). Replacing all the variables in the Fermat's equation with  $1 = \text{TRUE}$ , we find  $1 + 1 = 1$  i.e.  $(1-1) + 1 = (1-1) = 0$  or  $1 = 0$  (or  $0 = 1$ ); this logical relation  $\text{TRUE}(=1) = \text{FALSE}(=0)$  is TRUE/VALID ( $x = y = z = 1 = \text{TRUE}$ ) for any assertion of Fermat's equation with non-zero positive  $x, y$  and  $z$  variables, non-zero because it is no longer true if all variables are zero, we have  $0 + 0 = 0$  i.e.  $0 = 0$ . So we can cross  $1 = 0$  or  $0 = 1$  with the 4 values of the tetravalent logic only for integers greater than or equal to 1. We assume that the proposition is TRUE at rank  $n$ , and we want to show that it is also TRUE at rank  $n + 1$ . There are 4 possibilities in the tetravalent logic (see Table 4) transcribed in the recurrence reasoning on  $n$ :

- TRUE at rank  $n$ , TRUE at rank  $n + 1$ ;
- FALSE at rank  $n$ , FALSE at rank  $n + 1$ ;
- TRUE at rank  $n$ , FALSE at rank  $n + 1$ ;
- neither TRUE at rank  $n$ , nor FALSE at rank  $n + 1$ ;

The case neither TRUE at rank  $n$ , nor FALSE at rank  $n + 1$  is impossible because TRUE = FALSE for Fermat's equation and for this case  $\text{TRUE} \neq \text{TRUE}$ , so  $\text{TRUE} \neq \text{TRUE} = \text{FALSE}$  and therefore TRUE  $\neq$  FALSE (absurd).

The case FALSE at rank  $n$ , FALSE at rank  $n + 1$  is contrary to the induction hypothesis TRUE at rank  $n$  (impossible because we assume that the proposition is TRUE at rank  $n$ ) and becomes TRUE at rank  $n$ , TRUE at rank  $n + 1$  using  $\text{FALSE} := \text{TRUE}$  for Fermat's equation.

It remains the case (TRUE at rank  $n$ , FALSE at rank  $n+1$ ) which becomes (FALSE at rank  $n$ , TRUE at rank  $n+1$ ) using  $\text{TRUE}:=\text{FALSE}$  and  $\text{FALSE}:=\text{TRUE}$  for Fermat's equation. The case TRUE at rank  $n$ , FALSE at rank  $n+1$  implicitly implies that  $\text{TRUE}\neq\text{FALSE}$  because TRUE and FALSE coexist (absurd because  $\text{TRUE}=\text{FALSE}$  for Fermat's equation) and the permutation (TRUE,FALSE) to (FALSE,TRUE) is impossible because it is contrary to the induction hypothesis TRUE at rank  $n$ . Finally, it remains the case TRUE at rank  $n$ , TRUE at rank  $n+1$  and the proposition is hereditary.  $\text{TRUE}:=\text{FALSE}$  and  $\text{FALSE}:=\text{TRUE}$  gives the pair (TRUE,TRUE)=(FALSE,FALSE), which means that if it is TRUE at rank  $n$ , it is TRUE at rank  $n+1$ , and the same if it is FALSE at rank  $n$ , it is FALSE at rank  $n+1$  so the proposal is hereditary in all cases. It remains to prove the initialization of the recurrence, i.e. the case  $n=3$  (Euler). The case  $n=3$  is solved by normal arithmetic, and thus there we return to the bivalent logic TRUE or FALSE which will give the color of the heredity TRUE for all  $n\geq 3$  or FALSE for all  $n\geq 3$ .

For this, we use two lemmas to demonstrate the case  $n=3$ .

**Lemma 1**

**if  $x^3 + y^3=z^3$ , one of the integers  $x$ ,  $y$  or  $z$  is divisible by 3.**

**Lemma 2**

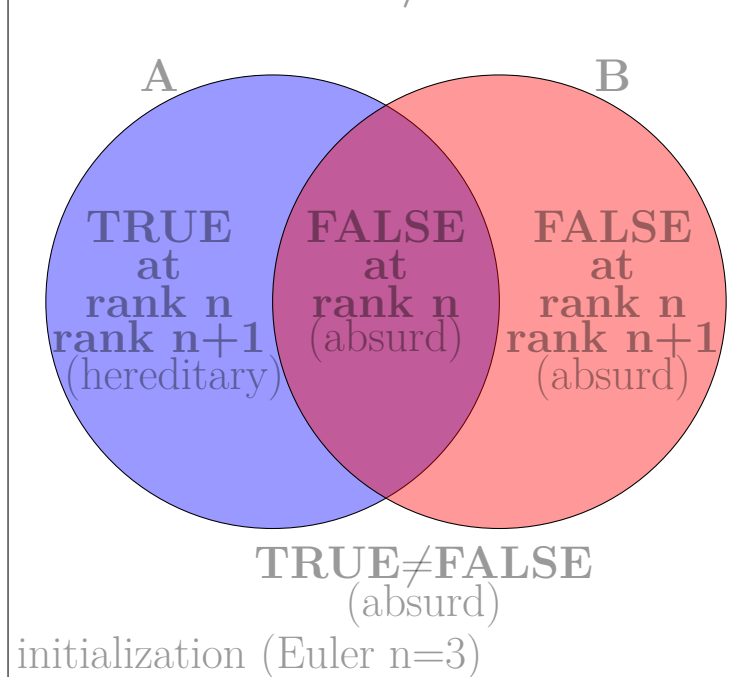
**if two integers  $x$  and  $y$  prime between them are such that  $x^2 + 3y^2$  is a cube  $z^3$ , then there are two integers  $n$  and  $m$  prime between them such that  $x + iy\sqrt{3} = (n + im\sqrt{3})^3$ , which gives:  $x = n^3 - 9nm^2$ ,  $y = 3n^2m - 3m^3$ ,  $z = n^2 + 3m^2$ .**

We find the demonstration in [Weil] and in [Guinot 3] pages 124 to 126.

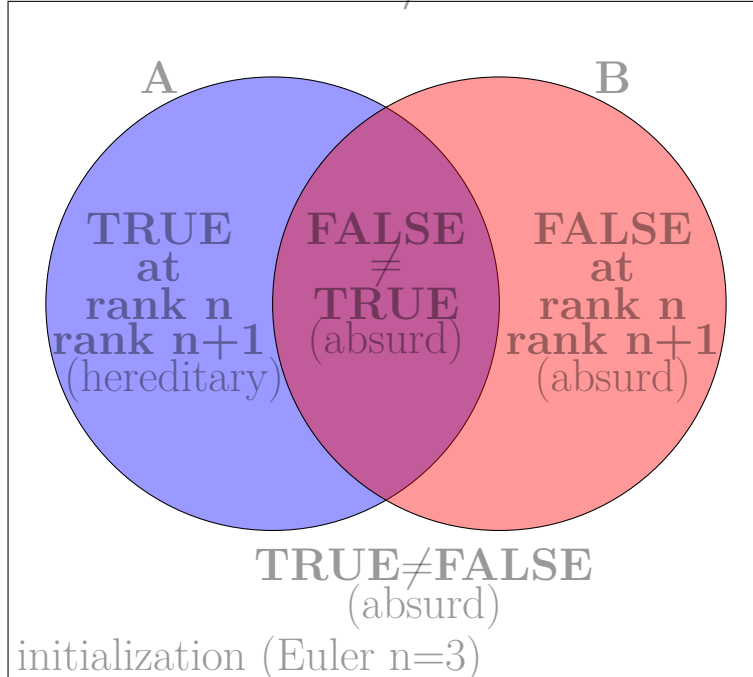
**Theorem ( $n=3$ ): The equation  $(E_3) x^3 + y^3 = z^3$  has no solution in non-zero integers, or in English: the sum of two non-zero cubes cannot be a cube.**

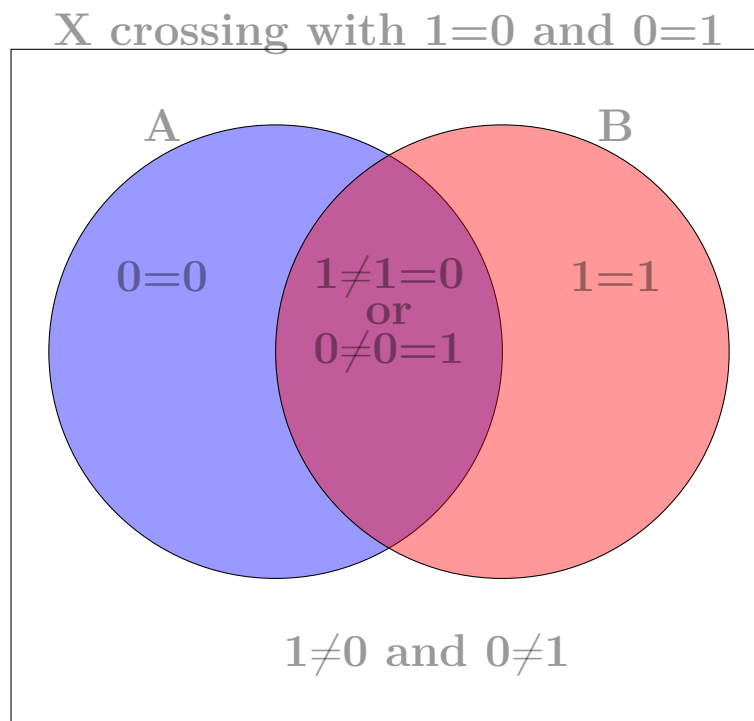
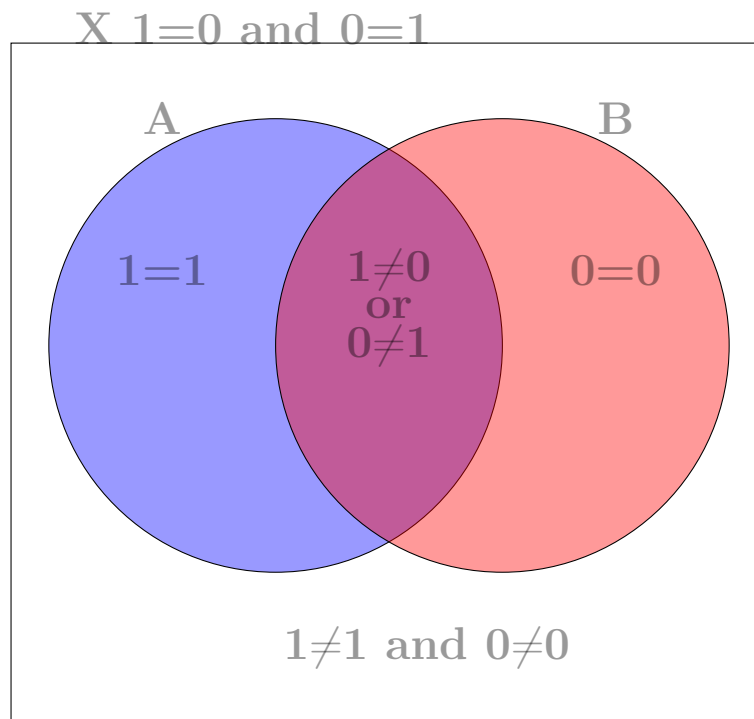
Consider a possible solution  $x, y, z$  to this equation. The first idea is to use the fact that  $x+y$  divides  $x^3+y^3$ , therefore  $z^3$ . Notice before that  $(E_3)$ , which can be written  $x^3 + y^3 + (-z)^3=0$  is symmetric in  $x, y, -z$ . And as usual, we come back to the case where  $x, y, z$  are two to two prime between them. We can easily see that one of the integers is necessarily even and the other two odd. If, for example,  $z$  is odd (and this does not restrict the generality according to the symmetry remark above),  $u = \frac{x+y}{2}$  and  $v = \frac{x-y}{2}$  are non-zero relative integers prime to each other. Since  $x = u + v$  and  $y = u - v$ ,  $u$  and  $v$  are of opposite parities. The Equation  $(E_3)$  becomes in  $u$  and  $v$ :  $2u(u^2 + 3v^2)=z^3$ . If first of all,  $u$  is not a multiple of 3, we can easily see that  $2u$  and  $u^2 + 3v^2$  are prime to each other and therefore,  $2u$  and  $u^2 + 3v^2$  are cubes  $t^3$  and  $w^3$ . We see that the auxiliary equation of Lemma 2 appears. By Lemma 2,  $u=n^3 - 9nm^2=n(n-3m)(n+3m)$ ,  $v=3n^2m - 3m^3 = 3m(n-m)(n+m)$ ,  $w=n^2 + 3m^2$ .  $2n(n-3m)(n+3m)$  is therefore a cube; it remains to verify that  $2n, n-3m$  and  $n+3m$  are two by two prime between them. We notice that since  $u$  and  $v$  are prime to each other and of opposite parities,  $n$  and  $m$  are prime to each other and of opposite parities. On the other hand,  $n$  is not a multiple of 3 because otherwise  $u$  would be. So  $2n, n-3m$  and  $n+3m$  are two-prime between them, and they are therefore cubes  $z'^3, x'^3, y'^3$  verifying  $x'^3 + y'^3 = z'^3$ . We have therefore found a solution in non-zero integers  $(x', y', z')$  of  $(E'_3)$ . But  $|x'y'z'|^3=2|u|=|x+y|$  is a divisor of  $|x^3 + y^3|=|z|^3$ , so  $|x'y'z'| \leq |z| < |xyz|$ . It remains to see what happens if  $u$  is a multiple of 3, in this case  $v$  is not because  $u$  and  $v$  are coprime. We then write  $u = 3w$ , hence  $18w(v^2 + 3w^2)$  is a cube and we still see that  $18w$  and  $v^2 + 3w^2$  are prime to each other so  $18w$  and  $v^2 + 3w^2$  are cubes. In the same way as previously, we deduce a new solution  $(x'', y'', z'')$  of  $(E'_3)$  verifying  $0 < |x''y''z''| < |x'y'z'| < |xyz|$ . But this is absurd by the argument of infinite descent.

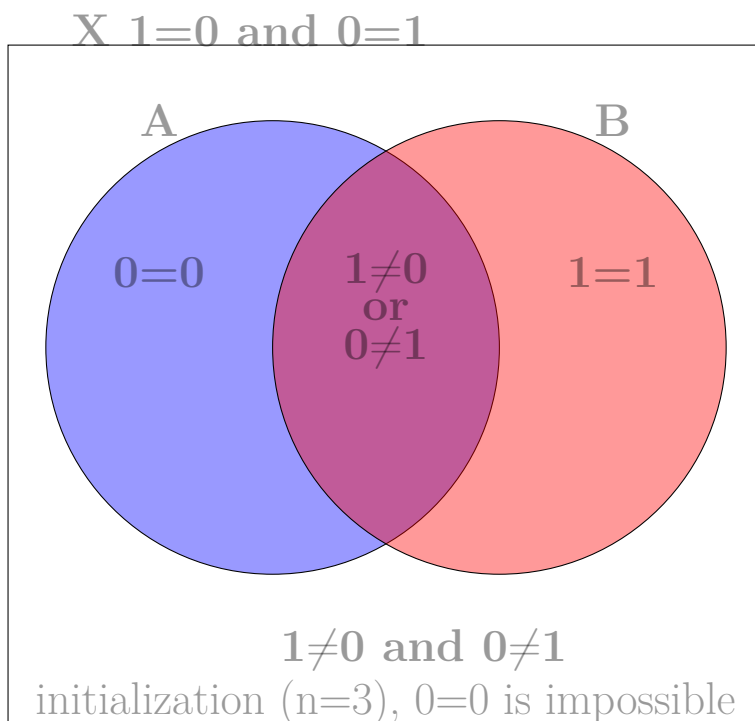
~~X TRUE=FALSE/FALSE=TRUE~~



~~X TRUE=FALSE/FALSE=TRUE~~







The crossing of equalities  $1=0$  and  $0=1$  and binary inequalities (in purple and white) is represented by the Venn diagrams below.

Disjointed binary inequalities  $1 \neq 1$  and  $0 \neq 0$  become intricate inequalities  $1 \neq 0$  and  $0 \neq 1$  thanks to the crossing with equalities  $1=0$  and  $0=1$  (binary and algebraic equalities) that arise directly from the Fermat's equation, which is why the Ummites talk about crossing binary equalities/inequalities. Intricate binary inequalities  $1 \neq 0$  and  $0 \neq 1$  are absurd because they contradict the binary equalities specific to the Fermat's equation:  $1=0$  and  $0=1$ . The binary equalities  $1=1$  and  $0=0$  are compatible with the binary equalities  $1=0$  and  $0=1$ , we can go from one to the other by replacing 1 by 0 and 0 by 1 as we did before. So there remain the two binary equalities  $1=1$  which means TRUE at rank  $n$  and at rank  $n+1$ , and  $0=0$  which means FALSE at rank  $n$  and at rank  $n+1$ .

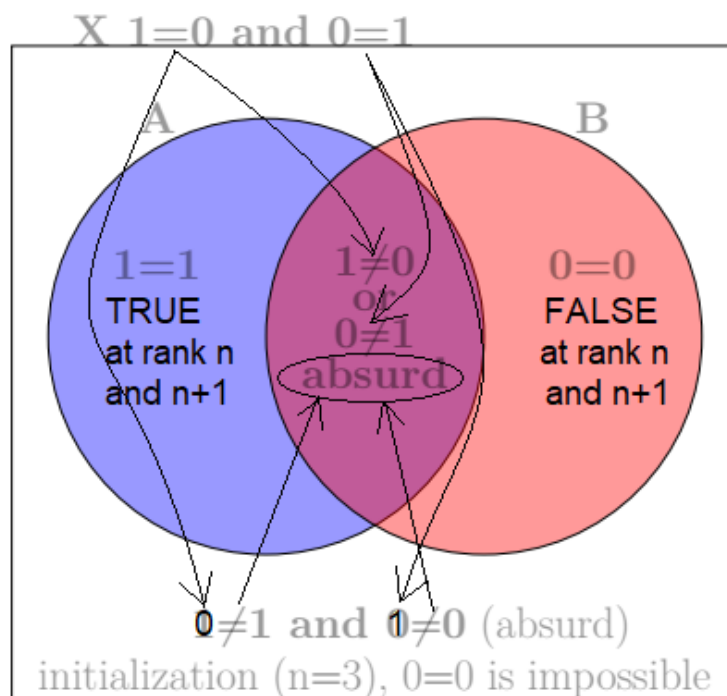
There are only two possible cases: TRUE at rank  $n$  implies TRUE at rank  $n+1$ , or FALSE at rank  $n$  implies FALSE at rank  $n+1$ . Now we know that the case  $n=3$  was demonstrated by Leonhard Euler in 1753, Euler transforms the equation into  $z^3 = x^3 + y^3 = 2a(a^2 + 3b^2)$ . The study of the properties of numbers of the form  $a^2 + 3b^2$  was omitted from his proof. The same omission will be taken up by Legendre.

Without knowing it Euler had already proved Fermat's last theorem, because if it is TRUE for  $n=3$ , necessarily, it is TRUE for  $n=4$ , so TRUE for  $n=5$  etc... until  $n=+\infty$ .

This time it is in Switzerland that we have to go and find a first demonstration. Leonhard Euler was born in 1706 in Basel and spent a large part of his life in Russia. He died in 1783 in Saint Petersburg. He is one of the greatest mathematicians of his time and even of all times. We owe him a great part of the modern notations, among others about functions, results in arithmetic, analysis, mechanics, astronomy.

It is in fact in Saint-Petersburg that Leonhard Euler proved Fermat's theorem in the case  $n=3$ .





Unfortunately, he made a historical error in his reasoning, since it led to one of the most important theories of the 19th century on algebraic integers.

For this demonstration, Euler uses Fermat's method of infinite descent. Without going into the details that you can read here, Euler uses in this demonstration numbers in the form  $a+bi\sqrt{3}$  where  $a$  and  $b$  are integers and  $i$  the imaginary number whose square is  $-1$ .

These numbers behave a bit like integers: we can add them, multiply them.

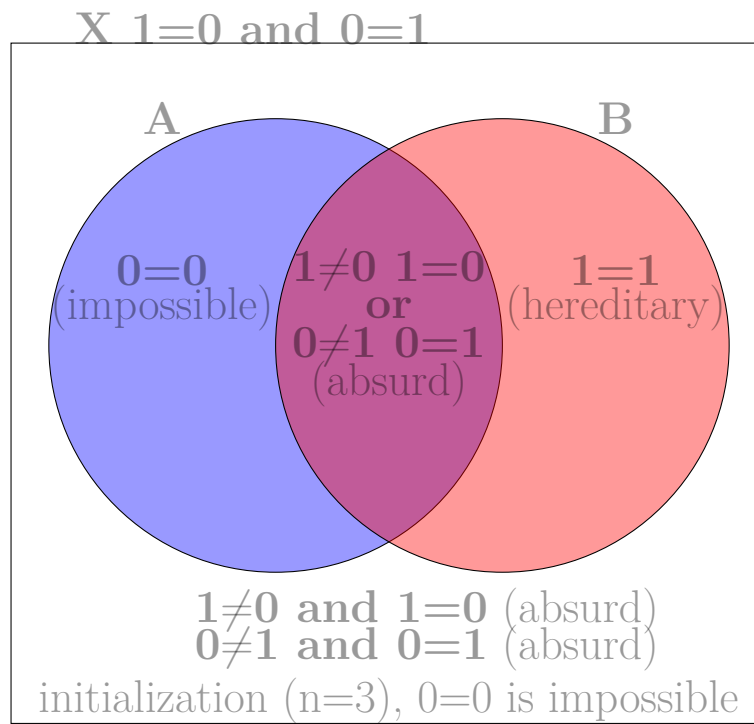
$$(1+i\sqrt{3})(2+3i\sqrt{3})=2+3i\sqrt{3}+2i\sqrt{3}-3\times 3=-7+5i\sqrt{3}.$$

This set is called in modern mathematics a ring, we even say that it is the ring of Gaussian integers in homage to another mathematician about whom we will speak later.

Euler's mistake was to think that these numbers can be uniquely decomposed into prime factors like the classical integers. But this is not true for the Gauss integers:  $4=2\times 2=(1+i\sqrt{3})(1-i\sqrt{3})$ .

This lack of rigor of Euler is certainly a consequence of his mathematical power that reveals his extraordinary imagination and inventive spirit. He was able to see new connections between problems and this idea of factoring numbers using complex numbers is simply brilliant. By reshuffling his demonstration a little we manage to treat the case  $n=3$ , see for that this reference. This mistake had the merit to allow the mathematicians of the XIXth century to work on these rings of integers so particular. The notions of factorial rings, Euclidean rings... have emerged from this colossal work.

Conclusion: Thanks to tetravalent logic, we have heredity of Fermat's proposition, and thanks to Euler, we have the initialization ( $n=3$ ), it's finished, the Fermat's last theorem is proved.



Reminder: The method of infinite descent is a mathematical argument close to reasoning by recurrence, but also to reasoning by the absurd, which uses the fact that a strictly decreasing sequence of natural numbers is necessarily finite.

The mathematical proof of the TRUE extraterrestrial origin of the Ummites ?

## 4 Existence of a twin universe and non-existence of black holes

We demonstrate the existence of the twin universe by doing the same reasoning of tetravalent logic on the mass of the twin universe  $m^{twin}$  which can be zero ( $m^{twin}=0$ ) and not zero ( $m^{twin} \neq 0$ ) simultaneously as the Ummites suggest in their letters. We denote by  $\mathbf{m}$  the mass of our universe and  $\mathbf{m}^{twin}$  the mass of the twin universe **in absolute value** (knowing that both necessarily have the same mass  $m^{twin}=\mathbf{m}$  so that tetravalent reasoning can work by replacing the mass of the twin universe with the same mass of our universe, see Tables 5,6). In the tetravalent logic, there are 4 possibilities:

- $m^{twin}=0$  and  $\mathbf{m}^{twin} =0$ , the set  $A \setminus (A \cap B)$ ;
- $m^{twin} \neq 0$  and  $\mathbf{m}^{twin} \neq 0$ , the set  $B \setminus (A \cap B)$ ;
- $m^{twin}=0$  and  $\mathbf{m}^{twin} \neq 0$ , the set  $A \cap B$ ;
- neither  $m^{twin}=0$  nor  $\mathbf{m}^{twin} \neq 0$ , the set  $X \setminus (A \cup B)$ ;

which is equivalent to the following 4 inequalities by dividing the couple  $(m^{twin}, \mathbf{m}^{twin})$  into  $(m^{twin}, \mathbf{m})$  since the two twin universes have the same mass  $\mathbf{m}=\mathbf{m}^{twin}$ :

- $m^{twin}=0$  and  $\mathbf{m}=0$ , the set  $A \setminus (A \cap B)$ ;
- $m^{twin} \neq 0$  and  $\mathbf{m} \neq 0$ , the set  $B \setminus (A \cap B)$ ;
- $m^{twin}=0$  and  $\mathbf{m} \neq 0$ , the set  $A \cap B$ ;
- neither  $m^{twin}=0$  nor  $\mathbf{m} \neq 0$ , the set  $X \setminus (A \cup B)$ ;

We consider a copy of the mass  $m^{twin}$ , which we call  $\mathbf{m}$  in the reasoning with tetravalent logic zero and non-zero mass of the twin universe. The tetravalent logic describes the real in a complete way, it works only by considering a variable "copy" of the variable of departure, therefore the two have the same value  $\mathbf{m}=\mathbf{m}^{twin}$ . Thanks to this splitting of terms, we will eliminate all cases where the mass of the twin universe mass is zero. Therefore, as the mass of the twin universe is non-zero, it does exist. The bivalent logic would not have allowed to eliminate the case where the mass of the twin universe is null, it is precisely the duplication of term with the copy of the mass of the twin universe which is the mass of our universe, which allows to eliminate the cases null/non-zero mass and mass neither null, nor not null.

For Fermat's theorem, the copy of rank  $n$  was rank  $n+1$ . The rank  $n$  is duplicated and the couple  $(n,n)$  becomes  $(n,n+1)$  which allows to exploit the tetravalence directly in the reasoning by recurrence on  $n$ . The case TRUE and FALSE at rank  $n$  becomes TRUE at rank  $n$  and FALSE at rank  $n+1$  and the case neither TRUE nor FALSE at rank  $n$  becomes neither TRUE at rank  $n$  nor FALSE at rank  $n+1$  which will allow to discard the non-heredity of the proposition.

Here it is the case where the mass of the twin universe is null with the mass of our universe not null which is discarded and the case where the mass of the twin universe neither null nor the mass of our universe not null which is discarded too.

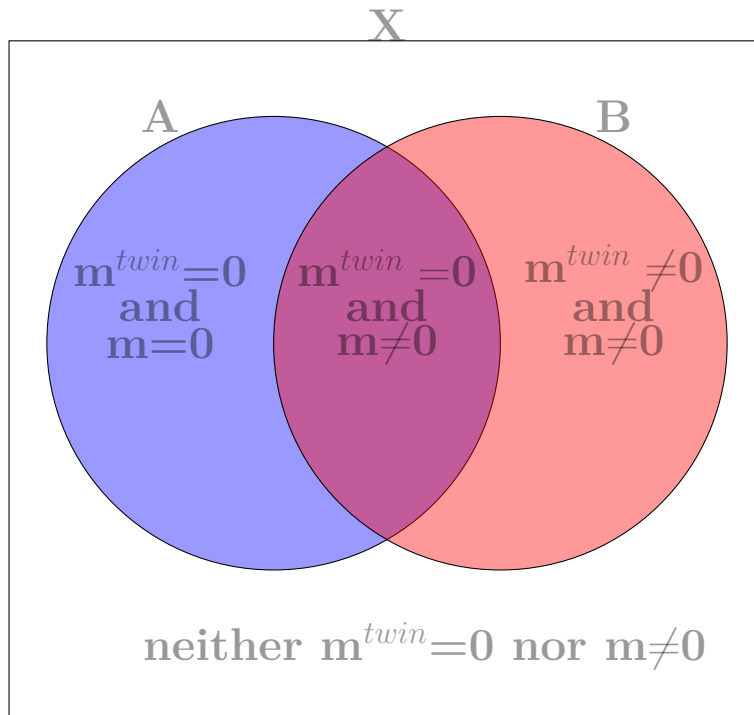
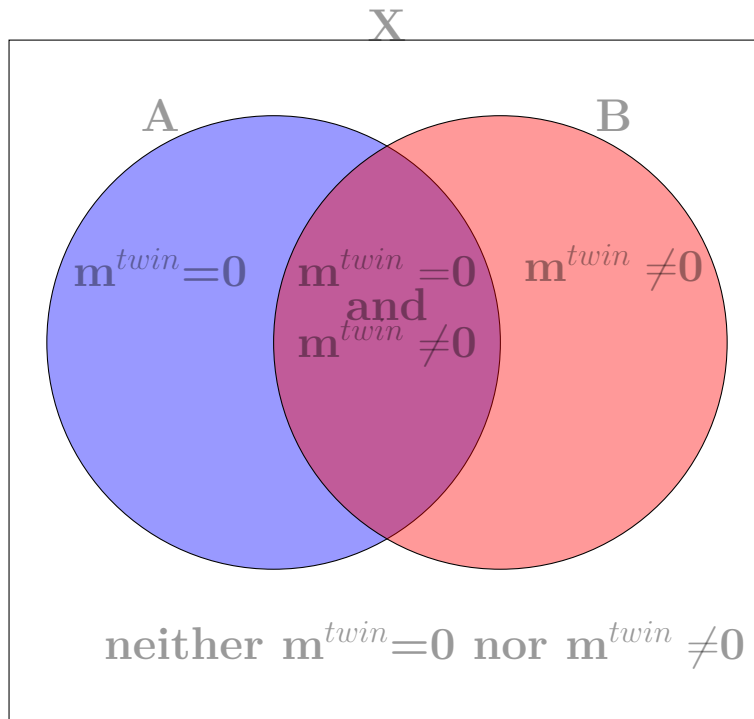


Table 5

Reasoning	
twin universe	twin universe
$m^{twin}=0$	$m^{twin}=0$
$m^{twin} \neq 0$	$m^{twin} \neq 0$
$m^{twin}=0$	$m^{twin} \neq 0$
neither $m^{twin}=0$	nor $m^{twin} \neq 0$

Table 6

Reasoning	
twin universe	our universe
$m^{twin}=0$	$m=0$
$m^{twin} \neq 0$	$m \neq 0$
$m^{twin}=0$	$m \neq 0$
neither $m^{twin}=0$	nor $m \neq 0$

But here we don't use the binary equalities/inequalities crossing of Fermat's theorem because it is not a proposition or a conjecture to be proved which concerns the roots of an equation to be solved, we don't have  $1=0$  and  $0=1$ , and anyway the case where the two masses are null is immediately absurd, so the trick is to look for a contradiction in the cases: NULL/NON NULL and NEITHER NULL/ NOR NON NULL.

TETRAVALENT LOGIC with  $m^{twin}=m$  in the case where the twin universe exists (corresponds to the set  $B \setminus (A \cap B)$  in red color). In the case where the twin universe does not exist, the mass  $m^{twin}$  is zero and not zero (corresponds to the set  $A \cap B$  in purple color on the first Venn diagram).

A Venn diagram (also called a logic diagram) is a diagram that shows all possible logical relationships in a finite collection of different sets. Venn diagrams were designed around 1880 by John Venn. They are used to teach elementary set theory, as well as to illustrate simple relationships in probability, logic, statistics, linguistics and computer science.

This example is composed of two sets A and B, represented here as colored circles. The blue circle, set A, represents all universes of zero mass. The red circle, set B, represents all universes of non-zero mass. Each distinct type of universe can be imagined as a point in this diagram. The zero and non-zero mass universes, for example, are then included in both sets, and thus correspond to the points located in the region where the blue and red circles overlap. Our universe has a non-zero mass, so it is in the blue circle, but as it cannot be zero mass, it appears in the left part of the blue circle, where it does not overlap with the pink circle. The universes that are not zero mass, and are not non-zero mass are all represented by points outside the two circles (TRUE outside the WAAM). The combined region of sets A and B is called the union of A and B, denoted  $A \cup B$ . The union in this case contains all universes that are either zero mass, non-zero mass, or both. The region A and B, where the two sets overlap, is called the intersection of «A and B» at the same time, and is denoted  $A \cap B$ . For example, the intersection of the two sets is non-empty (purple region), because there are points that represent universes that are both located in the red circle and in the blue

circle, e.g. the hypothetical twin universe can have zero and non-zero mass, because considering  $m=m^{twin} \neq 0$  and  $m^{twin}=0$ , we arrive at non-existence of the twin universe (corresponds to the set  $A \cap B$  in purple color on the second Venn diagram, i.e.  $m \neq 0$  and  $m^{twin}=0$ ), and considering  $m^{twin} \neq 0$ , we have the existence of the twin universe (corresponds to the set  $B \setminus (A \cap B)$  in red color on the second Venn diagram, i.e.  $m \neq 0$  and  $m^{twin} \neq 0$ ).

We have the following reasoning by the tetravalent absurd which uses the fact that the twin universe has the same mass and the existence of a gravitational singularity when a giant star collapses.

1. If  $m=0$  and  $m^{twin}=0$ , we would not exist (absurd).
2. If  $m \neq 0$  and  $m^{twin}=0$  then the mass of the neutron star which collapses on itself stays in our universe (absurd because nothing can escape from a « black hole » due to gravitational singularity).
3. The case neither  $m^{twin}=0$  nor  $m \neq 0$  is impossible because the mass of our universe is non-zero and if all the mass of our universe  $m$  is transferred into the twin universe, we have  $m=0 \neq m^{twin}$  (impossible because  $m=m^{twin}$  in the reasoning).
4. It remains the case  $m^{twin} \neq 0$  and  $m \neq 0$ .

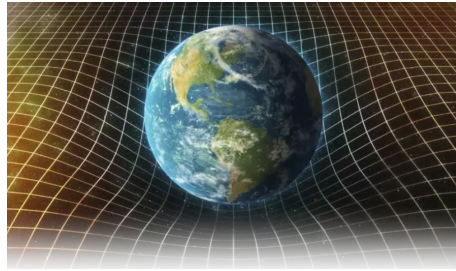
Conclusion: We have demonstrated the existence of a twin universe which has the property of being adjacent to ours in extreme gravity conditions and of the same mass as ours. Black holes are in fact porous boundaries between the two adjacent universes where the mass of the collapsed star is transferred to the twin universe. This mass can only be negative in the twin universe because the space-time distortion caused by a massive object of mass  $M$  is a trough in our universe, but is also a bump for the twin universe.  $M$  in our universe is transferred to the collapse of the neutron star and becomes  $-M$  in the other universe. A network of angles internal to the mass has its axis changing direction, so the mass  $M$  which is assimilated to a sum  $\Theta$  of a large number of angles  $M:=\Theta$  takes the opposite sign and becomes  $-M$  (i.e.  $M=-\Theta$  in the other universe, rotation of angle  $\pi$  of the internal axis). The energy corresponding to the collapsed star is worth  $i\sqrt{\Theta}.c$  (where  $c$  is the speed of light and  $i=\sqrt{-1}$ ), it is an imaginary energy in the twin universe.

The mass of our universe decreases  $m^{new}=m-M$  and that of the twin universe  $m^{twin,new}=m^{twin}+(-M)=m^{twin}-M=m^{new}$  also decreases by the same amount so that the two universes always have the same mass (in absolute value). Thus the balance and the conservation of energy between the two universes is respected ( $e^{new}=e^{twin,new}=m^{twin,new}c^2=m^{new}c^2$ ) and the tetravalent reasoning on the zero/non-zero mass of the twin universe works.

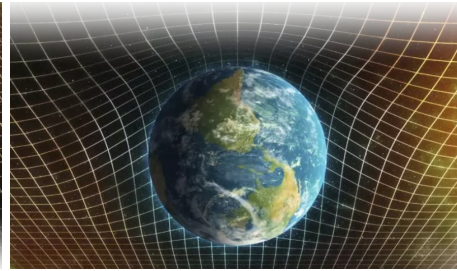
The black holes do not exist, they are border effects between the two universes.

We will demonstrate later that the two twin universes are hyperspheres of negative radius of curvature and have the same radius. The arrow of the time of the twin universe is oriented in the opposite direction to that of our universe because the physical equations are time reversible i.e. both directions of time are admissible (see trigonometric circle). A circle can be traversed in two ways: clockwise and its opposite direction, counterclockwise. An angle  $\alpha$  clockwise becomes  $-\alpha$  clockwise, called counterclockwise.

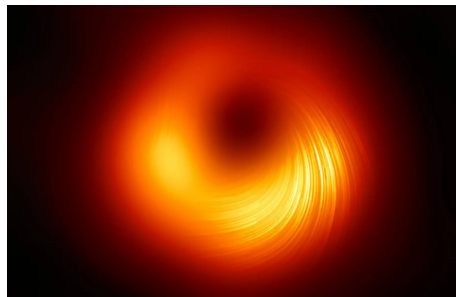
The Schwarzschild metric represents the space-time around a single mass body of revolution without a moment of inertia. It has become an irreplaceable tool for describing the behavior of planets, satellites or asteroids around stars. In what follows, when we use the term star or black hole, it will refer to the central body responsible for the curvature of space-time described by the



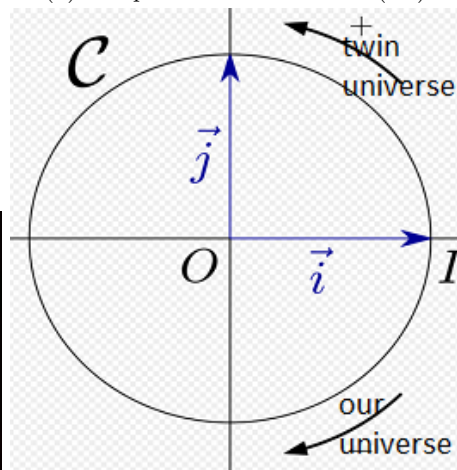
(a) trough in our universe (+M)



(b) bump in the twin universe (-M)



(c) border window between our universe and the twin universe (galaxy M87)



(d) both directions of time on a trigonometric circle (+ =anti-clockwise, -=clockwise)

FIGURE 2: Illustration of the pair of twin universes

metric. When we use the term massive body or particle, it will mean a body evolving in space-time thus defined and whose mass can be considered as negligible compared to (therefore without effect on the metric). The Schwarzschild metric is written:

$$ds^2 = \left(1 - \frac{2GM}{rc^2}\right) c^2 dt^2 - \left(1 - \frac{2GM}{rc^2}\right)^{-1} dr^2 - r^2 d\theta^2 - r^2 \sin^2 \theta d\phi^2 \quad (1)$$

$$ds^2 = \left(1 - \frac{R_s}{r}\right) c^2 dt^2 - \left(1 - \frac{R_s}{r}\right)^{-1} dr^2 - r^2 d\Omega^2 \quad (1R)$$

where  $(ct, r, \theta, \phi)$  being the four coordinates chosen to parameterize it (space-time coordinates where  $t$  is the time coordinate of an event point and  $r$ ,  $\theta$  and  $\phi$  its three space coordinates:  $t$  is the time coordinate at which the point is considered (measured by a clock located at an infinite distance from the massive object),  $r$  is the radial coordinate of the point (measured as the circumference, divided by  $2\pi$ , of the sphere centered on the massive object and passing through the point,  $\theta$  and  $\phi$  are the two angular coordinates of the point on the sphere of radius  $r$ ,  $\theta$  is the colatitude of the point (in radians) and  $\phi$  is the longitude of point (in radians)),  $ds$  is the space-time interval of an infinitesimal displacement  $(dt, dr, d\theta, d\phi)$  from point M on the sphere of radius  $r$  (see FIGURE 5),  $G$  is the gravitational constant,  $c$  is the speed of light,  $M$  is the mass of the object,  $R_s = \frac{2GM}{c^2}$  is the Schwarzschild radius associated with the massive object and  $d\Omega^2 = d\theta^2 + \sin^2 \theta d\phi^2$ . It is represented by the diagonal metric tensor  $g_{\mu\nu}$ :

$$\begin{pmatrix} \left(1 - \frac{2GM}{rc^2}\right) & 0 & 0 & 0 \\ 0 & -\left(1 - \frac{2GM}{rc^2}\right)^{-1} & 0 & 0 \\ 0 & 0 & -r^2 & 0 \\ 0 & 0 & 0 & -r^2 \sin^2 \theta \end{pmatrix} \quad (2)$$

$$\begin{pmatrix} 1 - \frac{R_s}{r} & 0 & 0 & 0 \\ 0 & -\left(1 - \frac{R_s}{r}\right)^{-1} & 0 & 0 \\ 0 & 0 & -r^2 & 0 \\ 0 & 0 & 0 & -r^2 \sin^2 \theta \end{pmatrix} \quad (3)$$

The Schwarzschild metric is static: the coordinates  $(r, \theta, \phi)$  form a set of spatial coordinates that do not depend on the temporal coordinate  $t$ . They are reminiscent of the spherical coordinates that we use in Euclidean geometry to represent the position of a point on a sphere. They are also assimilated to these coordinates when  $r$  is large in front  $R_s$ . An observer far from the center of symmetry of the metric does not perceive a difference between the geometry described by the Schwarzschild metric and Euclidean geometry in spherical coordinates. It is often said that coordinates  $(t, r, \theta, \phi)$  are the coordinates seen by a distant observer.

This formula, like all popularization formulas, has its limits. The Schwarzschild metric deviates notably from the Euclidean metric as soon as  $r$  tends towards  $R_s$ . In particular, it is no longer possible to define the spatial distance between the center of symmetry and a point of coordinates  $(t, r, \theta, \phi)$ : the quantity  $ds^2$  diverges at the center of symmetry and for  $r = R_s$ . However, we can notice that the circumference of a circle whose center coincides with the center of symmetry is equal to  $2\pi r$  whatever  $r$ . Although the radius of such a circle is not defined in the sense of the metric, can be considered by a distant observer as the apparent radius of this circle. All the more reason to regard coordinates  $(t, r, \theta, \phi)$  as the coordinates seen by a distant observer.

case  $M=0$

If  $M=0$ , the Schwarzschild metric reduces to that of Minkowski. The diagonal metric tensor  $g_{\mu\nu}$



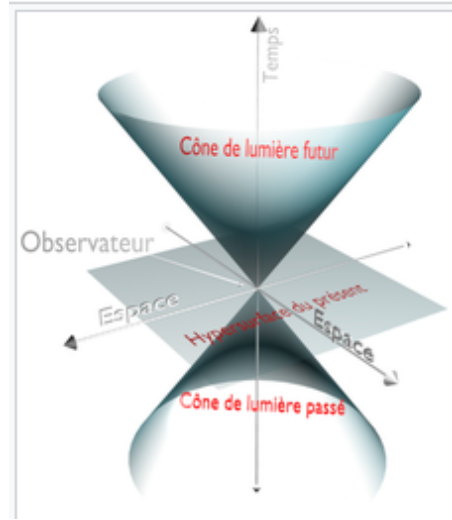


FIGURE 3: Schematic representation of Minkowski's space, which shows only two of the three spatial dimensions.

then simplifies to:

$$\begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & -1 & 0 \\ 0 & 0 & 0 & -1 \end{pmatrix} \quad (4)$$

case  $M < 0$

If  $M < 0$ , the singularity of the metric at  $r=0$  is a naked singularity.

A naked singularity, on the other hand, would be observable from the outside.

case  $M > 0$

If  $M > 0$ , the metric is singular at  $r=R_s=\frac{2GM}{c^2}$ . It's the singularity located inside a BORDER EFFECT (archaic erroneous term black hole), which is hidden by the horizon from which the gravitational force bends space-time enough that even light cannot escape. Therefore, objects within the event horizon, including the singularity itself, cannot be observed directly.

Suppose that the entire mass  $M$  is included within a sphere of radius  $R_s$ . The sphere of radius  $r=R_s$  has quite special properties. We can see that the coordinates  $t$  and  $r$  play a symmetrical role on either side of this surface. Outside the sphere, an interval defined by  $(dt, 0, 0, 0)$  is of type time while an interval defined by  $(0, dr, 0, 0)$  is of type space. Within the sphere, the roles are reversed. An interval  $(dt, 0, 0, 0)$  is a distance (like a space) while an interval  $(0, dr, 0, 0)$  is a duration (like a time). In fact, it is impossible to remain motionless at a point with constant  $r$ : the corresponding value of  $ds^2$  is negative (see equation (1R)). However, when we cross the limit of the sphere,  $dr$  is negative. So it remains until the end. Any body that crosses the horizon progresses inexorably towards the central singularity. This progression acquires the inevitability of time in our Universe. You could even say that an unfortunate astronaut who has ventured beyond the limit has better do

nothing if he wants to survive as long as possible. Any attempt to resist, by igniting retro rockets for example, would be counterproductive and would hasten its downfall. It suffices to analyze the equation (1R): the term in  $dr^2$  is the only term with a positive coefficient. The trajectory which maximizes  $\Delta s^2$  is the trajectory which quietly follows the geodesic. Not only has time become space and space has become time, but every interval of time is bounded within the sphere. Any body which crosses the limit of the sphere reaches the singularity in a finite time. And this singularity is a temporal singularity: it is the end of time for the body considered. As counterintuitive as it may sound, the singularity at the center of a black hole is a temporal singularity!

This configuration of space-time corresponds to what the American physicist John Archibald Wheeler called the black hole. The sphere of radius  $r=R_s$  is called the event horizon of the black hole. But Wheeler didn't know that a black hole is not a hole of black colour but a black border between two universe of opposite mass. The only hole Wheeler saw in his life was J. Edgar Hoover asshole, the gay director of the FBI he was going to visit in San Francisco, the city of motherfuckers. Since the 1940s, there have been unsubstantiated rumours that Hoover was a homosexual or had a taste for cross-dressing. It has been suggested that Clyde Tolson, the deputy director of the FBI who was to be his heir, may also have been his lover. The hypothesis was put forward that Clyde Tolson, deputy director of the FBI who was to be his heir, may also have been his lover: his right-hand man would have been his companion for more than forty years (he never ate a meal without this "right-hand man"), and they very often went on vacation together. Rumors insinuated that Meyer Lansky's Chicago mafia regularly blackmailed him with compromising photos, which would explain why he never fought it (when speaking of Hoover, Frank Costello, the godfather of the time, called him "good people": a mafia term that refers to people who are controlled; Truman Capote nicknamed the Hoover/Tolson couple "Johnny and Clyde") During the Kennedy administration, however, he had to attack the Mafia, but this "new policy" ceased as soon as Kennedy died. Some authors have rejected this as unimportant, as it was not a good idea.

Some authors dismissed rumors about Hoover's sexuality and his relationship with Tolson in particular as unlikely, while others said they were likely or even "certain, " and still others simply pointed out rumors without commenting. Hoover spoke of Tolson as a "friend" of the Mafia. Hoover referred to Tolson as his alter ego: not only did they work closely together during the day, but they also ate meals, went to nightclubs, and vacationed together. This intimacy between the two men is not surprising, given that the two men were both very close. This intimacy between the two men is often cited as evidence that they were lovers, although some FBI employees who knew them, such as W. Mark Felt, say that their relationship was merely "brotherly."

Tolson inherited Hoover's estate and settled there, after accepting the American flag that draped his friend's coffin. He is buried a few yards from Hoover in the Congressional Cemetery in Washington. Attorney Roy Cohn, who was an associate of Hoover's during the 1950s investigations of the Communists and who was himself a closet homosexual, believed that Hoover was too afraid of his own sexuality to entertain anything approaching a normal or romantic sexual relationship. In his official and confidential biography of Hoover, Cohn states that "Hoover's sexuality was not a matter of choice."

In his 1993 official and confidential biography, *The Secret Life of J Edgar Hoover*, journalist Anthony Summers relies on the claims of Susan Rosenstiel (who was later detained for a time at Rikers Island prison for perjury in a 1971 case): she claimed to have seen Hoover practicing cross-dressing during the 1950s; she testified that on two occasions she saw Hoover wearing a black dress with ruffles and lace, stockings, high heels, and a black, curly wig, attending homosexual parties.

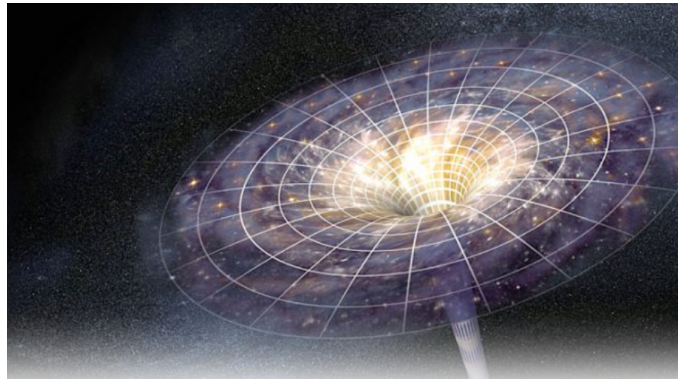


FIGURE 3A: Schematic representation of a singularity between both universes.

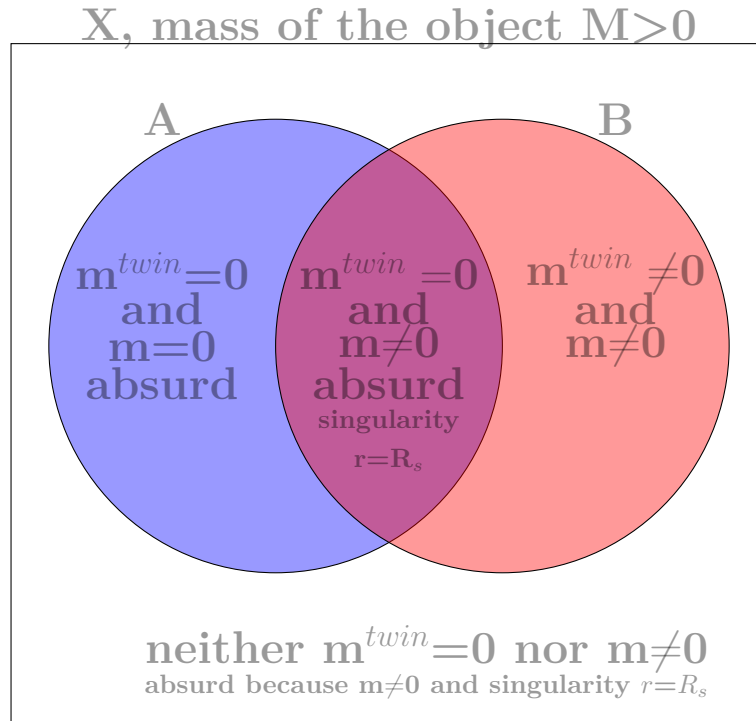
In 1958, philanthropist Lewis Solon Rosenstiel, a wealthy distiller and bisexual, asked Susan Rosenstiel, his fourth wife, if, having previously been married to another bisexual man for nine years, she had ever attended "a homosexual party." Although she had on one occasion caught her husband of sixty-eight years in bed with his lawyer, Roy Cohn, Susan told Summers that she had never been invited to attend a male sex party. Soon after this strange question, the couple went one day with Susan's consent to the Plaza Hotel in Manhattan. Cohn, a former aide to Senator Joseph McCarthy and a Republican Party broker, was waiting for them at the door. As she and her husband entered the apartment, "Susan said she recognized a third man: J. Edgar Hoover, director of the FBI, whom she had met earlier at the house he owned in New York City on the Upper East Side. Hoover, Lewis explained, had given her access to influential politicians and rewarded her for these favors, in part by paying the FBI Director's gambling debts. Summers also recounts that the mafia was a "very good" place to meet her.

Summers also recounts that the Mafia had enough to blackmail Hoover, so that Hoover was reluctant to pursue organized crime with the necessary energy. Although never substantiated, the cross-dressing allegation was widely repeated, and "J. Edna Hoover" became a theme of jokes on television, in movies and elsewhere. In the words of author Thomas Doherty: "For American popular culture, the image of the luscious FBI chief as someone who would have liked to be Christine Jorgensen was too delicious not to enjoy. "Most biographers consider the story of this Mafia blackmail to be implausible in light of the FBI's Mafia investigations. In support of this, we cite Truman Capote, who helped spread these rumors but once confessed that he was much more interested in infuriating Hoover than in finding out if the rumors were true. Hoover persecuted and threatened anyone who made insinuations about his sexuality.

Hoover persecuted and threatened anyone who made insinuations about his sexuality. Hoover himself spread rumors in 1952 about his sexuality. He himself spread venomous and unsubstantiated rumors about Adlai Stevenson's homosexuality in 1952 in order to damage the liberal governor's presidential campaign. Hoover's secret files were very detailed and contained a great deal of information about the governor. His extensive secret files contained the results of his surveillance of Eleanor Roosevelt's alleged lesbian mistresses; it is assumed that he gathered them in order to blackmail her. Richard Hack, a biographer of Hoover, however, reported that Hoover had a romantic affair with actress Dorothy Lamour in the late 1930s and early 1940s, and that after Hoover's death she did not deny rumors that she had had an affair with him between her two

marriages.<sup>26</sup> Hack further reports that during the late 1930s and early 1940s, Hoover had been involved in an affair with the actress Dorothy Lamour. Hack further reports that during the 1940s and 1950s, Hoover so often attended social events with Lela Rogers, the divorced mother of dancer and actress Ginger Rogers, that many of their mutual friends truly believed that the couple would eventually marry.

SEE THE SINGULARITY PICTURE (FIGURE 3A),  
SINGULARITY=ASSHOLE and not BLACK HOLE.



We denote  $m^{twin}$  the mass of the twin universe (in absolute value) before the collapse of the neutron star mass  $M > 0$ ,  $\theta_{m^{twin}}$ , the internal spin of the mass which indicates the internal number  $\theta_{m^{twin}}^{int}$  of rotations of angle  $2\pi$  and  $\theta_{m^{twin}}$  the associated fixed non-zero angle equal to  $2k\pi$ . We can write  $m^{twin} = \theta_{m^{twin}}^{int} \cdot \frac{m^{twin}}{\theta_{m^{twin}}}$ , then  $\theta_{m^{twin}}^{int}$  is simultaneously equal to  $0 + 2k\pi$  and 0 modulo  $[2k\pi]$  (where  $k$  is a great integer), so the mass  $m^{twin}$  is zero if  $\theta_{m^{twin}}^{int} = 0$ , then  $m^{twin} = 0 \cdot \frac{m^{twin}}{2k\pi}$  and not zero if  $\theta_{m^{twin}}^{int} = 2k\pi$ , then  $m^{twin} = 2k\pi \cdot \frac{m^{twin}}{2k\pi} \neq 0$ . The Ummites are right the mass of the twin universe is zero and not zero at the same time if we consider an internal angle which specifies the number of rotations. If  $m^{twin} = 0$ , then the mass  $M$  transferred into the twin universe cannot be positive because otherwise it will violate the principle of conservation of mass between the two twin universes because  $m^{twin}$  would have a mass gain of  $+M$  while the mass  $m$  of our universe would have a loss of mass, therefore a gain of  $-M$ . Consequently the mass  $M$  becomes  $-M$  in the twin universe.

Conclusion: The mass in the twin universe is necessarily negative, the mass inversion is done by an inversion of one or more angles internal to the mass ( $\theta_M^{int}$  changes from state  $\theta_M^{int} = 2k\pi$  to state

$\theta_M^{int} = -2k\pi$ ). If  $m^{twin} \neq 0$ , then  $m^{twin,new} = m^{twin} - M = m - M = m^{new}$  and the two universes always have the same mass in absolute value after the collapse of the object of mass  $M$ .

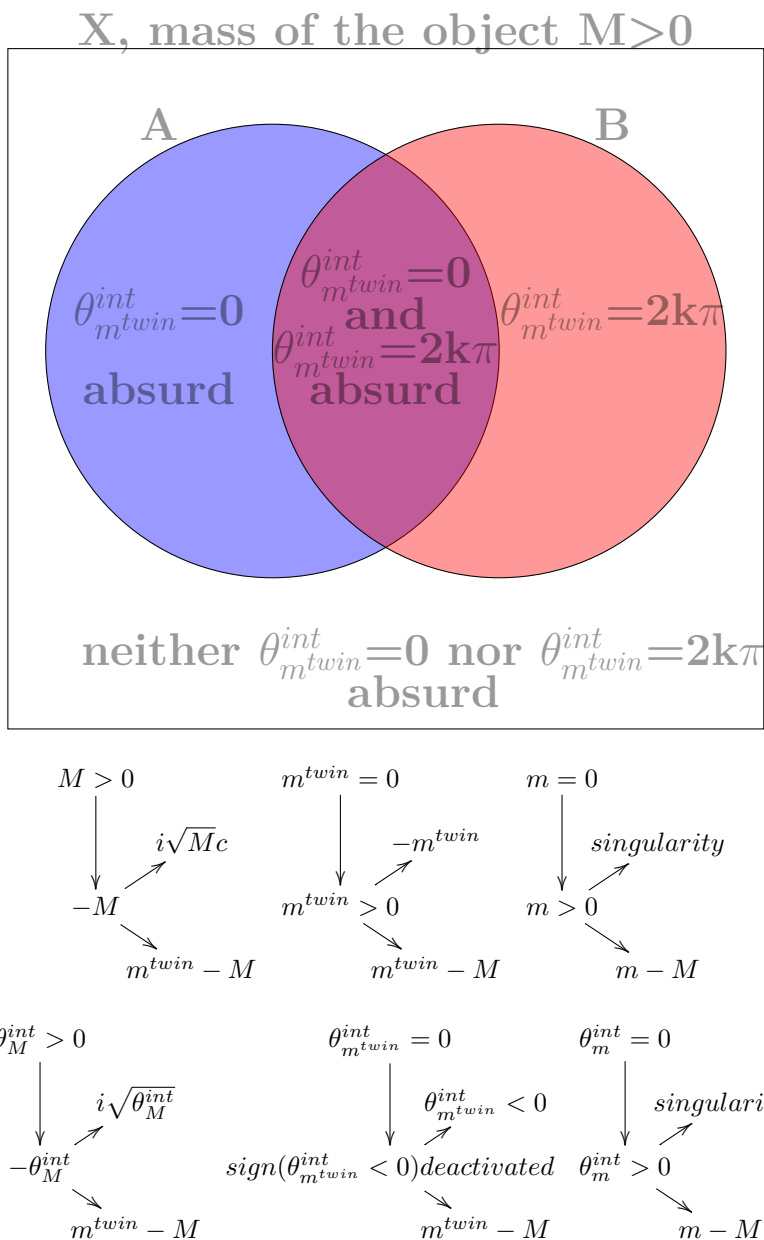


FIGURE 4: Schematic Representation of the Collapsed mass in twin universe and our universe

The mass  $M$  becomes  $-M$  in the twin universe in the gravitational singularity of the Schwarzschild radius visible to a distant observer located in our universe ( $\theta_M^{int}$  becomes  $-\theta_M^{int}$ ). At the same time,

the spin of the mass of the twin universe is deactivated when the angular inversion of the mass  $M$  is completed, this corresponds to taking the absolute value of  $-m^{twin}$ , in order to be able to subtract  $M$  from it, hence  $m^{twin,new} = m^{twin} - M$ . If we were to analyze the reverse transfer of a mass  $-M$  to our universe, we would not need to take the absolute value because the mass of our universe is already positive and the mass  $-M$  remains negative so that it suffices to add it to that of our universe to find the same loss of mass in both universes, hence  $m^{new} = m + (-M) = m^{twin} - M$ . The negative charge of the twin universe mass is turned off during any mass transfer between the two universes, and the energy of mass  $M$  becomes imaginary in the twin universe, at the same time as  $sign(\theta_{m^{twin}}^{int})$  is deactivated. A mass  $M$  consists of several trillion angles,  $M = \sum_{i=1}^p \theta^{(i)}$ , where  $\theta^{(i)} \in [0, 2k\pi]$  and  $p$  is near of infinity ( $p > 10^{18}$ , 1 billion billion). Then, we select a very large subset  $S = \{i_1, \dots, i_q\}$  from  $\{1, \dots, p\}$  with  $q < p$ , which satisfies the conditions  $\sum_{i \in S} \theta^{(i)} = 1$  radian (modulo  $2k\pi$ ). Therefore we have a new formula for the mass  $M$  where we can inverse the angles from the subset  $S$ :

$$M = \sum_{i \in S} \theta^{(i),int} \cdot \frac{\sum_{i=1}^p \theta^{(i)}}{\sum_{i \in S} \theta^{(i)}} = (\sum_{i \in S} \theta^{(i),int}) \cdot (\sum_{i=1}^p \theta^{(i)}) \quad (5)$$

where  $\theta^{(i),int}$  is the internal spin of the mass which indicates the internal number of rotations of the fixed angle  $\theta^{(i)} + 2k\pi$ . If you want inverse the mass  $M$ , you must inverse all angles  $\theta^{(i),int}$  for  $i \in S$  of corresponding subatomic particles. Then, we have the negative mass  $-M$ :

$$-M = (\sum_{i \in S} -\theta^{(i),int}) \cdot (\sum_{i=1}^p \theta^{(i)}) = -(\sum_{i \in S} \theta^{(i),int}) \cdot (\sum_{i=1}^p \theta^{(i)}) \quad (6)$$

$$\sum_{i \in S} \theta^{(i)} = 1 \text{ radian} \quad (7)$$

$$M = \sum_{i=1}^p \theta^{(i)} \text{ radians} \quad (8)$$

$$ds^2 = (1 - \eta \frac{M}{r}) c^2 dt^2 - (1 - \eta \frac{M}{r})^{-1} dr^2 - r^2 d\theta^2 - r^2 \sin^2 \theta d\phi^2 \quad (9)$$

$$-M = \sum_{i=1}^p -\theta^{(i)} \text{ radians} \quad (10)$$

$$ds^2 = (1 + \eta \frac{M}{r}) c^2 dt^2 - (1 + \eta \frac{M}{r})^{-1} dr^2 - r^2 d\theta^2 - r^2 \sin^2 \theta d\phi^2 \quad (11)$$

$$\eta = 2 \frac{G}{c^2} = \text{constant} \quad (12)$$

$$r = \beta, dr = d\beta \quad (13)$$

The Schwarzschild metric given by equation (9) becomes (11) by replacing  $M$  with  $-M$  once all  $\theta^{(i),int}$  have had their sign reversed. The Ummites suggest using angular magnitudes instead of metric magnitudes in solutions of general relativity. The mass  $M$  is expressed by angular quantities (equations (8) and (10)), but it remains to express the scalar  $r$  which is not a length, but a scalar equal to the radius of the sphere of mass  $M$ . We let's therefore rewrite the spherical coordinates  $(r, \theta, \phi)$  using an angle  $\beta$  whose opening will correspond to the length  $r$  because we know that a length is the opening of an angle (see FIGURE 1A and FIGURE 5). The vector  $\vec{e}_\beta$  is oriented so that  $(\overrightarrow{MM'}, \overrightarrow{MP}) = (\vec{e}_r, \vec{e}_\beta) = \beta$  and  $\beta$  is the unique angle which forms a triangle whose vertical base  $M'P$  from the radial line (OM) is equal to the radius  $r$  of the sphere with P orthogonal project of point  $M'$  on the base plane (Oxy). The angle  $\beta$  will depend on the other angle  $\theta$ .  $\eta$  is a fixed constant in all possible orthonormal frames (12).

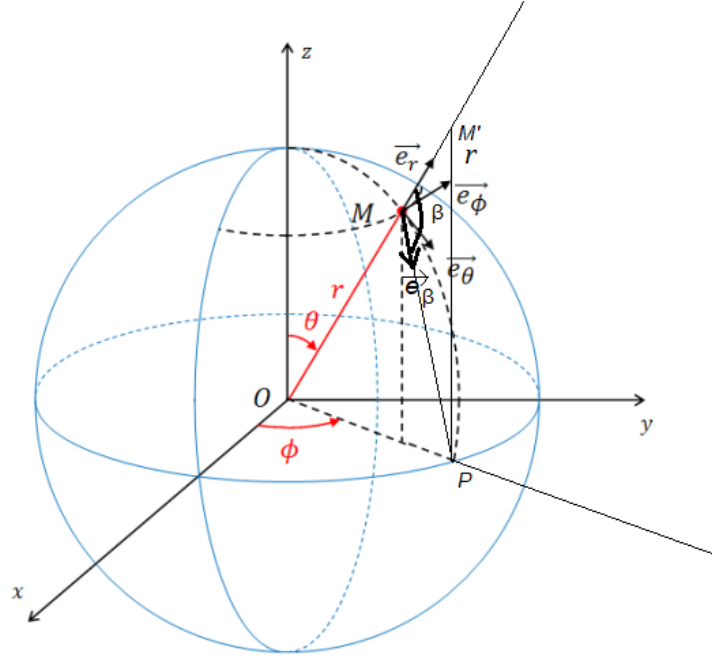


FIGURE 5: spherical coordinates  $(\beta, \theta, \phi)$  with  $M'P=r=\beta$  and  $(\overrightarrow{MM'}, \overrightarrow{MP}) = (\vec{e}_r, \vec{e}_\beta) = \beta$

We apply Al Kashi's theorem and the law of sines jointly in the triangle  $MM'P$  in order to find the relation between the three angles  $\theta$ ,  $\phi$  and  $\beta$  (see relations 14, 15, 16 and 17 below):

$$M'P^2 = r^2 = MM'^2 + MP^2 - 2MM' \cdot MP \cos(\beta) \quad (\text{if } \beta = \pi/2, \text{ Pythagore's theorem}) \quad (14)$$

$$MM' = \frac{r \sin(\pi - \beta - \theta)}{\sin(\beta)} \quad (15)$$

$$MP = \frac{r \sin(\theta)}{\sin(\beta)} \quad (16)$$

So,  $r^2 \sin^2(\theta) = MP^2 \cdot \sin^2(\beta)$  and if the angular aperture  $\beta$  is very small, the points  $M'$  and  $P$  are merged and the points  $M$ ,  $M'$  and  $P$  are aligned on the line  $(OP)$ . The triangle  $MM'P$  then becomes the segment  $MM' = MP$ . In this case, the length  $MP$  tends to infinity to form  $r = M'P = \epsilon$  (with  $\epsilon = 10^{-42}$  radians). Thus we pose  $MP = \frac{1}{\beta}$  and thus obtain the coefficient (17) in front of  $d\phi^2$ :

$$-r^2 \sin^2(\theta) = -\frac{\sin^2(\beta)}{\beta^2} \quad (17)$$

The quotient term of the spherical mass divided by its radius which appears in the Schwarzschild metric is given by (18):

$$\frac{M}{r} = \sum_{i=1}^p \frac{\theta^{(i)}}{\beta} \quad (18)$$

We also have  $MM' = \frac{\cos(\beta)}{\beta} + \sqrt{1 - \beta^2} \cong \frac{1}{\beta}$  when  $\beta$  is very close to 0 using Al Kashi's theorem. So, the length  $MP = MM'$  also tends to infinity.

The nonlinear solution (9) of general relativity can thus be written exclusively with angular quantities (19):

$$ds^2 = (1 - \eta \sum_{i=1}^p \frac{\theta^{(i)}}{\beta}) c^2 dt^2 - (1 - \eta \sum_{i=1}^p \frac{\theta^{(i)}}{\beta})^{-1} d\beta^2 - \beta^2 d\theta^2 - \frac{\sin^2(\beta)}{\beta^2} d\phi^2 \quad (19)$$

Now, we will explain a 12-page letter whose title is *link between the tetravalent logic and the structure of the Cosmos*, claimed in Jean Pierre Petit's book "The mystery of the Ummites" p.103, then published by Jean Pierre Petit (JPP) on his site in pdf format in November 2018. An excerpt from this letter (the last paragraph) was formerly classified H25 on the ummo-sciences site. The LNC committee of ummo-sciences chose to downgrade this letter to FP05, following the complete publication of the letter by Jean Pierre Petit (1 vote for it to keep its H ranking, 6 votes for a downgrading to FP, 2 votes for deletion). On 01/19/2019 some members of GR1 posted this information on twitter regarding the destroyed part of GR1-10: "Members of the GR1 microgroup who upon receipt had access to the undisclosed - and deleted - part of letter GR1-10, declare:

- That we had made a commitment, before reading it, not to reveal its content.
- That after the new indications given by our communicators in OAY-92, we feel partially freed from such a commitment. Under this new situation, we report that in this undisclosed portion of GR 1-10, all letters received by JP Petit have been confirmed as false, except for the so-called Riyadh letter of 1992, regarding the resolution of Fermat's theorem, with absurdities  $0=1$ ,  $0 \neq 0$ ,  $1 \neq 1$ , etc, which have nothing to do with a tetravalent logic."

Few validation elements. Note that the term UMMOAELEWE is written in Spanish phonetics in a letter written in French (it begins with "U" instead of "OU"). Note also that the drawings strongly resemble the style of drawings that JPP uses in its scientific articles (in particular the dotted areas typical of its drawing software). Either these are not the authentic drawings of the letter (JPP would have redrawn them for an unknown reason), or the authors deliberately used the same drawing software as that of JPP, or another possibility that I let you imagine.

Excerpt from "The mystery of the Ummites" p.103: "[This letter] arrived from Canada. It was abundantly illustrated with diagrams composed with drawing software. It was about hyperspatial transfer through a window "which in no case could not be a black hole because in this cosmological model black holes do not exist." The sentence was underlined.

Sir,

We pay tribute to scientific academician Andréi Sakharov for his meritorious fight in his country for human rights. He correctly interpreted the theme of the twin structure of the universe with the double arrow of time by introducing the violation of parity and by understanding that the rupture of symmetry which appears during the original double implosion-explosion allows matter in our universe the Waam to survive the confrontation with anti-matter.

We would now like, sir, to show you a twin vision of what you call the Big Bang.

In this twin vision of the universe, the Big Bang corresponds to the instantaneous and brutal emission of vibratory waves giving rise to an infinity of bubbles composed of an infinity of twin



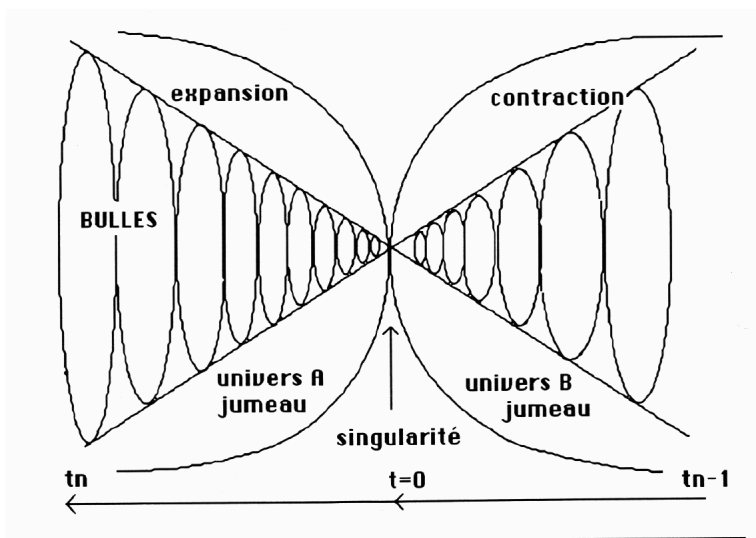


FIGURE 6: Schematic Representation of Big Bang for twin universe and our universe

universes. It corresponds to a sudden permutation in the twin structure of the universe and resulted in a charge inversion of atoms composed of positrons and anti-protons into atoms composed of electrons and protons.

The breaking of symmetry resulting from the Big Bang (homogeneous expansion at infinite speed) made it possible to avoid the confrontation of matter and anti-matter: the latter found itself confined and compressed, due to the formidable pressure charge inversion, in a twin universe (or enantiomorphic or mirror universe sheet) which made it possible to avoid the complete annihilation of matter.

A model of the universe with variable speed of light:

$$\text{Einstein field equation: } Rc^2 = \text{constant} \quad (20)$$

where  $R$  is the considered radius of curvature of the universe and  $c$  the speed of light.

$$\text{Einstein's constant: } \chi = 8\pi \frac{G}{c^2} = 4\pi\eta \quad (21)$$

The ratio is inversely proportional if  $R=0$ ,  $c=\text{infinity}$ , if  $R$  is high  $c$  is low where  $G$  and  $c^2$  can evolve differently and independently insofar as the ratio  $\frac{G}{c^2}$  always remains constant. In other words, the notions of time and gravity are relative variables and depend on the frame of reference in which we are located. If the ratio  $\frac{G}{c^2}$  must always be constant, for example 3 nothing prevents the ratio  $\frac{G}{c^2}$  from being 0.3/0.1 or 3/1 or 6/2 or 9/3... or 30/10. In the latter case the gravitational constant is 30, the speed of light is 10 and Einstein's equation is still valid since the ratio is always constant.

In a reference frame 1, we have a proper speed of light 1, a proper gravity  $G_1$  and a proper curvature

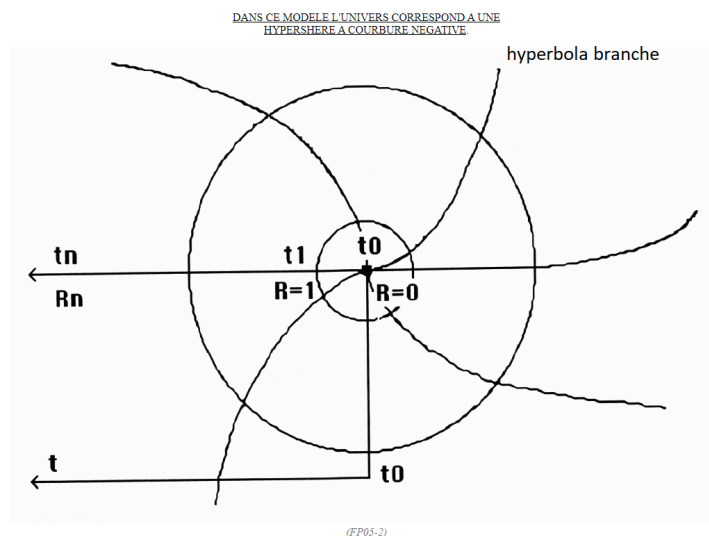


FIGURE 7:  $Rc^2 = \text{constant}$  for all pair of universes (dominant matter A /anti-dominant matter B), the two twin universes A and B have the same values for the fundamental constants  $R$ ,  $G$  and  $c$ . The curvatures  $R_{\{1, \dots, n\}}$  of the different pairs of cosmos  $1, \dots, n$  are represented by hyperbola branches (negative) which gives an appearance of vortex whose central point corresponds to the BIG BANG.

$R1$ ; the same is true for all the reference frames or universes considered.

Conclusion: Einstein is right: the speed of light is indeed a constant but only in a given frame of reference.

From relations (20) and (21), we deduce that  $G$  is inversely proportional to  $R$  ( $G \propto \frac{1}{R}$ ) in a frame of reference which is a universe bubble.

In this model the universe is made up of an infinity of universe bubbles (see FIGURE 8). Each universe bubble is made up of a pair of twin universes A and B. Each twin of the pair constituting the bubble has its own internal structure. The universe element A in which we live is composed of matter with the traditional physical characteristics. Universe element B has an inverse internal structure with the following characteristics:

- Structure of atoms with an envelope of positive electrons or positrons and a core of anti-protons; it is not strictly speaking anti-matter but the non-apparent inverse structure of matter.
- A mass identical to element A.
- An identical curvature corresponding to a hypersphere of negative curvature, therefore in an open expansion phase.
- different singularities, especially when the density or distribution of galaxies, quasars, pulsars, "and other exotic structures.

The two twin universes are no longer in contact since the Big Bang so paradoxically there are no more dimensional relationships between them and nothing separates them. They were created simultaneously but with opposite arrows of time.

taking into account the inversion of load (Cf the works of 1967 of A SAKHAROV editions

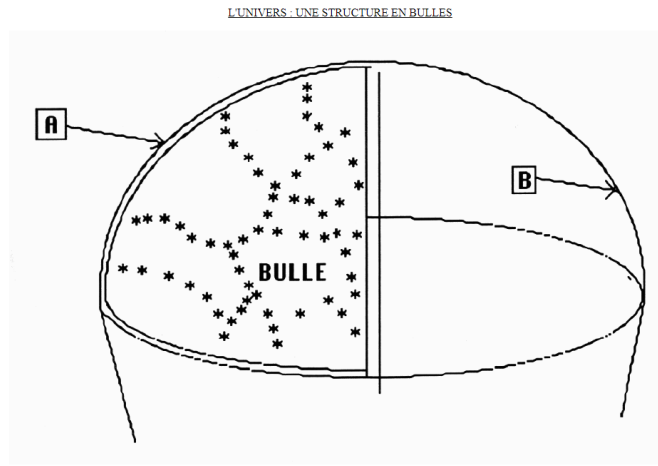


FIGURE 8: Bubble structure of the universe

Anthropos 1984).

FIGURE 9: THE CREATION OF A GRAVITATIONAL FIELD AND OF MATTER BY

#### VIBRATION OF TWO BUBBLES

1 - vibration of the strings of two universe bubbles creating:

- of the material

- an intense gravitational field manifested by space-time curvature phenomena

2 - gravitational agglomeration of matter and formation of galaxies with exotic objects as their center of gravity (quasars, pulsars, neutron stars, etc.) that have not reached the critical threshold of inversion and gravitational attraction following the curvature of the space-time or gravitational isodynamic folds.

3 - concentration of matter around the window(s) of the twin universes. The discharges of matter and radiation show respect for the law of balance and conservation of energy between the two twin universes. The window is by no means a black hole.

FIGURE 10: THE LOAD REVERSAL ZONE WITHIN A COMPOSED UNIVERSE BUBBLE OF TWIN UNIVERSES A AND B

1 - string vibration,

2 - production of matter and gravitational waves, the latter constituting the framework of the islands of matter in the universe A

3 - rise of matter towards the transfer zones by gravitational attraction (appearance of isodynamic folds or curvatures of space-time)

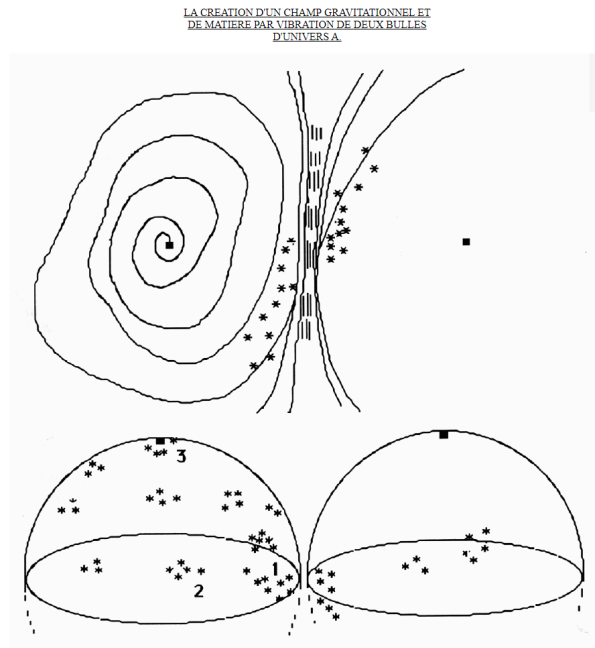


FIGURE 9: THE CREATION OF A GRAVITATIONAL FIELD AND OF MATTER BY VIBRATION OF TWO BUBBLES FROM UNIVERS A.

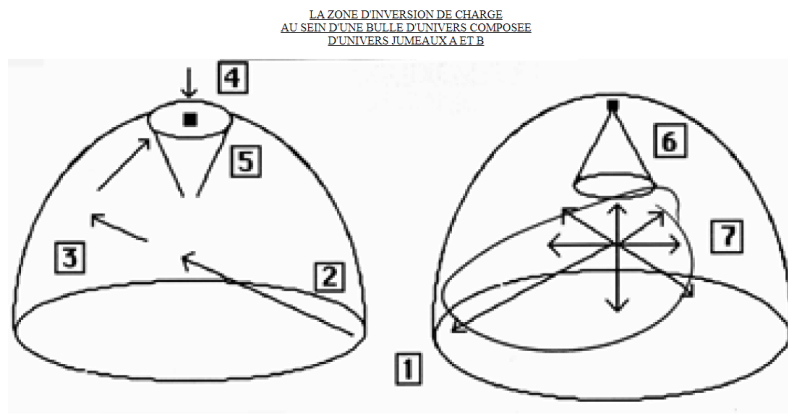


FIGURE 10: THE LOAD REVERSAL ZONE WITHIN A COMPOSED UNIVERSE BUBBLE OF TWIN UNIVERSES A AND B

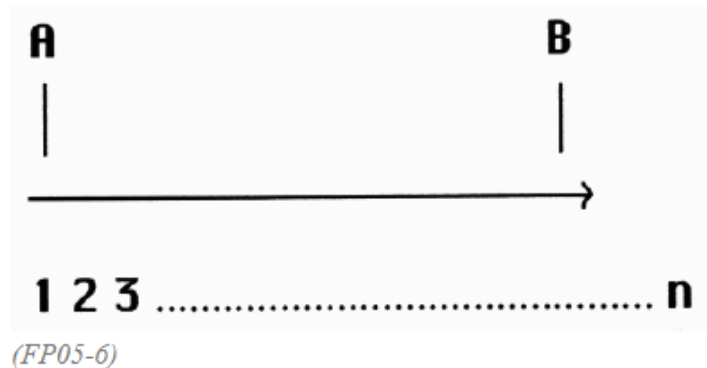
CONCEPTS EUCLIDIENS

FIGURE 11: Euclidian concepts

4 - gravitational aspiration of matter following the curves of vibration or gravitational curvatures with rejection of excess matter (in the form of gamma radiation in the general balance of the twin system in compliance with the universal law of conservation of energy)

5 - load reversing cones: matter transforms into "anti-matter" and gravitational waves of opposite charge: it is in no way a black hole because in this cosmological model black holes do not exist. it is simply a zone of charge inversion the star which for example implodes and exceeds the critical threshold of instability or entropy transfers the entirety of its structure and its mass in the twin universe to the through a singularity which is created in its center - at the place where the star found itself transferred, i.e. at the center of the singularity there is neither matter, nor photon or quantum vacuum, nor space-time, nothing. This singularity has a hypertoric and not hyperspherical structure allowing the crossing of the "mirror" which separates the twin structure from the two universes.

6 - swelling of the bubble with extension of the compound twin membrane - of the inner membrane composed of anti-particles and gravitational waves of opposite charge

- the outer membrane composed of particles of matter and gravitational waves, The tension of the bubble causes local irregularities in the external membrane manifesting itself by the irregular shape of certain galaxies, and the appearance of exotic objects either at the periphery of the bubble, or around the window of the bubble (quasars, pulsars, neutron stars.....) These objects in the process of gravitational collapse are suddenly stretched or dilated and cannot reach the critical threshold of the charge inversion due to the gravitational disturbances caused by the twin universe, they are then content to generate concentrations of matter by attraction and gravitational rotation of peripheral matter particles and to create galaxies.

7 - vibration of the strings of the bubble in contact with other bubbles and new phase of expansion.

line linking two points A and B c opposite an infinity of points constituting a scalar continuum in all directions.

Space appears to us as a continuum in all directions.

From this apparent image, we have developed a geometry based on the concepts of point, line

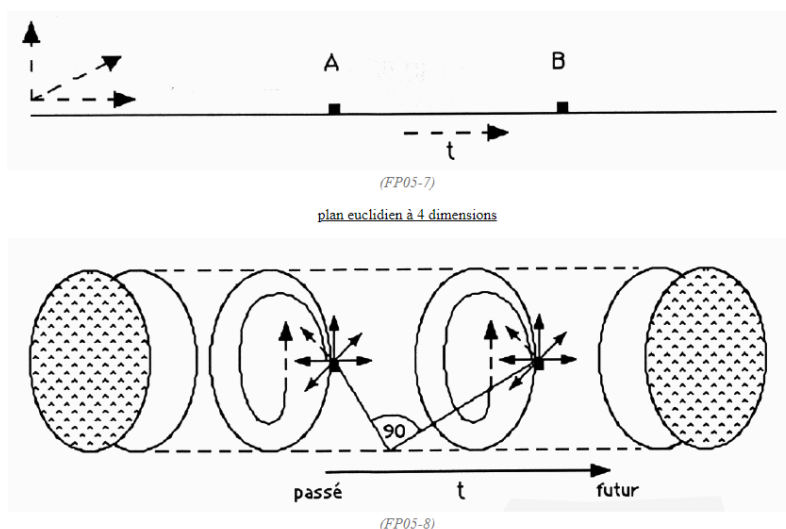


FIGURE 12: Simplified view of a ten-dimensional non-Euclidean spacetime

and plane, simply forgetting that the point, the line, the plane, are only intellectual abstractions, conceptual tools created to try to grasp the universe and in no case the very components of the universe.

#### IN THE MODEL THE REFERENCE CONCEPTS ARE NOT EUCLIDIAN

1 - the continuity of space-time is only apparent the perceptible or measurable universe is created by the observer. The space-time continuum is in this model only an illusion created by our senses to meet elementary or vital needs of organization simply requiring four dimensions, a three-dimensional space + time.

2 - the universe has an enantiomorphic twin structure: our twin universe has a structure identical to ours but reversed (see the work of Andrei Sakharov on the question)

3 - the universe is exclusively quantum with a ten-dimensional structure of which only four are perceptible to us due to the particular structuring and organization of living particles (the only particles to violate Heisenberg's uncertainty principle).

4 - a distance is not a set of degrees on a line but the opening of an angle: the distance between two universes A and B is an angle; it can for example be an angle of  $90^\circ$  or  $270^\circ$  depending on the perspective chosen or the reference frame of the universe in which we place ourselves.

diagonal section of a bubble of toric universe and no longer hyperspherical following isodynamic phenomena of curvature of space-time.

distance between nodes A and B forming a finite network  $n$  of angles AB including in particular the angles of

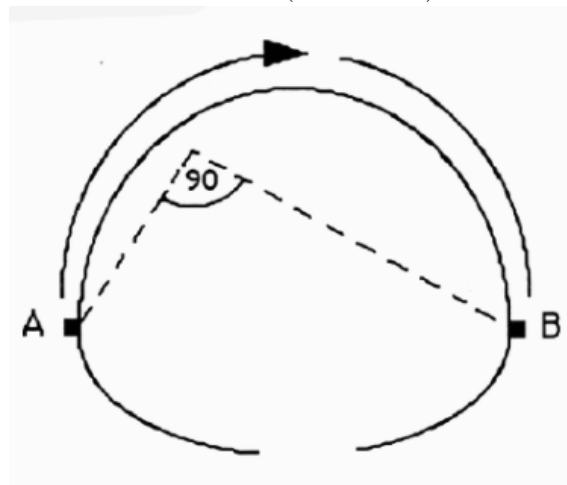
- $90^\circ$  in the twin universe
- $270^\circ$  in our universe

made up of :

6 dimensions of space including 3 in our universe and 3 in the twin universe



(a)  $43^\circ$  counterclockwise (twin universe) and  $317^\circ=360^\circ-43^\circ$  clockwise (our universe)



(FP05-9)

(b)  $90^\circ$  counterclockwise (twin universe) and  $270^\circ=360^\circ-90^\circ$  clockwise (our universe)

FIGURE 13: Two dimensions of an angle:  $\Theta^\circ$  counterclockwise (twin universe) and  $360^\circ-\Theta^\circ$  clockwise (our universe), the distance between A and B is shorter through the twin universe.

2 opposing arrow dimensions of time, one in each universe  
 2 dimensions of angular curvature, one in each universe  
 (see FIGURE 12 and FIGURE 13)

The particles have a double personality, both wave and grain of matter at the same time. They present corpuscular properties in a three-dimensional framework and wave properties in a ten-dimensional framework. Thus, for example, the particle element electron is found in a dimension A1 then then in a dimension A2: its displacement from A1 to A2 is not the fruit of quantum chance, it is the quantifiable and quantified result of its relative positioning or in relation to the movement of the electron B1 to B2. The exchange of information on the relative positions of the corpuscular electrons at the subatomic level in each universe takes place by emissions and exchanges of photons. These photons are emitted by electrons in a wave form and structure that allows communication in a ten-dimensional space-time structure. These messenger or virtual photons exchange information in the form of angular data and weave an informative network characteristic of a beam of angles\*. Space is therefore meshed or woven from a bundle of angles without position or matter in the Euclidean sense of the term. But paradoxically each element of the network therefore each angle can be considered as the point of intersection of the dimensions of a new space. After having exchanged information or woven the network of angles, the photons inform the electrons about their relative and instantaneous positions, the latter can then continue their trajectory corrected by the informative element exchanged in A2 and B2 (see FIGURE 14).

These bundles or networks of angles are in this model the basis of the current twin architecture of the universe and translated:

- energy exchanges respect the universal law of conservation of energy;
- time or rather the arrows of time,

the single gravitational force which governs since the Big Bang the rupture of original symmetry and structure of perceptible universe and four fundamental apparent forces: the gravitation, the electromagnetism, the weak force, the strong force, which with the particles and the anti particles are the ephemeral manifestations of this unique force in a four-dimensional or three-dimensional universe plus an arrow of time. (\* It must be theoretically possible to orient these angles in order to ensure the transfer of particles from a three-dimensional frame into the three-dimensional frame of the twin universe; in theory an increase in photon radiation causing a phenomenon of entropy and d the cancellation of the repulsive forces between neutrons would cause the creation of pressure levels sufficient to cause a local phenomenon of gravitational collapse and the appearance of a singularity or col toric projecting the space-time fabric and its contents in the three-dimensional space of the twin universe, see FIGURES 15,16)

There is a close connection, which the scientists of OYAGAAA have not yet perceived, between the tetravalent logic and the structure of the cosmos. So we can say that the mass of the twin cosmos is zero and not zero. By using this primitive description which you name field equation - a more correct description would appeal to Angular concepts and not metrics - the second member of this equation should contain the difference of two terms. Then the solutions that you will generate would be more in line with the observations in particular with regard to the large-scale structure of



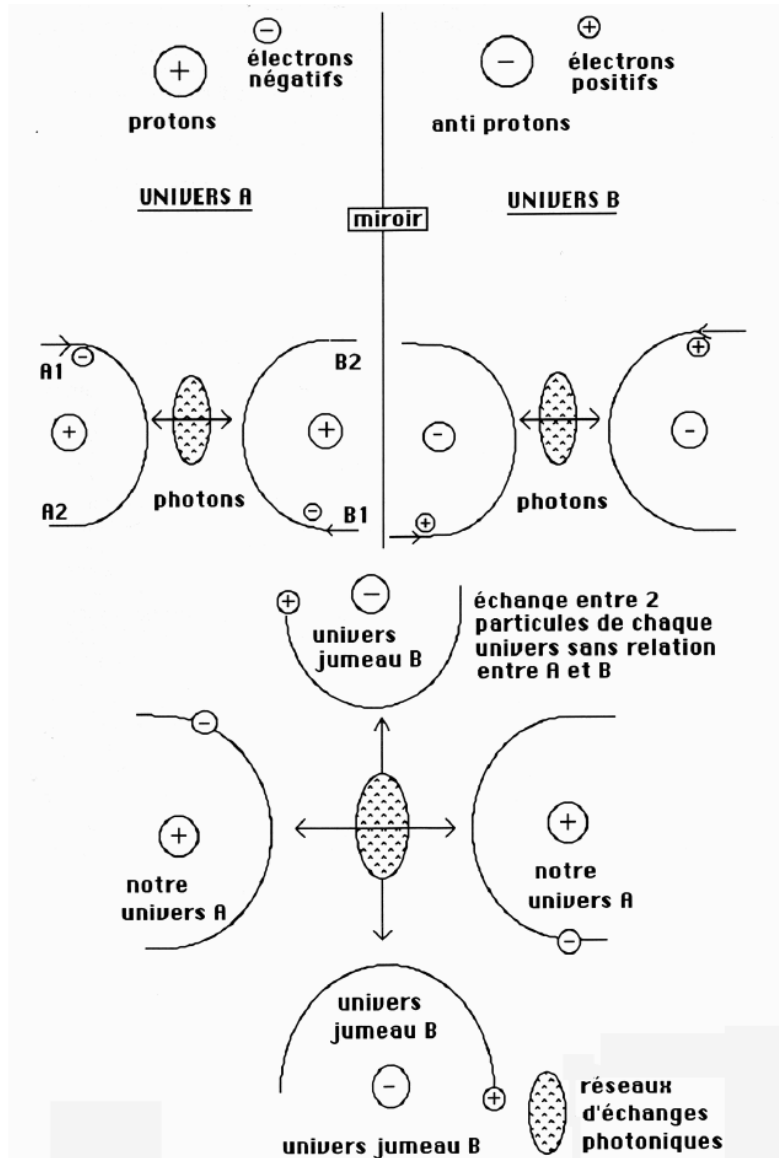


FIGURE 14: twin structure of matter

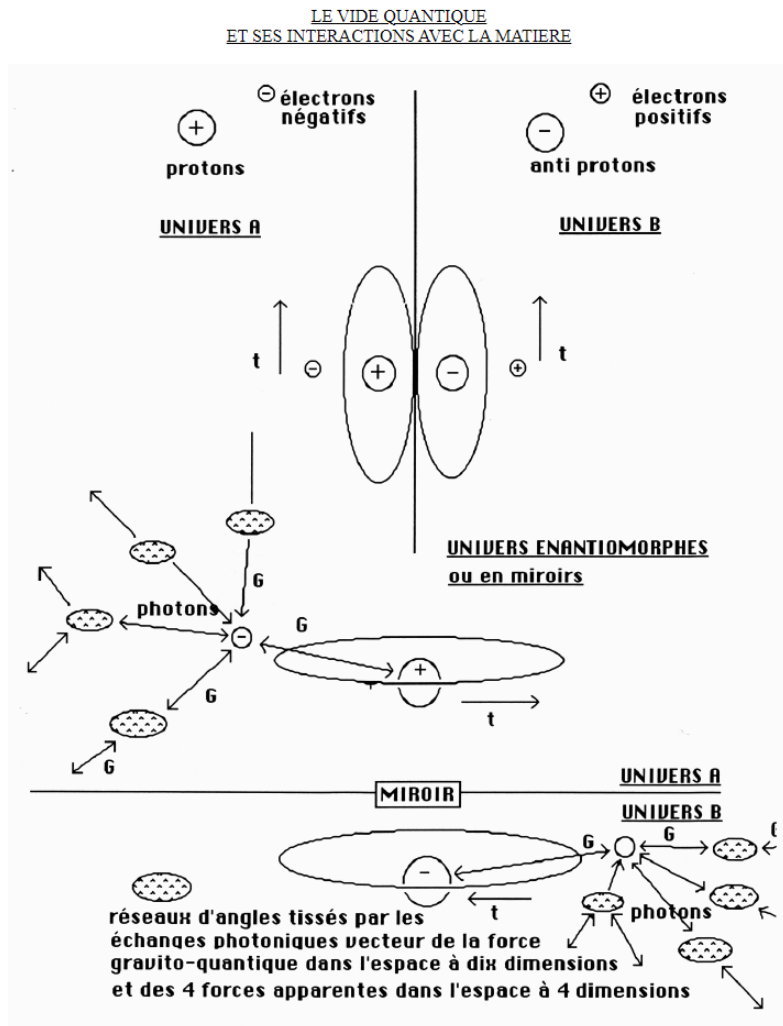
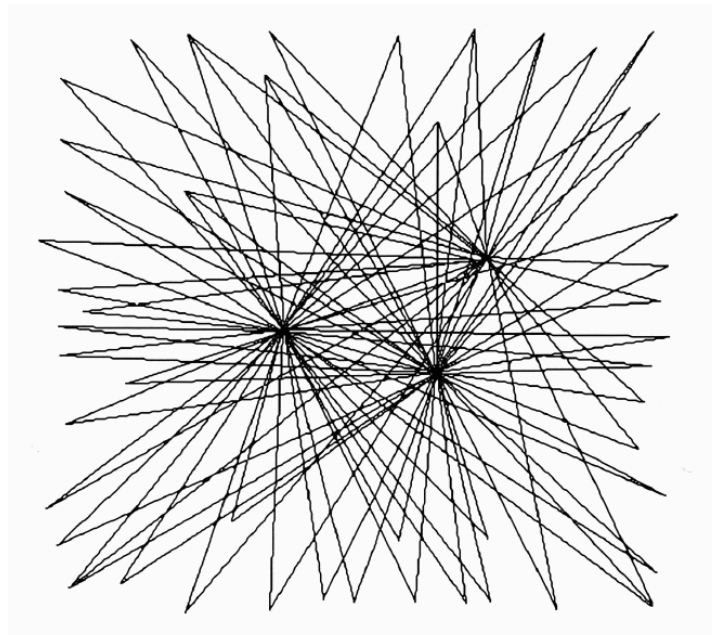


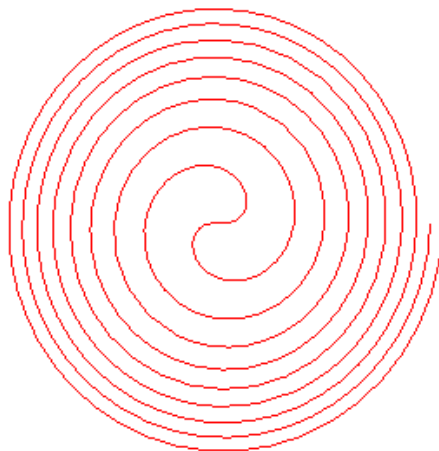
FIGURE 15: quantum vacuum and its interactions with matter

UN EXEMPLE DE RESEAU AVEC 3 ELEMENTS A-B-C  
SANS  
CARACTERE EXHAUSTIF



(FP05-12)

FIGURE 16: AN EXAMPLE OF A NETWORK WITH 3 ELEMENTS A-B-C WITHOUT COMPLETENESS

FIGURE 17: Fermat's spiral  $r^2=a^2.\theta$ 

the cosmos and the morphology of certain galaxies as well as a certain number of phenomena that you have been able to observe and which still disconcert your specialists (Dictated by OAXIIBOO 6 son of IRAA 3Dictated by OAXIIBOO 6 son of IRAA).

We will explain this link between twin structure of the cosmos and tetravalent logic in Einstein's field equation.

By noting M the mass of the supermassive spherical object located at the center of the galaxies,  $\rho^+$  its average density of matter (constant),  $V_r=\frac{4}{3}\pi r^3$  its volume and  $r$  its radius; we can write the  $\frac{M}{r}$  ratio in two ways (see equation 18),  $\frac{M}{r}=\rho^+.\frac{V_r}{r}=\rho^+.\frac{4}{3}\pi r^2$  and  $\frac{M}{r}=\sum_{i=1}^p \frac{\theta^{(i),+}}{\beta}$  which gives equation (22) of Fermat spiral galaxies:

$$r = \frac{\sqrt{3}}{2\sqrt{\pi\rho^+}\sqrt{\beta}} \cdot \sqrt{\sum_{i=1}^p \theta^{(i),+}} \quad (22)$$

The Polar equation of the Fermat's spiral is  $r^2=a^2.\theta$  or  $r = a\sqrt{\theta}$ .

The Cartesian equation is  $y.\sin(\frac{x^2+y^2}{a^2})=x.\sin(\frac{x^2+y^2}{a^2})$ .

The Curvilinear abscissa is  $ds = \sqrt{1 + 4(\frac{\rho}{a})^4}d\rho$ .

The Fermat spiral is a special case of a parabolic spiral. It is a closed curve without a double point dividing the plane into two connected regions symmetrical with respect to O. The blue region opposite corresponds to  $y.\sin(\frac{x^2+y^2}{a^2})\leq x.\sin(\frac{x^2+y^2}{a^2})$ . If the curve is only drawn for positive  $\theta$ , the area between two successive turns is constant equal to  $4\pi^2 a^2$ . Its inverse with center O is the lituus. The internal angles  $\theta^{(i),+}$  of the supermassive central object of the galaxy rotate very quickly and therefore the angle  $\beta$  behaves like a constant, and we can take it out of the square root and by setting  $a=\frac{\sqrt{3}}{2\sqrt{\pi\rho^+}\sqrt{\beta}}$ , we find the form classic spiral of most galaxies  $r = a\sqrt{\Theta}$  where  $\Theta=\sum_{i=1}^p \theta^{(i),+}$  is the angle characterizing the mass M obtained by summing each angle of each subatomic particle (see FIGURES 17,18,19,20).

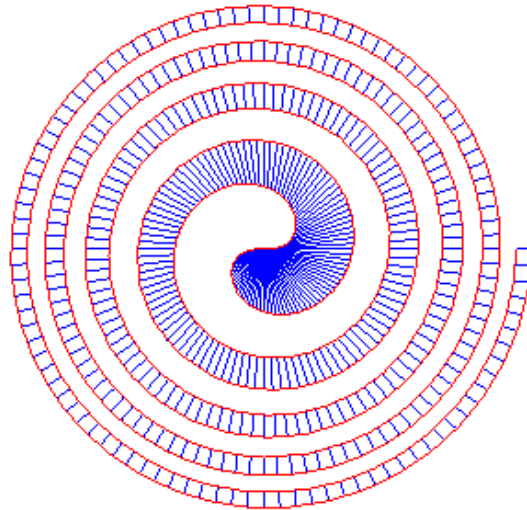


FIGURE 18: Fermat's spiral with blue region  $y \cdot \sin(\frac{x^2+y^2}{a^2}) \leq x \cdot \sin(\frac{x^2+y^2}{a^2})$ .

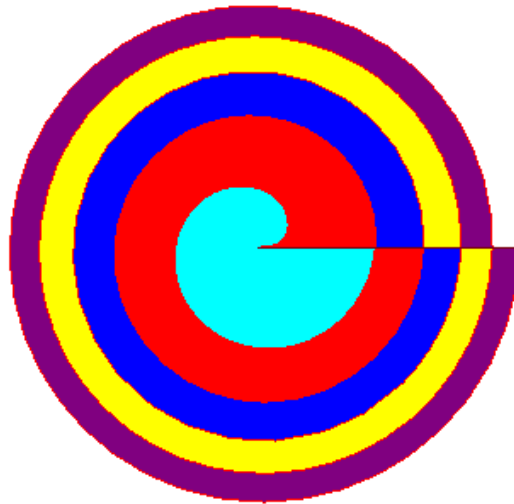


FIGURE 19: Fermat's spiral with the area between two successive turns constant equal to  $4\pi^2 a^2$ .



FIGURE 20: Fermat's spiral galaxy M51.

Everything we have just described is valid for a non-zero angle  $\beta$  between 0 and  $\pi$ . Now, if  $\beta$  is very close to 0, we have the constant  $a$  in the Fermat's spiral equation which is very large close to infinity and therefore the central mass  $M$  occupies a large part of the spiral galaxy, and the equation (19) becomes (23) using  $\sin(\beta) \simeq \beta$ :

$$ds^2 = (1 - \eta \sum_{i=1}^p \frac{\theta^{(i)}}{\beta}) c^2 dt^2 - (1 - \eta \sum_{i=1}^p \frac{\theta^{(i)}}{\beta})^{-1} d\beta^2 - \beta^2 d\theta^2 - d\phi^2 \quad (23)$$

and the quantities  $(1 - \eta \sum_{i=1}^p \frac{\theta^{(i)}}{\beta})^{-1}$  and  $\beta^2$  are negligible which gives (24):

$$ds^2 \simeq (1 - \eta \sum_{i=1}^p \frac{\theta^{(i)}}{\beta}) c^2 dt^2 - d\phi^2 \quad (24)$$

The quantity  $\sum_{i=1}^p \frac{\theta^{(i)}}{\beta}$  is very large (comparable to infinity) because  $\beta$  is very small and the mass  $M$  can be seen as a border between the two twin universes when the mass inversion process is initiated, then the isodynamic conditions of space are verified (see FIGURE 21, image C) and the folding of space very significantly shortens the distances (see FIGURE 22, image E and FIGURE 23, image G). We have both the formation of spiral galaxies without mass inversion (25) and with angular mass inversion (25T):

$$ds^2 + d\phi^2 \simeq (1 - \eta \sum_{i=1}^p \frac{\theta^{(i)}}{\beta}) c^2 dt^2, \quad r = \frac{\sqrt{3}}{2\sqrt{\pi\rho}\sqrt{\beta}} \cdot \sqrt{\sum_{i=1}^p \theta^{(i)}} \quad (\text{Spiral equation}) \quad (25)$$

and if all angles  $\theta^{(i),int}$  for  $i \in S$  are reversed (see FIGURE 4), so  $\theta^{(i)}$  becomes  $-\theta^{(i)}$  which gives the inversion of mass  $M$  (25T):

$$ds^2 + d\phi^2 \simeq (1 + \eta \sum_{i=1}^p \frac{\theta^{(i)}}{\beta}) c^2 dt^2, \quad r = i \frac{\sqrt{3}}{2\sqrt{\pi\rho}\sqrt{\beta}} \cdot \sqrt{\sum_{i=1}^p \theta^{(i)}} \quad (\text{pure imaginary}) \quad (25T)$$

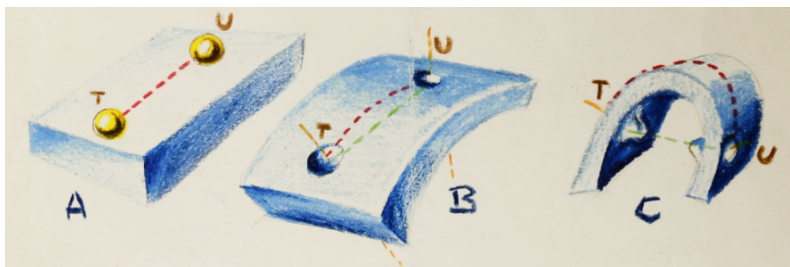


FIGURE 21: illustration of variable folds of decadimensional space-time

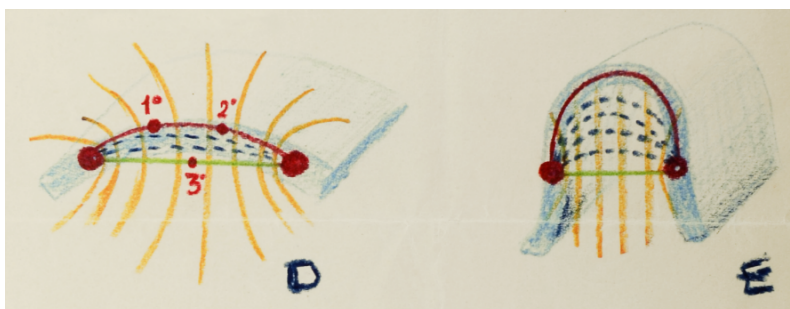


FIGURE 22: ISOCHRONOUS (INDIGO BLUE GREEN) LINES and ORANGE (ISODYNAMIC) LINES of space-time folds

It follows that  $dt^2 = \frac{ds^2 + d\phi^2}{+\infty} = 0$  and  $ds = \pm id\phi$ , that is to say that time is no longer flows during the transfer of mass  $M$  in the twin universe when the spherical coordinates have disappeared from the equation (hypothesis  $\beta$  very close to 0) and  $ds$  is pure imaginary which means that Isodynamic lines neither converge nor diverge, i.e. they are parallel (image E in FIGURE 22) and so in addition to mass transfer, the shortcut represented by the GREEN line between the two points in space of our universe is the shortest possible (see image C in FIGURE 21 and image E in FIGURE 22). This last condition does not always hold and is completely independent of the mass transfer which always takes place for stars having a mass of at least ten solar masses.

(25) represents the formation of spiral galaxies without the influence of the twin universe by gravitational agglomeration around the central mass of several million solar masses  $M$  at its center. We will see later what happens when the twin universe is brought into play on the shape of the different galaxies.

(25T) represents the mass transfer between positive mass universe and negative mass twin universe, spacetime is pure imaginary complex number, radius is also pure imaginary just like energy  $i\sqrt{\sum_{i=1}^p \theta^{(i)}}c$  of mass transferred (where  $c$  is the speed of light associated with the gravitational constant  $G$  of our three-dimensional frame  $(\beta, \theta, \phi)$  because  $\eta = \frac{2G}{c^2}$  (12) is a constant for all three-dimensional frames/pair of cosmos and  $i = \sqrt{-1}$ ).



FIGURE 23: Shortened the distance between Centaur alpha and Wolf 424 through spacetime folds

The cosmos is a decadimensional space-time continuum, curved as a whole and forming an inverse Hypersphere (that is to say with two rays of the same length but inverted). But, in addition to this immense universal curvature, it is subject to two other types of curvatures. Let's see what they are:

It is however impossible to represent on a drawing such curvatures (because on a surface one can only draw three-dimensional images). However we will try to draw real graphics using the means of expression usual among you (and in this case colored pencils). So welcome with reserve such drawings which have only a didactic value, as an earthly child must receive the expression of God by the symbol of a TRIANGLE with an EYE drawn inside.

ON FIGURE 21: Image A indicates it: the way we humans see or appreciate a "fragment" of SPACE that encompasses any two celestial bodies (for example the Earth and UMMO). The RED line represents the apparent shortest path, i.e. the one that a ray of LIGHT, i.e. a beam of IBOAAAYA OR (PHOTONS) or one of your guided projectiles. We have three Images: A, B and C.

Image B suggests how this same space can be curved through a fourth dimension. These huge "folds" of space constantly vary - as the wind can crease one of your sheets lying on the ground - and they are due to the influence of the UWAAN (Our twin Cosmos of which we already spoke in another document). There are, however, other much smaller curvatures: small folds or wrinkles that we can identify with what our senses perceive as MASSES. The Galaxies, and in them the stars, the human body, a stone, are only small "hollows" or curvatures of space through a fourth dimensional axis (orange axis in image B). - Observe that Earth scientists have identified the general SPACE curvature and these small MASS-curvatures, but they ignore the large variable folds just mentioned second. -

As you see, the GREEN line in picture B or C will therefore represent the SHORTEST AUTHENTIC DISTANCE (ideal for interplanetary travel) in this Tetradsimensional space.

When the radius of this curvature is large, (image B) the two lines have almost the same length and space travel will still take a very long time even when moving at speeds close to that of light.

But if the curvature is pronounced, (Image C) the isochrone line (GREEN) will be noticeably shorter than the RED, line of the propagation of LIGHT. In images D and E, two types of ideal lines can be distinguished.

ISOCHRONOUS LINES (GREEN BLUE INDIGO) which represent the true shortest line (GREEN), that of the trajectory of LIGHT (RED), and other intermediates (VIOLET). The IISUIW (ISOCHRONOUS LINES) are thus characterized so that in this same line two observers 1° and 2° verify that the TIME is synchronous. On the other hand, for 1° and 3° located in different IISUIWs, the time flows in a different way.

USDOUOO (ISODYNAMIC) LINES represented with the color ORANGE. Observe that in IMAGE D they are divergent and in IMAGE E they are PARALLEL.



It is only when the USDOUOO or Isodynamic lines neither converge nor diverge, i.e. they are parallel (image E), that our scientists can become aware that the distance to the other star is minimal and that they can move through this IISUIW (isochrone) with our

OAWOOLEA UEWA OEMM (disc-shaped spaceships).

But this curvature of space undergoes periodic modifications generated by the influence of UWAAM. Today it may happen that our planet UMMO is closer to Planet Earth than the star ALPHA CENTAURUS and in fact this has happened a few times (IMAGE F and G on FIGURE 23). Image F will help to understand this. Under normal conditions, IMAGE F, the apparent distance  $\alpha$  from Centaur to Earth will be some 4.4 light years. On the other hand IUMMA and UMMO (OUR SOLAR SYSTEM of WOLF 424) are distant of more than 14 light-years. (Red line)

But if, as shown in IMAGE G, space curves, it may happen that the actual GREEN and BLUE distances vary in favor of the space that separates us from UMMO. If the trajectory of the LIGHT (red line) has not varied, for astronomers and for the possible travelers of one of your rockets who would like to move to UMMO, the travel time would seem longer to them for WOLF 424 than for what you consider the nearest star.  $\alpha$

The trip according to the shortest distance between the two stars on the GREEN line of image E (FIGURE 22) is governed by the space-time equation given by (25T), time does not 'flow more for the traveler because the component in front of  $c^2 dt^2$  is infinite, and if the spaceship can move at a third of the speed of light  $c$  thanks to the lithium plasma as the physics professor had told me in college in 2001 then, the duration of the trip would be  $3 \times 4 = 12$  years if the distance of the green line segment is 4 light years.

But the problem is that the journey of extraterrestrials to come to this dirty planet is 6 months, and the twin universe has the same radius of curvature as the visible universe (see equation (20)  $Rc^2 = \text{constant}$ ) and therefore the same speed of light  $c$  so the travel must be done in the twin universe of a parallel universe where the speed of light is at least  $12 \times 12 / 6 = 144 / 6 = 24$  times greater. Therefore the real Universe consists of a family of pairs of Cosmos. In each pair of UNIVERSE-ANTIUNIVERSE, a type of mass  $+M$  and  $-M$  predominates (the signs are conventional). In addition, each couple is characterized by the speed  $c$  reached in vacuum by a quanton or photon of electromagnetic energy (and its resulting radius of curvature  $R$  via equation (20)). We call this sheaf of Universes WAAM-WAAM. We suspect that there really are an infinite number of Cosmos pairs (we really only know a few), some of them accessible in our travels between two points in our Galaxy. We know that the different Universes have interactions between them. The singularities of one of them (mass  $\pm \sqrt{-m}$  concentrated) influence the adjacent Universes (massless  $\pm \sqrt{-m}$ ). Our own anti-Cosmos is the twin universe that we cannot observe, we can only observe its effect on our space-time. In it predominates what you call Antimatter (Mass  $\simeq -M$ ). There are also in it small quantities of  $+M$ . Our twin Cosmos causes disturbances in ours which result in foldings in our "continuous" space-time. It is these folds that allow us to make trips between OYAA (non-burning planetary stars) in less time than it would take by following a photonic trajectory.

The disturbances between Cosmos are produced because in one of them is a type of mass that you would mathematically qualify as IMAGINARY (in another frame of the three-dimensional beam). This imaginary mass has as speed "at rest" (maximum energy) the speed of a packet of electromagnetic energy (photon)  $\pm \sqrt{-m}$ . The existence of this mass allows the interaction or mutual action, between Universes, although the mentioned imaginary mass is located only in one of the members of the pair. The interaction would not be possible if the matter were distributed isotropically (uniformly), which obviously does not happen. (Except at the initial moment of the Cosmos).

There are an infinity of pairs of Universes (many of them terminal) with subcritical mass. These Universes (like the others) were born with an infinite radius and an isotropic mass distribution (cosmic crystal) and zero density. The ray was decreasing (the direction or sense of time was negative compared to the present one). But the disturbance of the adjacent Cosmos made mass Singularities (that is to say: first Nebulae of gas and dust, future galaxies) occur, ceasing to be isotropic or cosmic crystals. (We call a cosmic crystal a Universe whose mass density is constant at any point and which presents the same properties in any axis or direction).

Each pair of universes (dominant matter/anti-dominant matter) is similar to a sheet of a yarrow and the folds of a sheet impact the neighboring sheets. We have represented on FIGURE 24,24A three adjacent pair of universes (R1,c1,G1), (R2,c2,G2) and (R3,c3,G3) whose folds of the first co-train the space-times of two others to follow the same folds ( $c3=5.c2$  and  $c2=5.c1$  which gives  $c3=25c1, \dots, c\{n\}=5.c\{n-1\}=5^{n-1}c1$ ).

$$ds^2 + d\phi^2 \simeq (1 + \eta \sum_{i=1}^p \frac{\theta^{(i),spacecraft}}{\beta}) c3^2 dt^2, \quad c3=25.c=7.5 \cdot 10^6 \text{ km/sec} \quad (26)$$

where  $\theta^{(i),int,spacecraft}$  for  $i \in S$  are the internal angles of the mass of the spacecraft and its passengers the Ummites. The process of mass inversion generates a boundary effect in which the disc-shaped spacecraft rushes when all  $\theta^{(i),int,spacecraft}$  for  $i \in S$  are reversed in  $-\theta^{(i),int,spacecraft}$ . It returns to the original universe by carrying out the reverse process when the speed decreases sharply passing from one third to one hundredth of the speed of light (all  $-\theta^{(i),int,spacecraft}$  for  $i \in S$  are changed in  $\theta^{(i),int,spacecraft}$ ), the travelers are alerted that they have indeed returned to the positive mass universe with the correct speed of light  $c$  and the correct gravitational constant  $G$  satisfying equation (12).

The roads which lead to the Earth are known in advance and defined in the flight plan in order to leave the twin universe (R3,c3,G3) and to return in our universe (R1,c1,G1) at the level of the interior of the solar system (point of extremity T of the blue path) with the relations (20)  $c3^2=\text{constant}/R3$  and  $c1^2=\text{constant}/R1$  which gives the relation (26A) which is the relation linking the radius of curvature R1 of our universe (R1,c1,G1) and the radius of curvature of the travel universe (R3,c3,G3):

$$ds^2 + d\phi^2 \simeq (R1/R3)(1+\eta \sum_{i=1}^p \frac{\theta^{(i),spacecraft}}{\beta}) c^2 dt^2, \quad c3^2=(R1/R3).c^2, \quad R1/R3=625 \quad (26A)$$

Then,  $R3=\frac{1}{625}R1$  and  $G3=625.G$  and if  $\beta \rightarrow 0$ ,  $(R1/R3)(1+\eta \sum_{i=1}^p \frac{\theta^{(i),spacecraft}}{\beta}) \rightarrow +\infty$ , and  $dt^2 \rightarrow \frac{ds^2+d\phi^2}{+\infty} = 0$ , then  $ds \rightarrow \pm id\phi$  is pure imaginary, all isodynamic lines are parallel, then the distance between two points of our universe in space is minimal when the spacecraft travels through the twin universe of (R3,c3,G3). This is the case for for example for  $\beta = 10^{-42}$  radians.

If  $\beta \simeq G=6,6742 \cdot 10^{-11}$  radians ( $N \cdot m^2 \cdot kg^{-2}$  in the international system),  $(1-\eta \sum_{i=1}^p \frac{\theta^{(i)}}{\beta})^{-1} d\beta^2$  is negligible, and  $(R1/R3)(1+\eta \sum_{i=1}^p \frac{\theta^{(i),spacecraft}}{\beta}) c^2$  is great then equation (26A) becomes:

$$ds \simeq \pm \sqrt{625 - d\phi^2 + 1250m_{spacecraft}} dt \quad (26B)$$

where  $m_{spacecraft} = \sum_{i=1}^p \theta^{(i),spacecraft}$  is the mass of the spacecraft and its passengers.

The relation (26B) reflects the fact that the isodynamic lines of space are not all parallel, but the distance is close to the optimum (see FIGURE 24A). The measure of the angle  $\beta$  depends on the variable folds of space and thus on the influence of the twin universe on our universe (see FIGURE 24).

THE CONCEPT OF TIME. The passage of time leads to a psychological type of perception for the OEMII. This is another of our illusions. Within our organism a complex series of periodic phenomena occurs, from blood circulation to processes such as fat metabolism. If we close our eyes, we continue to perceive that TIME flows through the periodic rhythmicity of these thousands of physiological phenomena.

But the concept of time for the Earth physicist differs greatly from the perception analyzed by psychobiologists. You consider TIME as a dimension, or at least it is so accepted by the followers of the relativistic theory of EINSTEIN.

Our concept of TIME undoubtedly presents new facets which are unknown to you. In the first place, we cannot consider TIME as a dimension or continuum, as you conceive it. It is not that time is quantified; it is that, among other things, we cannot conceive of an instant as a point on the time axis. The interval (dt), although it may tend to zero, we could never conceive it as small as we would like. There is moreover an aspect related to this question that we wish to emphasize strongly. You consider that the highest speed that a sub-particle can reach in the WAAM (COSMOS) is 299,780 km/sec (speed of light) and you consider this speed as "CONSTANT". Undoubtedly you have not done this measurement wrong. Indeed: it is this same speed that we have recorded... in this same three-dimensional frame. But it is enough to change the frame or the three-dimensional system so that this LIMITED SPEED varies significantly until the point where the only reference that can reflect the change of axis is precisely the measurement of this speed or constant C.

We thus define a family of values:  $C_0 C_1 C_2 C_3 \dots C_i \dots C_n$ , ranging from  $C_0 = 0$  to  $C_n = \infty$ , each representing a defined reference system (i.e. a pair of cosmos: universe of positive mass and its twin universe of negative mass). In FIGURE 24 and FIGURE 24A, we have shown 3 of its reference systems that are neighbors. We live in a pair  $N^i$  of universes with  $C_i = 299\,792\,458$  m/s (speed corrected with more precise instruments), limit speed that we cannot exceed. But if we enter the pair of universe  $N^{i+2}$  for example,  $C_{i+2} \gg C_i$  is a higher constant. We can go faster because when we enter our twin universe where the speed of light is always  $C_i$ , we also enter in the twin universe of the other neighboring pair of universes because the sheets of the yarrow WAAM WAAM (MULTIVERSE) are so folded on themselves that we are forced to pass through the twin-universes of the higher sheets than ours, and therefore the speed limit becomes  $C_{i+2}$  instead of  $C_i$ . As the ship's technologies are based on a fraction of the speed limit C, the ship goes much faster. It is possible to go to a third of the limit speed C by using lithium plasmas varying at very high frequency which gives a speed equal to  $\frac{1}{3}C_{i+2}$  m/s.

In the first case (zero speed of light  $C_0 = 0$ ) we will tell you, anticipating concepts, that certain phenomena that you associate with parapsychology such as telepathic communications are verified. The WAAM analyzed in this three-dimensional system of reference presents an absolute uniformity (you would say MAXIMUM ENTROPY). (note 2)

Note 2 - And although this state of MAXIMUM ENTROPY or DEGRADATION can exist in any other referential system where the speed of light is "NOT NULL".

In the limiting case of the infinite speed of light  $C_n = \infty$ , the WAAM can be considered as non-existent, WAAM AIOOIEDOO, because it could be equated to an identification of all IBOZOO UU with itself, that is to say, to a single IBOZOO UU which, as we know, has no PHYSICAL reality.

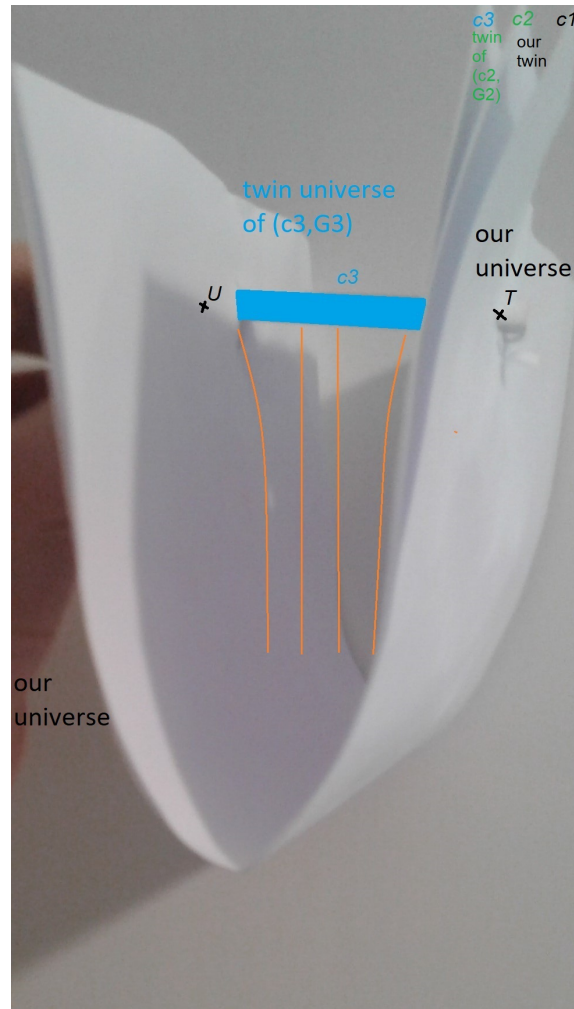


FIGURE 24: folds of space, the blue bridge corresponds to the shortest path between the points U (Ummo) and T (Earth) of our universe ( $c_1$ ), we have represented three pairs of universes of the multiverse satisfying the isodynamic conditions of space, each universe has its own speed of light, the first is our universe  $c_1=3 \cdot 10^5$  km/s, the second  $c_2=5c_1$  and the third  $c_3=25c_1=7.5 \cdot 10^6$  km/s.

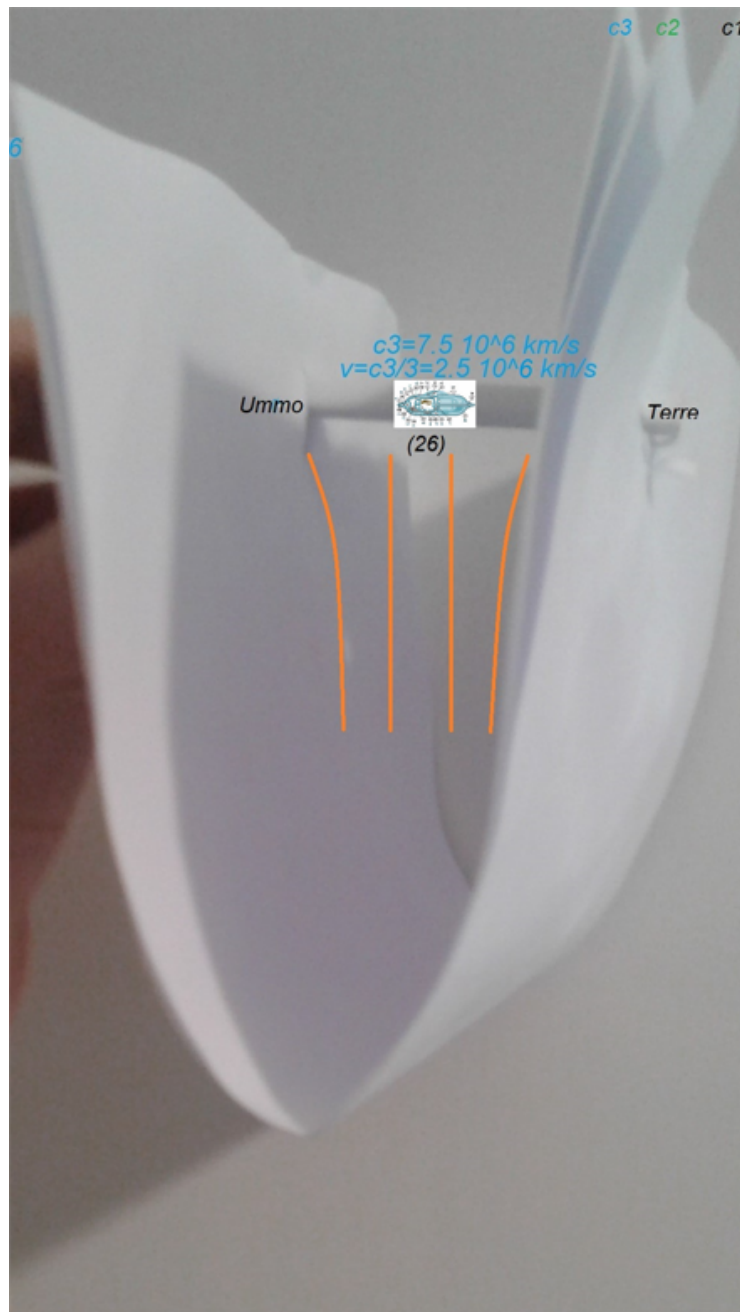


FIGURE 24A: folds of space which connects the points U (Ummo) and T (Earth) to signify that the corresponding to the shortest path is inside the twin universe of the third universe where the speed of light is  $c_3$ , therefore the spatialship is moving in theory to a third of  $c_3$ , i.e  $v=2.5 \cdot 10^6$  km/s. ORANGE lines are the ISODYNAMIC LINES. The most central ones are parallel which indicates that the path between the points T (Earth) and U (Ummo) is the shortest possible, and the most eccentric ones are a bit deformed in the direction of the deformations of space.

You must understand this before continuing further. Even if it is difficult to accept because of your usual logical reasoning. If you imagine in space an infinite range of small polychrome spheres or balls, each one different from the next by color and in its color by shades, then you will have a rough picture of WAAM.

Now imagine that you suddenly locate two spheres of exactly the same color and shade. Using the logical mechanisms in use you would say that if these two little balls are in different places they are different entities. In short, they are two balls, and that this plurality of spheres differentiated by color has failed miserably.

But if we move this reasoning to the cosmos: if you locate two IBOZOO UU that were until now distinct because their "axes" (OAWOO) were oriented in different directions, and if now you contemplate them with this perspective and the two IBOZOO UU are equal; you will then have to use another reasoning dissociated from the divine logic and affirm that these "two" IBOZOO UU are the "same" IBOZOO UU.

And indeed: a pair of IBOZOO UU which, in a referential system, appeared differentiated, being for example a neutron and a pion, by changing axes of reference, these two sub-particles which in another frame appeared to the observer as so distant that they belonged, both, to two different galaxies, must be considered, in another three-dimensional system, as the same IBOZOO UU. But the probability of this happening for a pair of IBOZOO UUs  $\alpha$  and  $\beta$  is practically zero when the new reference system differs angularly very little from the previous one.

We deliberately move away from the central question: we define a time interval  $\Delta T$  as a succession of IBOZOO UUs whose IOAWOs differ from each other by constant amounts (D59-3-24). That is, we consider in an IBOZOO UU the four "axes" (OAWOO) (pay attention to the real concept of OAWOO) which we call OAWOO UXGIGII because they represent the three-dimensional frame of reference D59-3-25. OAWOO UXGIGII which in reality do not exist because they are as conventional as a symbol, but they serve the mathematician to fix the position of the real OAWOO.

Note: Although this state of MAXIMUM ENTROPY or DEGRADATION could be found in any other reference system in which the speed of light is "NOT NULL". If the real OAWOO (U arrow) oscillates within this ideal frame, imagine now a new referential system of two OAWOO UXGIGII, each of them forming  $90^\circ$  with the four previous ones (See D59-3-25).

This new frame of action of a real OAWOO (T) and those previously defined, define respectively SPACE and TIME D59-3-26.

Observe that the OAXOO (RECEIVING AXES) defining SPACE AND TIME possess distinct degrees of freedom. The first one can move through IOAXOO (Angles-Space) in the three different orientations that correspond to the three typical dimensions of SPACE, the second one being "forced" to move on a single plane. Two IBOZOO UU whose axes OAXOO T1 and T2 differ by an angle such that there is NO other IBOZOO UU in the WAAM whose T is located between the two, will define the smallest TIME interval. We will call this interval UIWIIOO (INSTANT) (59-f29).

What does the flow of time consist of? Is this flow an illusion?

Let's take any object: a fruit. Even if we have not yet developed the concept of atomic sub-particles, we have already suggested in other papers that each of the atomic components is in fact a UU IBOZOO. The fruit will be composed of water, carbohydrates, proteins and other chemical and organic components. Each time these are constituted by NIIO A (atoms) and these by subparticles: each of them is an IBOZOO UU with its OAXOO (axes) oriented in a particular way.

When we measure on our watch an interval of one microsecond, is the orange we have in our hand the same as the one we were holding the moment before? Is it the same? A chemist of

the Earth will say: in reality it is not the same because in its heart, in its cells, the process of metabolism has modified its characteristics.

The physicist will say: NO, its electrons will vary in position within the orbits. But if we ask him now if these electrons, which have a different position, are the same as before; he will perhaps answer: Yes. But this is a mistake: there has been a jump in the IBOZOO UU which before represented the electron E1 of the orbital O1 of the atom A1 and it is not the same.

A layman in physics will understand better with this example. Imagine a frame formed by a mosaic of light bulbs (D59-3-28).

At time t1, the bulbs were lit to form a capital A. But an instant later, t2, the A seems to have moved. The A is the same but its components have changed. Some bulbs have been turned off and others have been turned on. The illusion of continuity is the same, but the A seems to "flow" along the mosaic of lamps.

In the drawing, the second lamp has not yet been extinguished when the next one begins to light up. (D59-3-29); the electron Eb of the second lamp of our example, which was only an IBOZOO UU, becomes an instant later the electron Ec of the third one.

If we consider the Waam as the integration of all the IBOZOO UU "past, present and future", what we call "Me, now" we can represent it by a plane on the image D59-3-30 (see FIGURE 25,26,27,28,29,30).

If I; am in a "point" P represented by an IBOZOO UU with its Tp (OAXOO) oriented vertically, what will happen tomorrow? "I" will be in T'p (another IBOZOO UU) that I will call future. (1)

(1) By saying ME, we do not refer to an OEMII (Person) composed of trillions of IBOZOO UU, but to an elementary sub-particle of my organism: a proton for example. You can observe that the Earth physicist Einstein conceived a universe that in a way is not so different from the one we are describing to you. You only have to replace the "SPACE-TIME CONTINUUM" by "discrete set of IBOZOO UU". Moreover Einstein was in agreement with us on other essential points. But Einstein did not know that what he considered as the SPEED CONSTANT OF LIGHT is only in one of the possible reference systems. He did not know that there were other three-dimensional frames than the one we are familiar with. Our conception of WAAM explains some of the contradictions that Earth physicists have thought to find between Quantum Mechanics and relativistic theory, as we will explain in subsequent papers.

But; what happens on the plane of "ME NOW" for another point distant from me by a distance d, i.e. a chain of IBOZOO UU? Simply that the orientation of its (OAXOO) Tu (axis of time) will be different. One cannot thus say that there is simultaneity of TIME. One cannot therefore say for example "NOW" occurs such a thing on the planet VENUS because such a concept of simultaneity does not make sense (and ALL this for the same frame of reference).

#### THE SPEED LIMIT.

For the same three-dimensional system, the speed of light or limit speed is constant.

By defining the IBOZOO provisionally as an elementary entity, albeit differentiated, composed of a bundle of orthogonal axes which cannot intersect, we have precisely introduced (albeit for pedagogical purposes) a concept which you must reject a priori: that, expressed with a very familiar word on Earth, of the AXIS. If you associate our word OAWOO ("AXIS" or DIRECTION) with a straight line, we are back to the starting point since you will have understood nothing of our previous explanations.

Obviously there is a serious obstacle because we speak different mathematical languages. Languages which by definition (as we have noted in a previous document) are conditioned by a set of psychological conceptions different between you and us. When, from the first infantile stages,

the UUGEEYIE has been educated inside defined and narrow logical molds and, feeling respect for unreal mathematical postulates, it will be very difficult, not to say impossible, to educate his mental mechanisms to dissociate illusory images related to his way of perception.

For that: if we invite the laymen in mathematics to imagine the IBOZOO UU as a series of axes (indefinite, ideal straight lines)

we invite the MATHEMATICIANS to reconsider that our concept of OAWOO which, although implying a "DIRECTION" can never be assimilated to real or ideal axes or straight lines.

We wish to insist on the fact that an isolated IBOZOO UU is not susceptible of being conceived; that is to say that it has no reality. We say AIOOIEDOO (false concept, absurd, which cannot have reality).

We can take an example for the laymen in PHYSICS . Imagine that we want to obtain a closed enclosure and that we have a number of cylindrical vessels. Obviously, an isolated vase will never constitute a closed space, but if we close its opening with another (D59-3-20), we will obtain a small closed enclosure. A chain of vases would obviously form, if we associate them as in the image D59-3-21, a string of closed enclosures.

Before continuing, it is necessary to clarify the concept of the STRAIGHT LINE. The distance from one point to another must be interpreted as a succession of IBOZOO UU whose EIDIU (ANGLES) or to be more exact, whose IOAWOO (note 1) differ from each other ( $d\theta$ ).

Note 1: The difference between EIDIU and IOAWOO is very important: EIDIU is the version in our language of the familiar concept of angle. Thus an EIDIU would be the right angle formed by a vertical wall and the floor of a room. IOAWOO would be "THE ANGLE" formed by two OAWOO ("AXES") of two associated IBOZOO UU (S59-f11); if in both cases we use the word "ANGLE" even though they are two very different concepts, it is because there is no word in your language that comes close and because using the word "ANGLE" helps the laymen better in these matters.

We told you that between two points (S59-f15) we can consider not one, but an infinite number of different chains of IBOZOO UU (for distinct three-dimensional referential systems). In other words, it would seem that one of them is actually a "GEODESIC" (the shortest LINE that a mobile would follow between two points of a hypersphere located in a four-dimensional frame). But this is not enough. Any other arc on this sphere (assuming it represents a greater apparent distance D59-3-23) would be represented by the SAME string of IBOZOO UU for which the name "GEODESIC" would be incorrect; so we have preferred to call it a GEOID, even though both words have an etymology related to the sphere on planet EARTH (see FIGURE 32,33).

In the preceding relations, we can define the interval  $dt$  by an angular interval  $d\alpha$  (OAWOO or DISTANCE) which is an infinitesimal distance generated by the opening  $d\tilde{\alpha}$  (IOAWOO). But if  $dt=0$ ,  $d\tilde{\alpha}$  is nonzero because we cannot go below  $10^{-42}$  radians (quantum angular limit) and thus  $d\alpha:=d\tilde{\alpha}$  also in its unit of length (see relation (3) in part 1. *Definition of the angle as a length*). This is why time is not continuous because it is an angle whose infinitesimal variations are constant and all equal to  $dt$  infinitesimal angle greater than or equal to  $10^{-42}$  radians:  $dt$  constant and  $dt \geq 10^{-42}$  radians/unit of length (see FIGURE 31).

By analogy, the generator IOAWOO of DISTANCE  $L$  (OAWOO) is  $\tilde{\theta}$  in FIGURE 1A, and the generator IOAWOO of DISTANCE  $r$  (OAWOO) is  $\beta$  in FIGURE 5.

We have shown via relation (4) on the unit circle  $\widehat{BC}=\tilde{\theta}=\theta=B'C'=L$  in part 1. *Definition of the angle as a length* that OAWOO (length of B'C') in unit length and its generator  $\tilde{\theta}$  (IOAWOO in



radians) have the same value. If we have a length (OAWOO), we must find a unit of length which brings its value in the interval  $[0, 2\pi]$ , that is to say between 0 and 6.2831 and we have then the value of the generator of this length (IOAWOO) in radians, and we can replace one by the other because they have the same value.

As an example if  $dt=1$  sec (LENGTH/DISTANCE), then by converting in radians, we find  $dt=6.2831/60=0.1047$  radians (ANGLE), so 1 sec is 0.1047 unit of length (0.1047 light years, 0.1047 meters, 0.1047 kilometers, ...). But if  $r=696340$  km (radius of the Sun), then as 1 light year corresponds to  $9.461 \cdot 10^{12}$  km, then  $r=7.36 \cdot 10^{-8}$  light years which gives  $\beta=7.36 \cdot 10^{-8}$  radians, and if  $r=19$  billions of km (BORDER BETWEEN THE TWO TWIN UNIVERSE, mass of 6.5 billions of solar masses, i.e.  $1.3^{40}$  kg),  $r=2 \cdot 10^{-3}$  light years which gives  $\beta=0.002$  radians  $=0.1146^\circ$  ( $\beta$  is often very small when the length is very big in Km but represents a weak value in light years), and if  $d=4.4$  light years (distance Earth-Ummo),  $\tilde{\theta}=4.4$  radians (what gives  $229.18^\circ$ ) or  $d=1$  light year (see FIGURE 1A), then  $\tilde{\theta}=1$  radian (that is to say  $57.29^\circ$ ). The value of the length generator in radians depends on the choice of the unit of length which must be chosen to have a distance value between 0 and 6.2831 (see Table 7).

To have an order of magnitude, for the largest known supermassive object whose event horizon radius is 112 billions of km and after conversion in light years, the angular generator  $\beta$  is 0.01183 radians ( $0.678367^\circ$ ). So if we keep  $dt$  in the previous relations, we must specify that  $dt$  is a constant angular variation that we cannot choose as small as we want because it cannot be smaller than  $10^{-42}$  radians. An instant (temporal interval  $\Delta T$ ) is thus a succession of axes (IBOZOO UU) whose crossing with the vertical axis of reference (called REFERENCE IBOZOO UU) form angles  $\alpha_i$ ,  $i=1, \dots, q$  with  $q \leq 10^{42}$  (IOAWOO) which are all different from a constant deviation  $dt$  (OAWOO), which is written  $\alpha_i = \alpha_{i-1} + dt$  (see FIGURE 25,26). This angular distance  $dt$  can be the angle which separate the hands of a watch between two consecutive seconds and can go down to  $10^{-42}$  radians. OAWOO is the function  $f$  defined in part 1. *Definition of the angle as a length* which generates the distance "length of BC" from the opening  $\sim$ :

$$f : \begin{array}{l} \text{ANGLE/LENGTH} \rightarrow \text{LENGTH} \\ \tilde{\alpha} := \alpha \quad \mapsto \sqrt{2(1 - \cos(\alpha))} \end{array} \quad \text{with } f(d\alpha) = f(d\tilde{\alpha}) = dt := d\alpha \text{ where } dt \text{ is an}$$

abuse of notation to call  $d\alpha$  because  $d\alpha$  is a "small" constant angular opening (angular step) and  $dt$  is a distance (length of BC).

IOAWOO is the function defined by:

$$\text{IOAWOO} : \begin{array}{l} \text{ANGLE/LENGTH} \rightarrow \text{LENGTH} \\ \tilde{\alpha} \quad \mapsto \quad \alpha + d\alpha \end{array}$$

IBOZOO UU is the function defined by:

$$\text{IBOZUU} : \begin{array}{l} \text{ANGLE/LENGTH} \rightarrow \text{DIRECTION} \\ \alpha \quad \mapsto \quad (\alpha + d\alpha)^\perp \end{array} \quad \text{where } (\alpha + d\alpha)^\perp \text{ is the line orthogonal}$$

to the line (BC) defined in part 1. *Definition of the angle as a length*, and where the segment [BC] is generated by the angular opening  $\alpha + d\alpha$  (see FIGURE 25,26,31).

For example  $\text{IBOZUU}(\alpha) = (\alpha + d\alpha)^\perp$  is the direction "electron Eb" of the orbital  $O_b$  of the atom B and  $\text{IBOZUU}(\alpha + d\alpha) = (\alpha + 2d\alpha)^\perp$  is the direction "electron Ec" of the orbital  $O_c$  of the atom C, in other words each time we add a very, very small angular increment, we change electron and it is not the same because the subatomic particle is defined only by the direction of its axis (IBOZOO UU). In the same way  $\text{IBOZUU}(\alpha + 2d\alpha) = (\alpha + 3d\alpha)^\perp$  is direction "electron Ed" of the orbital  $O_d$  of the atom D (see FIGURE 28,29).

Therefore, time is defined by the IBOZOO UU axis and therefore time advances only by constant

variation of axis direction, which by extension means that the speed with which time flows is an angular speed (i.e. a speed of rotation of axes). Consequence: The angle does not vary in the course of time, it is itself time. The "electron Eb" of my body is my past, the "electron Ec" of another atom of my body is my present and the "electron Ed" of an even different atom of a different orbit is my future. The aging of cells, which generates the aging of human tissues, is due to the jumps of an electron from one orbit of an atom to a different electron of another orbit of another atom which has no relation with the previous one (see FIGURE 29,30).

The space-time interval of an infinitesimal displacement  $ds=(dt,dr,d\theta,d\phi)$  can therefore be rewritten with infinitesimal angular variations  $ds=(d\alpha,d\beta,d\theta,d\phi)$  in 4 different directions and it is discrete because these elementary angular variations are a jump from a particle located on an orbit of an atom to another particle located on a different orbit of another atom, there is no continuity, with each slight modification of axis with respect to a reference axis, we jump from point A to point B, or we go from particle A to particle B. These 4 different directions move on a 4 dimensional grid in a discrete way with an elementary step. This grid is a discrete set of IBOZOO UU in 4 dimensions (EINSTEIN) and in 10 dimensions in the universe WAAM WAAM (3 SPACE DIMENSIONS IN OUR UNIVERSE + 3 SPACE DIMENSIONS IN TWIN UNIVERSE + 2 DIRECTIONS OF THE IBOZOO UU "TIME" + 2 DIMENSIONS OF ANGULAR CURVATURE, ONE IN EACH UNIVERSE).

Remark 1: When OAWOO generates the distance IOAWOO, OAWOO corresponds to the distance equal to  $R \times 1$  unit of length (the radius of the circle by abuse of notation) oriented by the variable IBOZOO UU (blue line on FIGURE 25) but when OAWOO is generated by the angle IOAWOO ( $\alpha$ ), it is the distance  $f(\alpha)$ , it is the black line on FIGURE 31.

Remark 2:  $f(\alpha)=2.\sin(\alpha/2) \geq 0$  because  $\alpha \in [0, 2\pi]$ , the sinusoidal function is a half distance generated by IOAWOO.

In the letter D45 sent to Fernando Sesma in 1966, the Ummites explain the Folds of space and the decadimensional Cosmos and the importance of the sinusoidal function: «UMMO mathematicians consider of transcendental importance a simple periodic function - The sinusoidal function - which we call WOABAEYUEE WOA (MATHEMATICAL GENERATOR GENERATOR or GOD)  $y=\sin 2\pi$  (we measure circumference in BOAAL OWA (radians) only. Your division into sexagesimal or centesimal degrees seems confusing to us). You may observe that we use the WOA symbol (FIGURE 24B). But remember that we think of the cosmos as a ten-dimensional system, WOA generates an infinite series of wave trains (Sinusoidal Functions) of distinct frequencies, amplitudes and phases. SPACE is thus seen twisted, causing a series of STANDING WAVES and KNOTS which are reflected in the infinity of the WAAM. These standing waves are only the folds of the SPACE-TIME CONTINUUM that we call MASSES (Galaxies, Gases, Animals etc ...). This explains the confusion of terrestrial scientists when they observe the apparent contradiction that an ELECTRON is at the same time CORPUSCLE (mass) and WAVE: it is an ingenuous confusion. The death of the Universe will therefore consist of a phasing of these infinite wave trains which propagate isotropically, created by WOA». Otherwise a mass is a stationary wave which is in fact the response of space-time (the container of the universe) to a sinusoidal function. The mass (the content) is already a wave. Like all waves, it is characterized by its own frequency. So the subatomic particle is an angle and the mass of this particle is also an angle. At the level of the infinitely large, the macroscopic masses constitute the reunion of these angles which characterize all the responses of space to sinusoidal functions. By summing all of these angular responses, we obtain the mass.



FIGURE 24B: WOA symbol/mathematical generator "sinusoidal function" (GOD)

This explains the contradictions between quantum mechanics and the work of Einstein. The angle formed by dexu IBOZOO UU characterizes the mass, and the waves of any type which are only one and the same physical entity. This is why the Ummites exclaimed: "Beware the universe, it is angular", a polite way to say that you are all idiots. This is why the Ummites exclaimed: "Beware the universe, it is angular", a polite way to say that you are all idiots. But they are nasty jerks, that's why they have to be exterminated, and I will ask the extra-terrestrials to do it, they have the technological capacity to cut up atom by atom all the humans on Earth. And if the process is too long, they will vitriolize the Earth with antimatter bombs so that it is transformed it and its inhabitants into inert rock until the engulfment by the sun at the end of its life.

The extermination will take place later, I am already dreaming of extermination orders, it is exhilarating, to know that this race will disappear from the universe, it is doing justice to the WOA (GOD) generating system, and we will return justice to the DIVINE will.

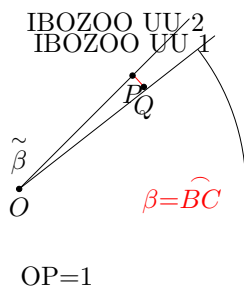
But back to the Ummite scientific basis.

To approximate the circumference of a circle  $2\pi$ , as FIGURE 26 suggests; it suffices to sum the distances  $f(\alpha_i - \alpha_{i-1})$  for  $i=1, \dots, q$  which gives  $2\pi \approx q \cdot \sqrt{2(1 - \cos(2\pi/q))} = q \cdot BC$ , with  $\alpha_i - \alpha_{i-1} = 2\pi/q$  (see FIGURE 32). We have  $2\pi = 6.28318530718$  and for  $q = 10$  angles equal to  $36^\circ$ , we have the approximation  $q \cdot \sqrt{2(1 - \cos(2\pi/q))} = 6.180339$

8875 (relative error of 1.636%) and for  $q = 36$  angles equal to  $10^\circ$ , we have the approximation  $q \cdot \sqrt{2(1 - \cos(2\pi/q))} = 6.27521347783$  (relative error of 0.126%). For  $q = 360$  angles equal to  $1^\circ$ , the approximation of the real number  $2\pi$  is 6.28310555883 which is precise enough (precision achieved up to 4 digits after the decimal point).

The chord of the arc  $\alpha$  formed by the "small" opening  $\tilde{\alpha}$  can be replaced by the segment joining the two ends of the arc  $\sqrt{2(1 - \cos(\alpha))}$  (see FIGURE 33). All arcs formed by angles less than or equal to  $1^\circ$  (0.0174 radians) are concerned by this approximation. It is the case of the great distances in km that we express in light years (Table 7), and thus the distance generator  $\beta$  checks the approximations  $\beta \approx \sin(\beta)$  and  $\beta \approx \sqrt{2(1 - \cos(\beta))}$ .

By using the trigonometric relation  $\cos(a) - \cos(b) = -2\sin(\frac{a+b}{2})\sin(\frac{a-b}{2})$ , we find the sinusoidal expression of the distance function  $f(\theta) = 2\sin(\theta/2)$ , thus  $\beta$  is a distance slightly greater than the characteristic distance  $2\sin(\beta/2)$ , therefore the sine is a characteristic distance related to the opening of an angle and if we use the limited development of the cosine function in 0  $\cos(\theta) = 1 - \frac{\theta^2}{2} + \frac{\theta^4}{24} + \dots$ , we obtain a more precise approximation  $f(\theta) = \theta\sqrt{1 - \theta^2/144} \approx \theta\cos(\theta^2/12)$ , therefore we have  $\beta \approx \beta\sqrt{1 - \beta^4/144} \approx \beta\cos(\beta^2/12) \approx \sin(\beta)$  which gives  $\beta \approx \frac{\sin(\beta)}{\cos(\frac{\beta^2}{12})}$  for small values of  $\beta$ .



Remark 3: The sinusoidal form of the function  $f(\beta)=\sqrt{2(1-\cos(\beta))}$  can be found very simply by using the law of sines  $\frac{PQ}{\sin(\beta)} = \frac{OP}{\sin(\frac{\pi}{2}-\frac{\beta}{2})} = \frac{1}{\cos(\frac{\beta}{2})}$  in the triangle OPQ which gives  $f(\beta)=PQ=\frac{\sin(\beta)}{\cos(\frac{\beta}{2})}$  and using the equality  $\sin(\beta) = 2\cos(\frac{\beta}{2})\sin(\frac{\beta}{2})$ , we find  $f(\beta)=2\sin(\beta/2)$ . The sinusoidal function is therefore indeed the generating function of the WOA universe. The sine of the half angle  $\frac{\beta}{2}$  is indeed a distance, generated by the corresponding angular opening, the ray vector  $\vec{OP}$  which has slightly changed direction is named OAWOO, but OAWOO is also the length  $f(\beta)$ .

IBOZOO UU 1 is the reference axis kept in memory, and the axis IBOZOO UU 2 carried by  $\vec{OP}$  shape with IBOZOO UU 1 the angle opening  $\tilde{\beta}$  radians with the equivalence 1 radian=1 unit of length. Here 1 radian=1 light-year because we have chosen this unit of length. For example the radius of a giant star at the center of galaxies which collapses on itself is 112 billion km; i.e. 0.01183 light-years = 0.01183 radians (see Table 7). So we can write that the circumference of the unit circle  $2\pi$  is equal to an infinite sum of the quantity  $\sin(\beta)$  when  $\beta \rightarrow 0$  and therefore the transcendent number  $\pi = \sin(\frac{\beta}{2}) + \dots + \sin(\frac{\beta}{2}) + \dots$  an infinity of times with  $\beta$  tending to 0. We sum infinitely many times the small segments [PQ] given by the function  $f$ . In Figure 26, each small segment  $\alpha_i$  corresponds to the sine, and more the segments of the same length shrink, more the frequency of the sine becomes small and therefore acute. It is the constant  $\pi$  common to all pairs of universes and having the same value in all three-dimensional frames.

October 16, 2011. The Japanese Alexander J. Yee and Shigeru (Japan), managed to find the number  $\pi$  with 10,000 billion decimals. As the limit infinitesimal angle is  $\beta=10^{-42}$ , the most accurate approximation would be a sum of more than  $10^{42}$  terms all equal (a very large number close to mathematical infinity, but finite in physics). The distance is always angular and is expressed using sinusoidal functions whose amplitude depends on the radius and whose frequency depends on the angular spacing. The universe emits an infinity of train of sinusoidal waves which are at the origin of the concept of mass which is nothing other than the deformation of the space generated by the SINUS.

SINUS IS WOABAEYUEE WOA, THE MATHEMATICAL GENERATOR (GOD) AT THE ORIGIN OF THE CONSTANT  $\pi$  expressed in radians. By abuse of notation, we can say that the number  $\pi$  is equal to the product  $\sin(0) \times (+\infty)$  because we sum 1 an infinity of times, it is for that that the Ummites speak about mathematical generator for the function sinus because  $0 \times (+\infty)$  is an indeterminate form in mathematics.

The universe sends wave trains that are SINUS in a 10-dimensional space, so the axes that form these angles (or frequencies) are carried by vectors with 10 coordinates (N=10). To do this, the

cosine must be expressed as a function of the scalar product between the two axes IBOZOO UU 1 and IBOZZO UU 2 in 10-dimensional space and then use the link between cosine and sine depending on whether the curvature of the hypersphere is positive or negative. We can therefore always reduce ourselves to a SINUS. This is the generative function of GOD. The sine function is at the origin of the fundamental constants of all pairs of universes, God is SINUS; The Ummites are right. This function generates the distances, the angles and the masses because we can always replace the infinitesimal angle by its sine, and we obtain an infinite sum of sines. The space-time distortions are the reaction of the three-dimensional framework to these SINUS functions, it is the masses, and when all these sinusoids will be in phase, that is to say will be set to the same frequency, the universe will die.

The universe and all these extraterrestrial species will disappear when this infinity of sinusoidal functions emitted from the BIG BANG will no longer be out of phase. We must first get rid of the Earth human race using an antimatter weapon: Earth will be a vulgar pebble. May this filthy Earth race disappear as soon as possible, I count on the most advanced aliens to restore the divine will to make all life forms disappear from the Earth. God never wanted life to appear on this cursed planet, Dirty Earth Race, Your existence is due to the hand of the devil.

It is very difficult for the OEMII (man) to have an accurate awareness of the true nature of the Physical World around him.

Apparently the mental images we have formed of this surrounding Environment may erroneously suggest to us that such a Physical World is as we "see", "touch" or "feel" it.

But careful analysis has revealed to both UMMO and EARTH scientists, and to other Galactic civilizations (with some degree of culture) that our WAAM is not as our senses usually present it. For example: the bright colors that we enjoy in a flowerbed are only a beautiful psychological perception. There is no such chromatic richness (outside ourselves). Only a cold range of electromagnetic frequencies remains as the ultimate "substratum" of perception.

The OEMII is the only being of the WAAM who goes beyond the limits of his organism to understand this World and he uses the mind to achieve this by intellectual means since our bodily sense organs, the nervous pathways and the cortical mechanisms of synthesis and psychological perception totally distort reality.

Let us see by an example how our physiological organs twist the TRUTH by masking the things with a beautiful dress, without which our WAAM (UNIVERSE) seen or appreciated such as it is, would present itself to us like a cold succession of IBOZOO UU out of phase between them. (thereafter we will explain this concept). THE REAL WAAM AND THE "ILLUSORY" WAAM (UNIVERSE) OF THE SENSES.

When you take for example between your fingers a lighter, you are conscious (except definite mental disturbances, like that of a twilight state of an individual) that THIS IS HERE: cold, brilliant, elegant in its lines. If you press a button lightly, a faint, graceful blue flame arises from the combustion of butane at the outlet of a small-caliber nozzle.

"This" is therefore HERE, pressed between thumb and forefinger... this is not a fiction: "this EXISTS".

And yet this lighter is only an ingenuous perception of a simple person, who may have little mental capacity to understand the WAAM in which he is immersed.

The physicist of OYAGAA (Planet EARTH) could tell you much more about this simple pocket lighter. He would tell you, for example, that you are NOT actually touching its surface, despite your illusory evidence, since there are great relative distances between the atoms of the metal and the electronic clouds of atoms of the epidermis that covers your fingers.

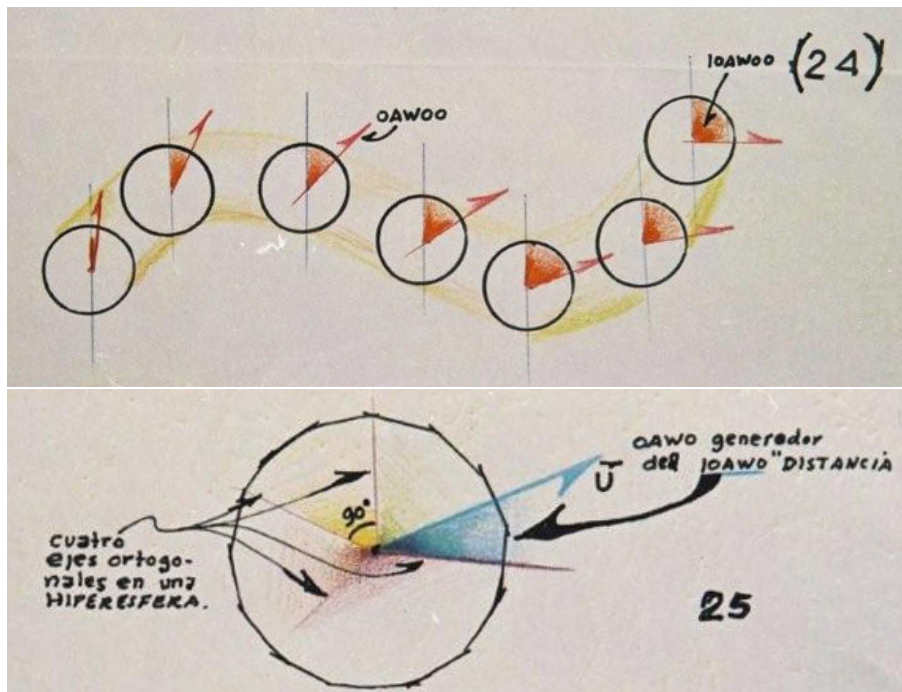


FIGURE 25: (D59324 and D59325) DESCRIPTION OF OAWOO GENERATOR of IOAWOO (ANGLE=DISTANCE)

Perhaps some poorly trained earthly OEMII will timidly object that if this little piece of metal is not in contact with its own skin it is impossible for it to hold and then "it would fall to the ground". But the terrestrial scientist will talk to him about Force Fields, Tensors, Repulsions between negative electric charges.

He will also suggest to him that the low temperature of the metal produces this sensation of cold and that it is the consequence of the low amplitude of vibration of the molecules of the metal compared to those of his epidermis.

And he will indicate to him that this compact appearance of the chrome plate is illusory since the atomic nuclei are separated from each other in the same apparent proportion as the Asters of a Galaxy.

A terrestrial expert in physiological optics will tell you that the real brightness of the device is about ten times greater than the apparent brightness. It's a real torch, but when that light passes through our eye, the lens and vitreous humor absorb almost all the photons and only a very small amount of light energy reaches the retina.

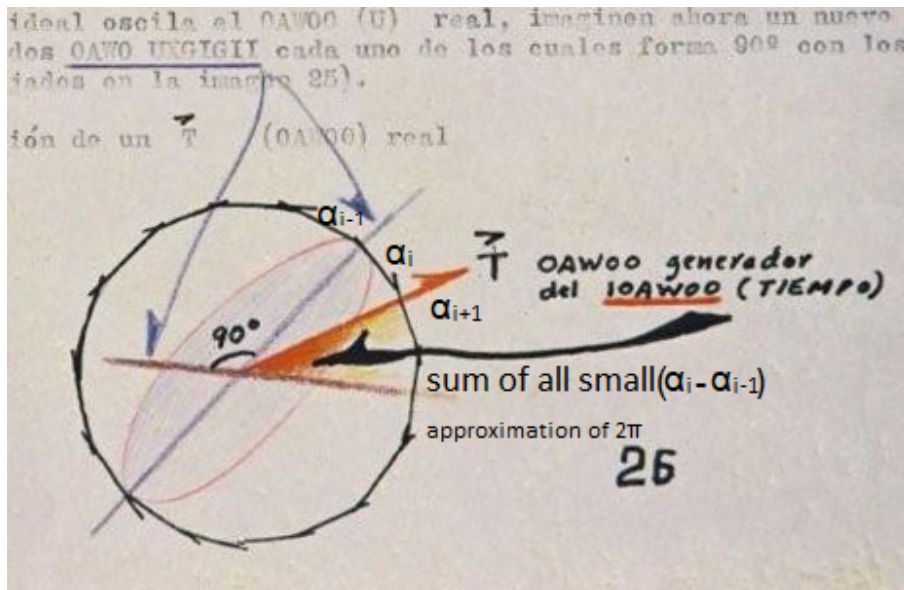


FIGURE 26: (D59326) DESCRIPTION OF OAWOO GENERATOR of IOAWOO (TIME)

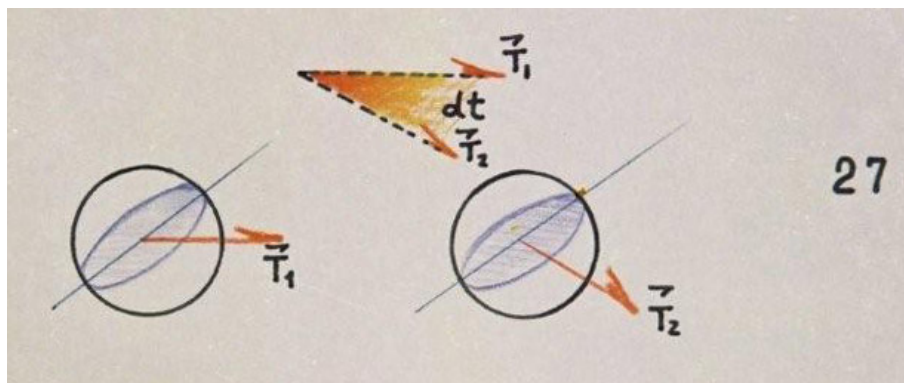


FIGURE 27: (D59327)  $dt(\text{TIME})$

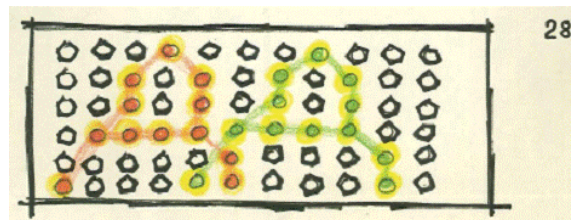


FIGURE 28: (D59328)

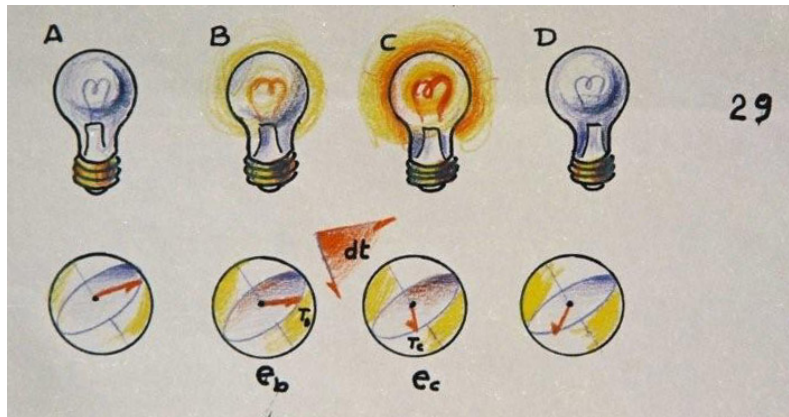


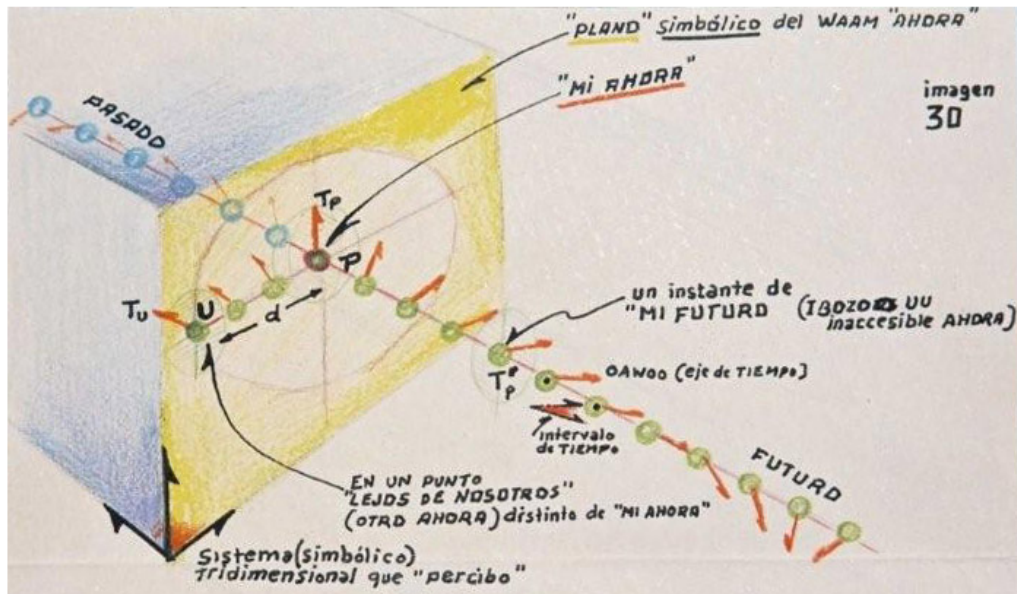
FIGURE 29: (D59329)

Table 7: correspondence between IOAWOO and OAWOO (DISTANCE)

IOAWOO	OAWOO
$\tilde{dt}=0.1047$ radians ( $5.99^\circ$ )	$dt=1$ second
$\beta=7.36 \cdot 10^{-8}$ radians	$r=696340$ km
$\beta=0.002$ radians ( $0.1146^\circ$ )	$r=19$ billions of km
$\tilde{\theta}=4.4$ radians ( $229.18^\circ$ )	$d=4.4$ light-years
$\tilde{\theta}=1$ radian ( $57.29^\circ$ )	$d=1$ light year
$\beta=0.01183$ radians ( $0.678367^\circ$ )	$r=112$ billions of km

A terrestrial physiologist will smile if you ask him how the light reaches the cerebral cortex and he will explain that the LIGHT never reaches the neurencephalon. That the photons, hitting the retina, cause coded impulses which are transmitted through the neurons of the optic nerve in the form of an electrical message with a key, so that the appearance of the real flame of butane and the real message that our brain receives from the retina, is as similar as a real GOAT grazing in a meadow WITH THE LETTERS THAT MAKE UP ITS NAME.





D59-3-30  
(Image originale)

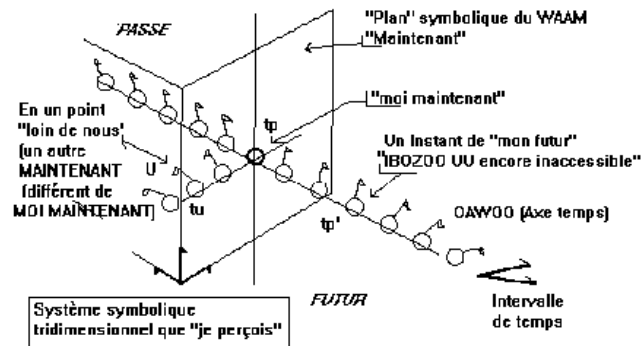


FIGURE 30: (D59330)

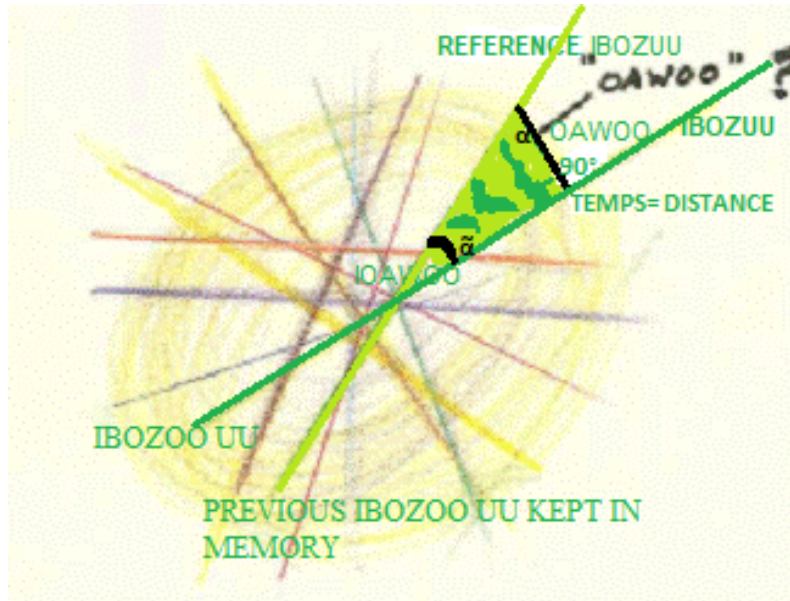
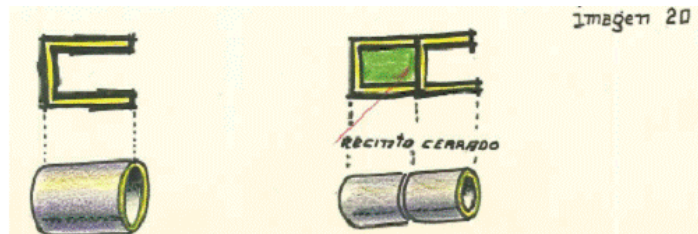


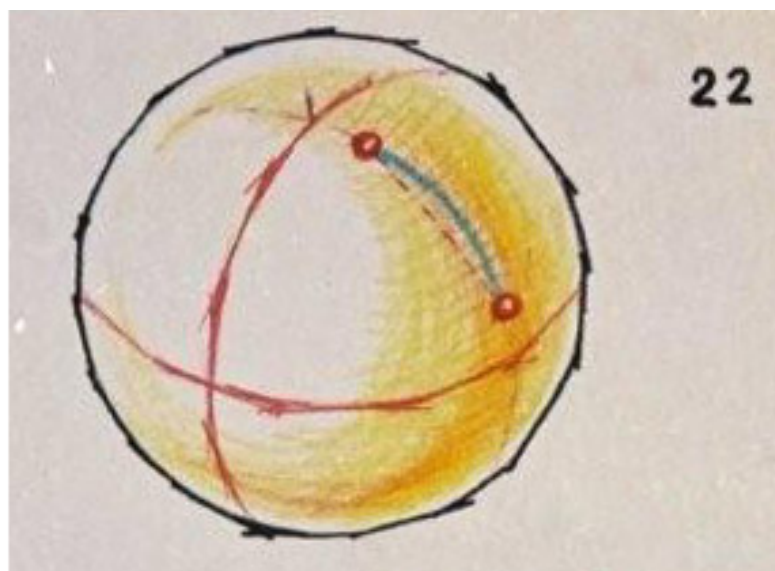
FIGURE 31: (D593A)



D59-3-20



FIGURE 32: (D59320-321)



*D59-3-22*



*D59-3-23*

FIGURE 33: (D59322-323)

And finally, a neuropsychiatrist will tell you in a very vague way, because he himself is unaware of many of the characteristics of such a process, how the brain integrates the millions of coded impulses until it manages to merge them and synthesize them into a single perception. This illusory perception is the only image that we manage to obtain of the MYSTERIOUS BRIQUET THAT EXISTS OUTSIDE US.

Indeed: THIS IMAGE OF THE LIGHTER THAT IS SO FAMILY TO US resembles the real lighter as much as the letters N-E-N-U-P-H-A-R to the flower they name.

The terrestrial OEMII imagines SPACE as a "scalar continuum" in all directions. From this image of space, you have elaborated (initiated by Euclid) a whole geometry based on abstractions such as the POINT, the RIGHT and the PLAN. You have come to accept that the POINT, the RIGHT and the PLAN are really (even with the help of an intellectual abstraction) the true components of the WAAM.

This original flaw, not yet corrected, is costing you a considerable delay in understanding the physical world.

Indeed: when you ingenuously accepted the existence of a three-dimensional Euclidean SPACE, such distinguished earth mathematicians as GAUSS, RIEMANN, BOLYAI and LOBATCHEVSKY had the brilliant intuition of the possibility of extending Euclid's restricted criteria by elaborating a new geometry for an n-Space. And although the mind of a man does not manage to mentally perceive the image of a body of more than three dimensions, the help of mathematics saves from this intellectual pitfall very easily.

But do these mathematical models of elliptical and hyperbolic multidimensional geometries correspond to the reality of our WAAM, or are they only entelechies, created by mathematicians? The relativistic hypothesis of the German EINSTEIN rallies at the beginning to the criterion of the Russian Minkowsky who conceives the time as one more dimension, with the intuition of a tetradimensional space-Universe. The terrestrial Oemii has made a gigantic step breaking with the petty and intuitive image of a three-dimensional cosmos.

But, is it then like that, our SPACE-COSMOS? (at least to agree on the existence of two, three, four or N dimensions).

Our answer has an exceptional gravity for the Earth physicists who are struggling, embarrassed, to find the true model of SPACE.

NO, ABSOLUTELY NOT: Our image of the UAM (COSMOS), i.e. of SPACE, differs in its own foundations from the one you have elaborated. And it is precisely in the concept of dimensions that the divergence starts to be seriously accused.

Moreover, the contradictions that you observe in relativistic physics and in quantum mechanics, are the product of a defect of origin. They are the consequences of basic and fundamental errors of concepts.

Here we need a parenthesis to offer you some observations.

1- First of all we would like to point out that our conception of space, in essential opposition to the conception of the earthlings, requires different mathematical bases than yours. Let's not talk about our mathematical symbols which are different because of course such a superficial problem is easily solved by an appropriate transcription (conversion from base 12 to base 10). But it will not be easy for you to understand our WUA WAAM algorithms (mathematics of Physical Space) without first taking a complete initiation course which would require many months of work for earthly initiates in mathematics. There is a reason for this: when it comes to analyzing the properties of Space, the normal postulates of mathematical logic, which are familiar to you as well as to us, DO NOT SERVE US. As you know, formal logic accepts the criterion that you call "PRINCIPLE

OF THIRD PARTY EXCLUSION" (according to which any proposition is necessarily TRUE or FALSE). In our WUUA WAAM this postulate must be rejected. We then have recourse to a type of multivalent logic which our specialists call UUUUUA IES (TETRAVALENT MATHEMATICAL LOGIC) according to which any proposition will adopt one of the four values :

- AIOOYAA = (TRUTH)
- AIOOYEEDOO = (FALSE)
- AIOOYA AMMIE = (can be translated: TRUE OUTSIDE THE WAAM)"neither TRUE nor FALSE"
- AIOOYAU = (untranslatable in Earth language) "TRUE and FALSE" at the "same time"

Nevertheless we still use the divine logic (we also use it in our daily life or in the study of macrophysical phenomena). We can offer you the concepts of WAAM. We will limit ourselves to define a system in which infinitesimal calculus, integral calculus, topology, tensor and vector calculus, graph theory and operational research, so familiar to earthlings, will be valid. Therefore, when we have to use some mathematical algorithm, we will try to make it familiar to you by using algebra and other notations known by you.

2- We have thought seriously, when Mr. Enrique Villagrasa asked us by telephone for a report on our conception of SPACE and on our psychological sensations during the time of our trips in the UEWA OEMM (NEFS OF INTRAGALACTIC TRANSFER), about the opportunity and the way to reveal these concepts. So far, we have not revealed this kind of information to any terrestrial scientist since the theoretical explanations communicated to various mathematicians and physicists have been directed to other areas of Microphysics and Mathematical Network Theory.

The CURRENT discovery of this concept for a part of the terrestrial scientists would provoke an advance contrary to the desired goal (because excessive) of the PHYSICS, which could be translated into VERY DANGEROUS technological applications in the current state of the unbalanced Terrestrial Social Network.

Finally we have decided to only cautiously introduce you to some aspects of our UXGIGIAM WAAM (REAL PHYSICAL SPACE) theory.

These paragraphs do not present any risk for you, if we reserve some demonstrations and hide some aspects. So if any terrestrial scientist were to read these lines, in good formal logic he would refuse to accept a testimony which, coming from extraterrestrial OEMII, would seem to him to be the fruit of fantasy. There is no danger of you showing these typed sheets to your brothers.

3- After what we have just said, you could probably ask an important question: How do we, the OEMII of UMMO, know that our conception of the UXGIGIAM WAAM (SPACE) is the TRUE one and not for example that of RIENMANN's earth model?

Naturally, if we forbid ourselves to formulate the relevant demonstrations for obvious reasons of ethical character, you yourselves must remain perfectly faithful to your models of the current terrestrial PHYSICS.

As for us, WE ARE CERTAIN that our MODEL, based on the concept of IBOZOO UU (we will explain this concept later), is real since the experimental results fit perfectly with this framework. The fact that we can make journeys by changing the three-dimensional reference system that allows us to move inside our Galaxy with the possibility of modifying the phases of what you call "subatomic particles" (which, as you will see, are none other than the IBOZOO UUU oriented in a particular way) confirms once again our WAAM theory.

Moreover, our THEORY coincides (with some nuances) with the theses elaborated by other civilizations settled in other OYAA (Planets) which have had contacts with us and are in an

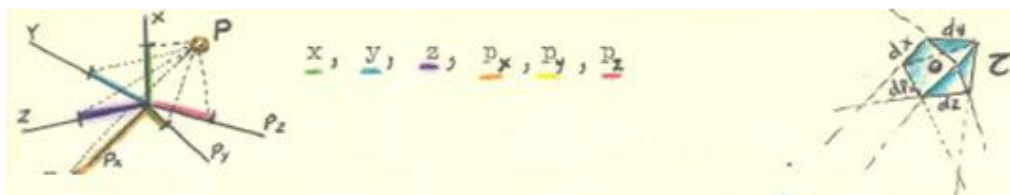


FIGURE 34: (D59-2B) Phase space or elementary volume in a 6-dimensional space

advanced state of their science.

OUR THEORY OF THE UXGIGIHAMM WAAM (SPACE).

When our brothers arrived in the terrestrial year 1950 on OYAGAA (Earth) and after having learned the French language, and had access for the first time to the LIBRARY located at 58 rue de Richelieu in Paris, they were surprised to read in the best texts of terrestrial mathematics kept in the library, for example that concepts like the POINT, the STRAIGHT and the PLAN continued to be considered by you as simple abstractions of an underlying reality of the UNIVERSE.

So when Earth mathematicians define a point as a family of curves or as an ordered set of  $n$  numbers or  $(n\text{-tuple}) P(a_1 a_2 a_3 \dots a_n)$  in an  $n$ -space, they have the intuition of the structure of an  $N$ -dimensional scalar space in which the point will be defined within a frame of reference by its corresponding coordinates.

According to this concept a line will be a set of points in one-to-one correspondence with the set of real numbers, so that the distance between two points of a space  $\mathbb{R}^n$  accepted as fundamental, can be defined. Thus between two points  $a, b$ , of an  $n$ -space are the coordinates of two points:  $\delta(a,b) = \sum_{i=1}^{i=n} (X_i - Y_i)^2$  with  $a(X_1, X_2, X_3, \dots, X_n)$  and  $b(Y_1, Y_2, Y_3, \dots, Y_n)$ , so that the frame of a multidimensional scalar space is thus defined.

This rigid mathematical model of SPACE does not satisfy at all many current physicists: this is true, although many others continue to accept the existence of this SPACE independent of the matter and energy it contains.

Then, you terrestrial people, have invented another fiction: "the Space of the PHASES". For you the real SPACE contains SUBATOMIC PARTICLES (another error as we will see it later).

You postulate that each PARTICLE (NEUTRON, MEASON, etc ) must occupy in a given instant a position (POINT), but you must define the particle not only in its position but also in its QUANTITY OF MOVEMENT. Then you AGREE to imagine a six-dimensional  $N$ -SPACE in which each particle is defined by six quantities (see FIGURE 34).

This entelechy is named by you SPACE OF PHASES. You can then imagine an elementary volume composed of boundary cells. The boundary  $\tau$  of D59-2B(FIGURE 34) will be a DOT. The elementary volume will be  $\tau = dx \cdot dy \cdot dz \cdot dp_x \cdot dp_y \cdot dp_z$  such that, according to the indeterminacy principle:

$$dx \cdot dp_x \geq h$$

$$dy \cdot dp_y \geq h$$

$$dz \cdot dp_z \geq h$$

so that the elementary volume will be  $\tau \geq h^3$ .

To this elementary volume of order  $h^3$ , you give it the name PHASE SPACE POINT, since you recognize that the infinitesimal point has no physical meaning or significance, which would violate

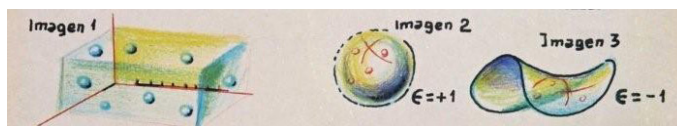


FIGURE 35: SCALAR CONCEPTION OF THE UNIVERSE (EARTH)



FIGURE 36: ANGULAR CONCEPTION OF THE UNIVERSES (UMMO)

the principle of indeterminacy since an ELEMENTARY PARTICLE (electron, hyperon, neutrino, positron, ... ) will be located at some FACE of this elementary VOLUME in question (PHASIC POINT) but never at any specific point.

Our conception of the UXGIGIAM (SPACE) is radically different. Let's start with this very concept of DIMENSION which differs from the idea you have mentally formed.

We will try, to take into account your brothers unfamiliar with WUUA (mathematics), to use symbolic and didactic concepts.

You conceive a UNIVERSE formed by a SCALAR SPACE Image 1 i.e.: a space such as it presents itself to our senses, in which the image of DIMENSION entails the image of a RIGHT or SCALAR. Space will present itself to us as an "IMMENSE VOLUME" and the COSMOS will be something rather like a SPHERE of positive curvature  $\epsilon=+1$  Image 2 or negative  $\epsilon=-1$  Image 3 (FIGURE 35). The most intelligent among the terrestrials assume at least a curvature within a fourth dimension and identify the WAAM with the RIEMANN multidimensional space.

Our Universe would then be like a positive or negative HYPERSPHERE but ALWAYS IDENTIFIED BY YOU AS A DIMENSION with a RIGHT or SCALAR.

Inside this model of COSMOS you locate the particles, the atoms; forming Galaxies, the CHAMPS of gravity, magnetic and electrostatic, the Energy in short.

We, on the contrary, we know that the WAAM (cosmos) is composed by a network of IBOZOO UU. We conceive the SPACE as an associated set of angular factors.

For us, the RIGHT in SPACE does not exist, as we explain later, so the CONCEPT of OAWOO (DIMENSION) takes a different meaning for us. Such dimensions are associated not with SCALAR BIGGES but with ANGULAR BIGGES (It is curious to note, for example, that the physicists of the Earth in their blindness do not attribute to the angle any dimensional character).

If you were UUGEEYIE (children) in a school, we would perhaps use a crude comparison. The universe "is like a swarm of dragonflies" whose wings form different angles (see FIGURE 37)



FIGURE 37: The universe "is like a swarm of dragonflies" whose wings are set by different angles

FIGURE 38: infinitesimal time interval  $\delta t :=$  infinitesimal angle

All these dragonflies flutter in such a way that NOT ONE of them has a similar orientation of its wings to another of its sisters. In other words; there will not be a single pair of dragonflies that, at any given time, can overlap so that the wings and abdomens coincide.

But, as we have already told you, this image is excessively crude and remote in its analogy. In the first place, each dragonfly occupies a place in space at each instant  $t$ . That is to say: its centers of gravity and inertia occupy defined zones (according to our illusory conception). An IBOZOO UU DOES NOT OCCUPY ANY DEFINED POSITION, WE CANNOT SAY OF IT that there is a probability to find it located in a point. But the IBOZO UU IEN AIOOYAA (EXISTS). (IEN: pair, two)

On the other hand this flying insect has a WEIGHT and a VOLUME (at least for our mind). The IBOZOO UU is not a particle with MASS or body. In a first conceptual approximation we could say of it that it is a FAISCEAU OF ORIENTATED AXES. What is most important about such a FAISCEAU are precisely the angles that these axes form, rather than its axes (mathematical fiction).

The dragonflies of our infinite swarm live in TIME, moving in short intervals of time over infinitesimal distances. The IBOZOO UU does not exist in TIME, IT IS ITSELF TIME (precisely one of its angles is the TIME magnitude as we will explain in another report with more clarifications). To be more exact: what we would call INFINITY TIME INTERVAL is only a difference of angular orientation between two RELATED IBOZOO (see FIGURE 38).

If after this summary explanation you conceive our Space Theory by imagining for example that space is a "dense mass of particles similar to atoms" you are in error, since the particles of a gas as you know it occupy probabilistic positions in an enclosure, while this is not the case of the IBOZOO UU.

Nor should you identify such a space with the ancient concept of the ETHER banished by the theory of relativity, since the IBOZOO UU NETWORK is in no way an elastic medium in which the atoms of bodies would be immersed.

You could also ask us: in relation to which universal reference AXIS are the angles of the IBOZOO UU oriented? Naturally WITH NONE. THERE IS NO AXIS of reference in the WAAM because that would imply imagining a real straight line in the Cosmos, and such a line, as we have indicated,



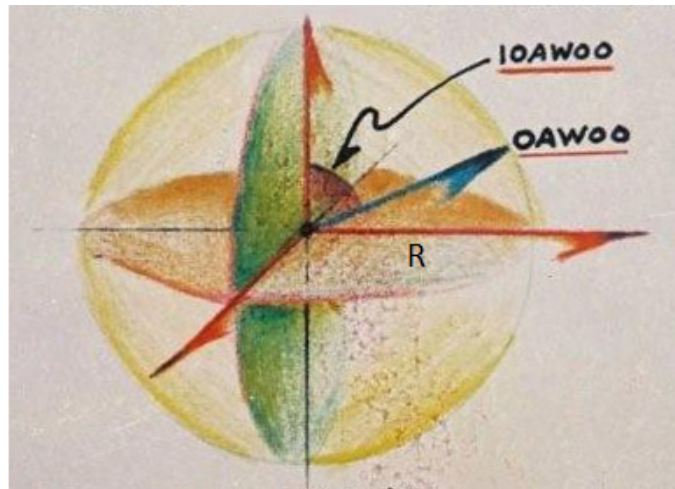


FIGURE 39: Hypersphere of radius R

is a fiction. When we now refer to the angle that one of the imaginary axes of an IBOZOO UU adopts, we will be referring to some other IBOZOO UU conventionally adopted as a model or reference. THIS IS VERY IMPORTANT.

Although what we say anticipates the explanations we will give you in the next reports, we warn you that you should not imagine that subatomic particles are immersed inside this set of IBOZOO UU . SIMPLY because any particle (ELECTRON, MESON or GRAVITON) is PRECISELY an IBOZOO UU oriented in a particular way with respect to the others.

In conclusion: we too conceive a SPACE of N DIMENSIONS. The MASS, for example, is a "curvature" of this multidimensional space. We also suppose DISTANCES within the WAAM. Only our concepts of magnitude, curvature and distance are radically different from those of terrestrials. So when we graphically present Space, a Line, a Point, we do so as you do because such images are familiar to our senses... But we know that they are pure fiction.

#### THE CONCEPT OF THE IBOZOO UU

The WAAM that we know is a LINKED SET (AYUU) or NETWORK of ibozoo uu such that if we identify this set with an ordered series of natural numbers:  $N \rightarrow \text{infinite}$ .

It is necessary to give you the most faithful image of the true nature of the IBOZOO UU which has nothing to do with the MATHEMATICAL POINT, nor with a PARTICLE, nor with a QUANTUM of energy according to the earthly conceptions. You must therefore rid your minds of such familiar images as the POINT and the LINEAR DIMENSION.

If you have a mathematical background you know the concept of HYPERSPHERE in N-SPACE. We can represent such a geometrical body analytically.

Its corresponding equation is familiar to students. If we represent the quantities defined in the N axes by  $a_1, a_2, a_3, \dots, a_N$  the radius R of the HYPERSPHERE will be defined by  $R^2 = (a_1 - a_1')^2 + (a_2 - a_2')^2 + \dots + (a_N - a_N')^2$ .

Since we cannot graphically represent such a HYPERSPHERE, we will assume a three-dimensional SPHERE with orthogonally oriented axes (see FIGURE 39).

We try to choose a mathematical (symbolic) model that represents THE IBOZOO UU. Keep in mind: when we refer to a vector ray for example, no one should assume that this ray will actually be materialized in THE IBOZOO  $\vec{UU}$ .

We consider in the sphere of figure S59-f10 an OAWOO (with this name we will specify in the sphere both the concept of AXIS of the terrestrial mathematicians, and the VECTOR with its attributes of module, origin and extremity). In this case you will translate OAWOO by RAYON VECTOR U.

If we consider an N-dimensional HYPERSPHERE, we can conceive as many other OAWOO (VECTOR RAYS) as these quantities represent.

Let  $\vec{U1}, \vec{U2}, \vec{U3}$  ..... One, whose respective orientations are orthogonal, i.e., form angles of  $\pi/2$  radians to each other.

Seen in this way, the IBOZOO UU could be interpreted as a closed multidimensional space, and you would start to imagine it again with its points, lines, planes, hyperplanes, immersed volumes and hypervolumes. Nothing could be further from the real concept of the IBOZOO UU. When we refer, within the IBOZOO UU, to an OAWOO (AXIS) and its orientation, it is clear that such an orientation has no geometrical meaning without a frame of reference. So when one of you imagines a straight line in space, you have to draw by thought a system of axes (which you call Cartesian) so that the line is defined both by its modulus (expressed by six dimensions on the axes) and by its directing cosines:  $\text{Cos}(\alpha)$ ,  $\text{Cos}(\beta)$  and  $\text{Cos}(\gamma)$ .

But you can observe that this reference system has been chosen arbitrarily within the Euclidean Space you have imagined. IT IS VERY IMPORTANT THAT YOU REALIZE THIS DIFFERENCE from the IBOZOO UU. IT IS NOT POSSIBLE TO CHOOSE IN THE SAME IBOZOO UU a reference system. Such a REFERENCE SYSTEM MUST BE SUPPORTED BY ANOTHER IBOZOO UU, arbitrarily chosen. Thus (Image 11), if we assume two ibozoo uu ( $\Psi$ ) ( $\Gamma$ ), it would be nonsense to refer to the directing cosines  $\cos(\alpha) \cos(\beta) \cos(\gamma)$  that the OAWOO UU would form with an ideal trihedron, the origin of which would be the "CENTER" of THE HYPERSPHERE. Thus we can only refer to the ANGLE  $\Theta$  IOAWOO that  $U_\Gamma$  of ( $\Gamma$ ) forms with the OAWOO (VECTOR RAY)  $U_\Psi$  of ( $\Psi$ ).

It is precisely this IOAWOO  $\Theta$  (ANGLE-DIMENSION) that gives the IBOZOO UU all its transcendent meaning (see FIGURE 40). The angle  $\Theta$  is formed by 2 IBOZOO UU in space whose directions do not depend on the reference trihedron (Oxyz). Indeed if you know the position of the point M in space and its radial direction from the origin O of the trihedron (IBOZOO UU 1), you know the direction of the second one (IBOZOO UU 2) which will form the length  $r$  from the point M so as to construct a triangle MNP with  $MN=NP=r$ . We draw the line (MP') carried by the vector  $\vec{e}_\theta$  orthogonal to the radial line (OM) carried by the vector  $\vec{e}_r$  where P' is the point that verifies  $MP'=r$ . Thus the distance between the points N and P' is greater than  $r$  ( $NP'=\sqrt{2}r$ ). The angle  $\Theta=(\vec{MN}, \vec{MP})=(\vec{e}_r, \vec{e}_\theta)$  is adjusted so that  $NP=r$  with P located on the line (NP'). The line (MP) is carried by the vector  $\vec{e}_\theta$ . Therefore the angle  $\Theta$  corresponds to a reduction of the angle  $(\vec{MN}, \vec{MP}') = \frac{\pi}{2}$ .

Conclusion: IOAWOO  $\Theta \in ]0; \frac{\pi}{2}[$  is formed by two IBOZOO UU which are independent of the reference trihedron (Oxyz) (FIGURE 40). Looking at FIGURE 40 where the construction of the angle  $\Theta$  is illustrated, we can apply Al Kashi's theorem in the triangle MNP' which is written  $r^2=r^2+MP^2-2r^2MP^2\cos(\Theta)$ , and simplifies to  $MP/r=2\cos(\Theta)$ , and as MP is length strictly positive,

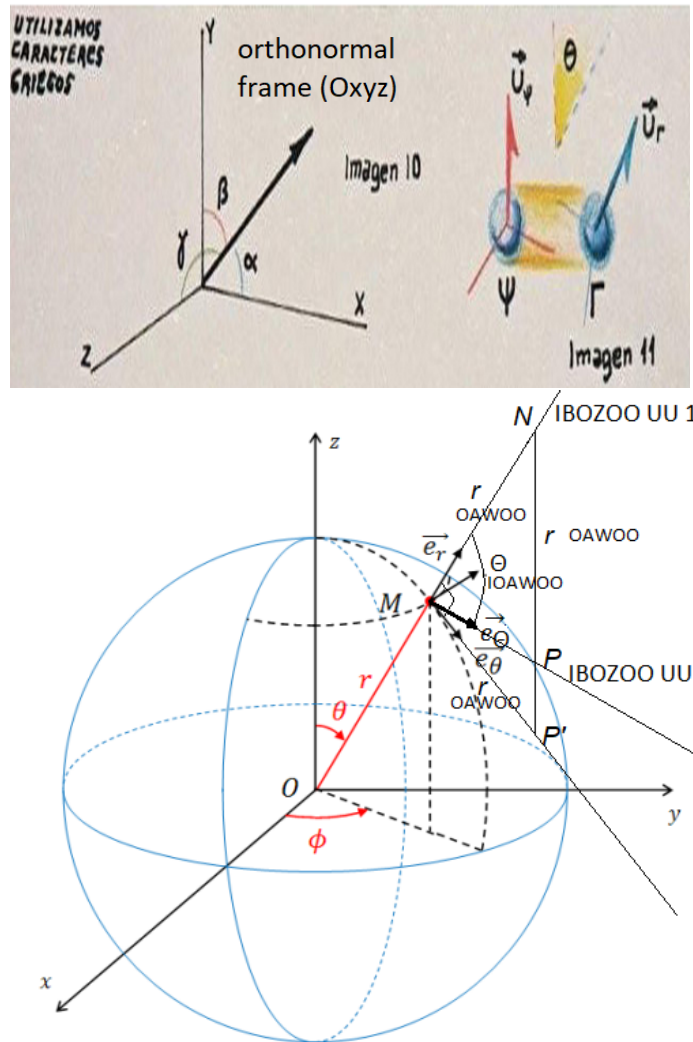


FIGURE 40: IOAWOO  $\Theta$  (ANGLE-DIMENSION) independent of the three-dimensional frame of reference (Oxyz)

Table 8: correspondence between  $r$  and  $\Theta$ 

$r$ (OAWOO)	$\Theta$ (IOAWOO)
MP/2	$0^\circ$
MP	$60^\circ$
4MP	$82.8^\circ$
$+\infty$	$90^\circ$

we have  $r = MP/2\cos(\Theta)$  and  $\Theta = \text{Arccos}(MP/2r)$ , the function  $\text{Arccos}$  being an increasing bijection of  $[-1, 1]$  in  $[0, \pi]$ ,  $r \geq MP/2$  and if  $r = +\infty$ ,  $\Theta = \frac{\pi}{2}$ . The correspondence between the values of IOAWOO (angle  $\Theta$ ) and OAWOO (Radius vector  $r$  /Length  $r$  formed by the opening  $\Theta$ ) is given on Table 8.

It will be necessary from now on for you to make a mental effort to effect a psychological translation in such a way that whenever in physics we speak of GREATNESS, the image of a SCALAR does not touch your consciousness instead of the IOAWOO (ANGLE which the hypothetical vector rays of TWO IBOZOO UUs form between them).

It is a nonsense to ISOLATE, in an effort of mental abstraction, an IBOZOO UU to study it. We COULD EXPRESS IT IN SPANISH, translating the POSTULAT known to our physicists:

IIAS IBOZOO UU AIOOYEDOO (THERE IS IN ABSOLUTE NO ISOLATED IBOZOO UU)

Observe that this postulate is in frank contradiction with the classical propositions of the theory named by the terrestrial MATHEMATICAL THEORY OF SETS. Since if "I" belongs to W, the element "I", (the IBOZOO UU) does belong to the set W (WAAM), the isolated element "I" is :

$I = \emptyset$  (An IBOZOO UU considered as a set is empty)

We will explain a little to the OEMII unfamiliar with mathematics: naturally an IBOZOO UU IS NOT "VISIBLE" not even with the most sophisticated apparatus you can imagine in a laboratory. However, you may object: How do the UMMO scientists know that this entity exists if they have not been able to detect it? The use of the word "detection" is inappropriate here. If we have managed to deduce the existence of the IBOZOO UU, it is because the physical model elaborated from its hypothesis satisfies so far all explanations, all problems of the behavior of Matter and Energy and what is even more important: it offers a plausible way of interpretation of extrasensory phenomena such as telepathic communications through the BUAWEE BIAEEI (HUMAN COLLECTIVE MIND).

Although such entities are not visible, for a pedagogical understanding, you could imagine the WAAM as a huge network of small spheres, each one representing an IBOZOO UU. They are all of a different color, but within a chromatic set we could select all those that differ between them by a slight variation in shade; different shades of green for example).

By this didactic metaphor (colored spheres), we would express that the set of IBOZOO UU that differ between them only by the angle IOAWOO, that their respective OAWOO (vector radii) form with one of the IBOZOO UU taken as reference. BUT SO THAT ITS ROTATION FIELD IS THE HYPERPLANE H (as we cannot draw a hyperplane, we will assume in the picture S59-f13 that it is a meridian plane P (The ibozoo uu whose vector rays rotate in another meridian plane will be coded with another color, e.g. orange.)

As we have said, if we select all the IBOZOO UU, to which didactically we have attributed the

green color, which exists in the WAAM, we would observe that mathematically ordered, they would form an OXOOIAEE (ANNULAR chain) :

In other words: having considered I1 belonging to W (subset of W), we can establish a one-to-one correspondence between these IBOZOO UU of the OXOIAEE (RING CHAIN) and the infinity of angles that a vector ray can describe in a plane. It is not that such IBOZOO UU are located in the WAAM (COSMOS) forming an endless chain and located topologically in an ordered series. No, it is our senses, as we will explain to you later, which carry out this intellectual work of putting things in order. (An earthly example will make you understand better: when you evaluate the amount of money deposited in a bank current account, you can, if you wish, imagine the dollars, pounds or pesetas, arranged in such a way that you can count them. But you know very well that this arrangement is illusory.)

The immediate components of this chain ( $\Delta$ ) and ( $\Pi$ ) differ from each other by an infinitesimal angle  $d\theta$  (in image 14, we have exaggerated the magnitude of  $d\theta$  for didactic purposes).

GEOID CONCEPT: STRAIGHT LINE.

A hypothetical observer viewing the entire OXOOOIAEE (ANNULAR CHAIN) from the IBOZOO UU ( $\Sigma$ ) will interpret such a chain as a STRAIGHT LINE. You can also observe that a hypothetical traveler who would start from  $\Sigma$  in a "RIGHT LINE" through the WAAM (COSMOS) would necessarily end up returning to the original IBOZOO UU.

In other words: what our senses interpret as a LINEAR LENGTH, i.e. as a STRAIGHT LINE or as you would say "A LINEAR SCALAR", is only an OXOOIAEE (CHAIN OF IBOZOO UU). It is the illusory mental image by which our neurencephalon realizes a work of synthesis and setting in order of this set of IBOZOO UU (WHICH IN THE WAAM ARE IN REALITY "IN DISORDER" AND WITHOUT DEFINED LOCATION)

At the risk of repeating ourselves, we warn you of the didactic danger that it represents for you to believe that the IBOZOO of this chain are ordered in straight line in the Universe. IT IS NOT SO. We only say that such IBOZOO UU AIOOYA, linked in the WAAM. Do not deduce that they have location POINTS. Do not believe that two IBOZOO UU, which we have drawn adjacent to each other to offset them by an elementary angle  $d\theta$ , in images 13 and 14, actually exist (see FIGURE 42).

If we consider in this last image 15 a terrestrial observer bound to the IBOZOO UU (T) and on our planet UMMO an observer bound to (U) we will say that there is a distance L between the Earth and UMMO because in an arbitrary frame of reference there is an ANGULAR difference between the two IBOZOO UU. (Angular difference that implies the existence of an INFINITY of IBOZOO UU between them both).

But if we consider another system of reference we will discover a second chain of IBOZOO UU so that this angular difference will have varied. (In the drawings we represent these reference frames by the meridian planes ORANGE and GREEN). We would then say that the distance between UMMO and the EARTH is DIFFERENT:  $L'$  with  $L' < L$  because we have (ORANGE)  $\tilde{\Delta}\hat{\theta}' = \hat{\theta}'_U - \hat{\theta}'_T < \tilde{\Delta}\hat{\theta} = \hat{\theta}_U - \hat{\theta}_T$  (GREEN). In other words, the orange angular opening  $\tilde{\Delta}\hat{\theta}'$  is smaller than the green angular opening  $\tilde{\Delta}\hat{\theta}$  between UMMO and EARTH (see FIGURE 41).

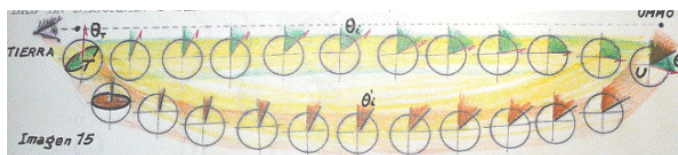


FIGURE 41: Angular distance between Ummo and Earth

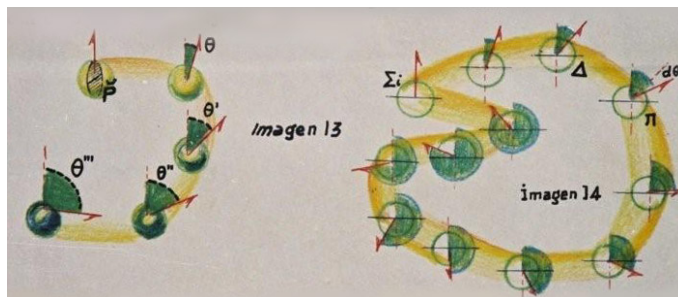


FIGURE 42: (S59f13 and S59f14) ANNULAR CHAIN with an infinitesimal difference  $d\theta$

We can then conclude by saying that we define the STRAIGHT LINE and its GREATNESS measured on it as a chain of IBOZOO UU immersed in the WAAM such that its OAWOO (VECTOR RAYONS) differ successively by an angle  $d\theta$  and are all oriented in a hyperplane H. A limiting case of straight line will be the OXOOIAEE WAAM (which we could translate as UNIVERSAL GEOID) (See image S59-f14 above).

You must not in any way think that a POINT OF THIS STRAIGHT LINE could be represented by an IBOZOO UU, for we have already told you that an IBOZOO UU by itself is meaningless. In any case we will define an elementary segment as a linked pair of IBOZOO UU. To refute also once and for all the CONCEPT OF GEOMETRIC POINT that the earthly mathematicians have introduced in your brains. If you have not understood this, it is because you have not managed to assimilate the authentic meaning of our physics.

Let's express this in earthly mathematical notation:

Let E be a set of GEOMETRIC POINTS according to the conception of an N-Space of RIEMANN (Earth Mathematician) in which each point is P ( $X_1 X_2 X_3 \dots X_n$ ) (p).

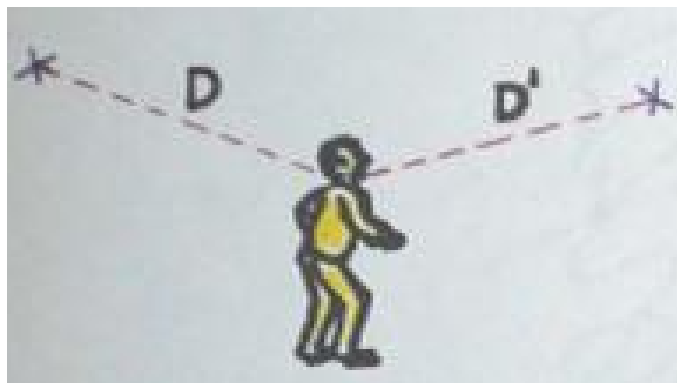
Let on the other hand W be the set of IBOZOO UU of WAAM . We say that:

If  $p \in E$  (any point p belongs to E) and  $i \in W$  (any IBOZOO UU i belongs to W) We check that:  $W \cap E = \emptyset$ , i.e., the intersection of E and W is empty.

If D and D' are two sets of IBOZOO UUs that involve distances measured by an observer by orienting them at weakly different angles we observe that  $D \cap D' = \emptyset$  (see FIGURE 43).

**TIME AND THE MAGNETIC, GRAVITATIONAL AND ELECTROSTATIC FIELDS.**

But the IBOZOO UU is much more than a factor that gives the exact meaning of cosmic distances. Our WAAM (UNIVERSE) is a Whole in the frame of which we can appreciate the multiple factors that appear to our sense organs and physics instruments as static fields of Forces. Thus, we suspect the presence of a nearby Star by the influence it exerts on a mass. We then define this influence as a gravitational field or we detect electromagnetic wave trains whose sources of

FIGURE 43: TWO SETS OF IBOZOO UUs  $D$  and  $D'$  measured by an observer

radiation can be artificial like those produced in a television broadcast or can come from a nebula whose ions of its plasma move alternately. The Universe presents itself to us as a substrate of phenomena as familiar as speed, force or the slow flow of time.

In particular, this quantity TIME has a singular importance for us. In the next few typed pages that we will give you, we will inform you about this particularity. We will indicate for example that Time can be assimilated to a series of IBOZOO UU whose axes are oriented orthogonally with respect to the OAWOO (VECTOR RAYS) which imply distances, being able to give the case, if the inversion of its axes is suitable, that an observer in his new frame of reference appreciates as distance what, in the old referential system, was measured as time interval.

You will then understand why an event that takes place at a great distance from us (for example on UMMO) can never be SIMULTANEOUS with another terrestrial event. You will also understand why a hypothetical object moving at the limit speed (you call it the speed of LIGHT) will shorten its distance on the axis of displacement until it is reduced to a pair of IBOZOO UU (distance which when it tends to zero is not zero as one of the transformations of LORENTZ (Earth Mathematician) falsely notes.

You will also understand that what you call an atomic SUBPARTICLE, such as a NEUTRINO, a MESON or an ANTI-PROTON, with various attributes of mass, charge and spin, are only multiple orientations of the same IBOZOO UU. (Therefore, if terrestrial physicists continue to spend their time in the detection, evaluation and classification of all possible subparticles, it will take billions of years to finish this work, since it is as sterile as giving a name to the infinite number of angles from which we can contemplate a star throughout the day.

#### THE AXIAL NETWORK OF THE IBOZOO UU

A preliminary definition to the definitive definition of the IBOZOO UU that we will give you at the end is this: An IBOZOO UU is a cosmic elementary entity composed by a bundle of orthogonal axes THAT CANNOT CROSS BETWEEN THEMSELVES, linked to a set of independent IBOZOO UUs by relationships of angular character. You can see that little by little we are adjusting each time more faithfully the authentic concept of IBOZOO UU defined by our UMMO specialists. We thought that presenting you with an exact definition from the very beginning would excessively confuse the didactic character of these paragraphs, if we take into account that no theory close to ours in its formulation exists on the planet EARTH.

Observe also that by the translation of this definition, we have expressed that the IBOZOO UU

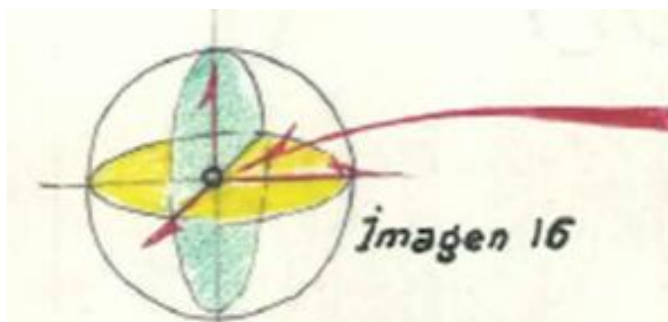


FIGURE 44: REPRESENTATION OF AN IBOZOO UU-FAISCEAU OF ORTHOGONAL AXES WHICH CANNOT BREAK UP

are composed of a FAISCEAU OF ORTHOGONAL AXES WHICH CANNOT BREAK UP. This is very difficult to understand if you continue to keep the classical mental image of the Euclidean SPACE with its grid of points and lines (see FIGURE 44).

Of course if the IBOZOO UU was like a sphere or hypersphere (S59-f17), within it the different axes could intersect at one point (e.g. the vector rays would intersect at the center). Such a mathematical model does NOT REALLY represent the IBOZOO UU.

If we have chosen the model of a sphere in our description, it is only to obtain a more faithful translation of the concepts by using algorithms, mathematical notations and geometrical concepts very familiar to terrestrials. (This is a bit like what we do when, for simplicity, we consider the Globe of the Earth as an ideal sphere while knowing that it is an ellipsoid (deformed) of revolution. (Isosceles ellipsoid with three axes)).

Let us suppose a SPHERE (S59-f17) which would constitute one of the infinite hyperplanes, meridian of a HYPERSPHERE of order  $N = 4$ . (If you are not familiar with this concept, imagine that if we give the name of meridian plane to the section of a sphere which passes through its center, i.e. the sphere of order  $N = 3$ , for a HYPERSPHERE of dimensions 4, its section will be precisely a figure of  $N-1$  dimensions, i.e. a sphere).

Thus, we must remember the notion of ANGLE in a HYPERSPHERE.

$\Theta = \Theta(P,Q)$  where  $P$  and  $Q$  are two HYPERPLANS defined by the coordinates  $U=(U_0 U_1 U_2 \dots U_n)$  and  $V=(V_0 V_1 V_2 \dots V_n)$

These two HYPERPLANS determine a beam  $\Gamma$ . Thus, in this bundle  $\Gamma$ , there are two HYPERPLANS  $P^\infty$  and  $Q^\infty$  that are tangent to the fundamental quadric  $\Sigma$ .

The angle  $\Theta=\Theta(P,Q)$  (where  $0 \leq \Theta \leq \pi$ ) between these two HYPERPLANS  $P$  and  $Q$ , is defined by:  $\Theta=\Theta(P,Q)=1/2i \text{Log } R(P,Q,P^\infty,Q^\infty)$ .

This angle is defined by the equations (27),(28),(30). (we cannot represent  $\Theta$  on an image. We only reproduce the  $\Theta_p$  projection of  $\Theta$ .  $\Theta_p$  will be expressed by two meridian planes in the case of  $\Theta$  for an  $N$ -space of order  $N=4$ ).

In those where  $\epsilon=+1$  we assume a HYPERSPHERE of positive curvature (case of the fictitious IBOZOO UU model).

Let us remember the difference between a SPHERE of positive curvature (picture 17) and a spherical surface of negative curvature (picture 18) which help us to understand the concepts of HYPERSPHERE of curvature  $\epsilon=+1$  (sphere) and  $\epsilon=-1$  (horse seal shape) (see FIGURE 45).



So: when  $R(P, Q, P', Q') = -1$  we consider that the two HYPERPLANS are orthogonal (in this case, we have  $\Theta = (1/2) \cdot \exp(i\pi/2)$ ).

We have the relation (27) and (28):

$$\sin^2(\Theta) = \epsilon \cdot (1 - \cos^2(\Theta)) \quad (27)$$

$$\cos(\Theta) = \frac{\epsilon \left( \frac{U_0 V_0}{\lambda^2} + U_1 V_1 + U_2 V_2 + \dots + U_n V_n \right)}{\sqrt{\left( \frac{U_0^2}{\lambda^2} + U_1^2 + \dots + U_n^2 \right) \cdot \left( \frac{V_0^2}{\lambda^2} + V_1^2 + \dots + V_n^2 \right)}}, \quad \lambda \in \mathbb{R}, \lambda \neq 0, i\lambda \in i\mathbb{R} \quad (28)$$

Developing (27) using (28), we have the numerator of the fraction  $1 - \cos^2(\Theta)$  equal to  $\left( \frac{U_0^2}{\lambda^2} + U_1^2 + \dots + U_n^2 \right) \cdot \left( \frac{V_0^2}{\lambda^2} + V_1^2 + \dots + V_n^2 \right) - \left( \frac{U_0 V_0}{\lambda^2} + U_1 V_1 + U_2 V_2 + \dots + U_n V_n \right)^2$  (with  $\epsilon^2 = 1$ )

$$= \frac{1}{\lambda^2} (U_0^2 V_1^2 + U_0^2 V_2^2 + \dots + U_0^2 V_n^2 + V_0^2 U_1^2 + V_0^2 U_2^2 + \dots + V_0^2 U_n^2) - 2 \frac{U_0 V_0}{\lambda^2} \sum_{i=1}^n U_i V_i + \sum_{i,j=1}^n U_i^2 V_j^2 - 2 \sum_{i<j} U_i V_i U_j V_j$$

$$= \frac{1}{\lambda^2} \sum_{i=1}^n ((U_0 V_i)^2 + (V_0 U_i)^2 - 2U_0 V_0 U_i V_i) + \sum_{i,j=1}^n U_i^2 V_j^2 - 2 \sum_{i<j} U_i V_i U_j V_j$$

$$= \frac{1}{\lambda^2} \sum_{i=1}^n \begin{vmatrix} U_0 & U_i \\ V_0 & V_i \end{vmatrix}^2 + \sum_{i,j=1}^n U_i^2 V_j^2 - 2 \sum_{i<j} U_i V_i U_j V_j$$

$$\text{But, } \sum_{i,j=1}^n \begin{vmatrix} U_i & U_j \\ V_i & V_j \end{vmatrix}^2 = \sum_{i,j=1}^n (U_i^2 V_j^2 + U_j^2 V_i^2 - 2U_i V_i U_j V_j)$$

$$= 2 \left( \sum_{i,j=1}^n U_i^2 V_j^2 - 2 \sum_{i<j} U_i V_i U_j V_j \right)$$

$$\text{Then, } 1 - \cos^2(\Theta) = \frac{\frac{1}{\lambda^2} \sum_{i=1}^n \begin{vmatrix} U_0 & U_i \\ V_0 & V_i \end{vmatrix}^2 + \frac{1}{2} \sum_{i,j=1}^n \begin{vmatrix} U_i & U_j \\ V_i & V_j \end{vmatrix}^2}{\left( \frac{U_0^2}{\lambda^2} + U_1^2 + \dots + U_n^2 \right) \cdot \left( \frac{V_0^2}{\lambda^2} + V_1^2 + \dots + V_n^2 \right)}$$

and we find the sine formula (29):

$$\sin(\Theta) = \sqrt{\epsilon \cdot \frac{\frac{1}{\lambda^2} \sum_{i=1}^n \begin{vmatrix} U_0 & U_i \\ V_0 & V_i \end{vmatrix}^2 + \frac{1}{2} \sum_{i,j=1}^n \begin{vmatrix} U_i & U_j \\ V_i & V_j \end{vmatrix}^2}{\left( \frac{U_0^2}{\lambda^2} + U_1^2 + \dots + U_n^2 \right) \cdot \left( \frac{V_0^2}{\lambda^2} + V_1^2 + \dots + V_n^2 \right)}} \quad (29)$$

If you replace the concept of OOAWOO (VECTOR RAYON) from our earlier, more simplistic model, with that of HYPERPLAN of order  $N=4$  and if you assume these reference HYPERPLANS not in the own IBOZOO UU under study, but in another one related to it, we can imagine three directing cosines which we will call  $\text{COS}\Psi$ ,  $\text{COS}\Xi$ ,  $\text{COS}\Omega$ . We will define as many other angles  $(\Psi, \Xi, \Omega)$  that we define as IOAWOO (DIMENSIONAL ANGLES). The angles will each define the respective values of the three-dimensional space as we conceive it. It is assumed that an infinitesimal variation in the value of these director cosines implies a related pair of IBOZOO UU.

Once arrived at this point, we will use for the terrestrial brothers not very competent in mathematics an educational image of a WAAM (UNIVERSE) represented by a huge "swarm of dragonflies".

You can assume that these insects are multichromatic. We can also see that there is not a single pair that has the same color tones. We can see them twirling in such a way that we will never know where one is at any given moment because they are here and everywhere at the same time. They are green, magenta, orange, blue, gold, etc. all mixed together.

Now let us suppose that we have an organ of vision so acute and special that at a glance we can locate the millions of dragonflies of a single color (green for example) and that furthermore our

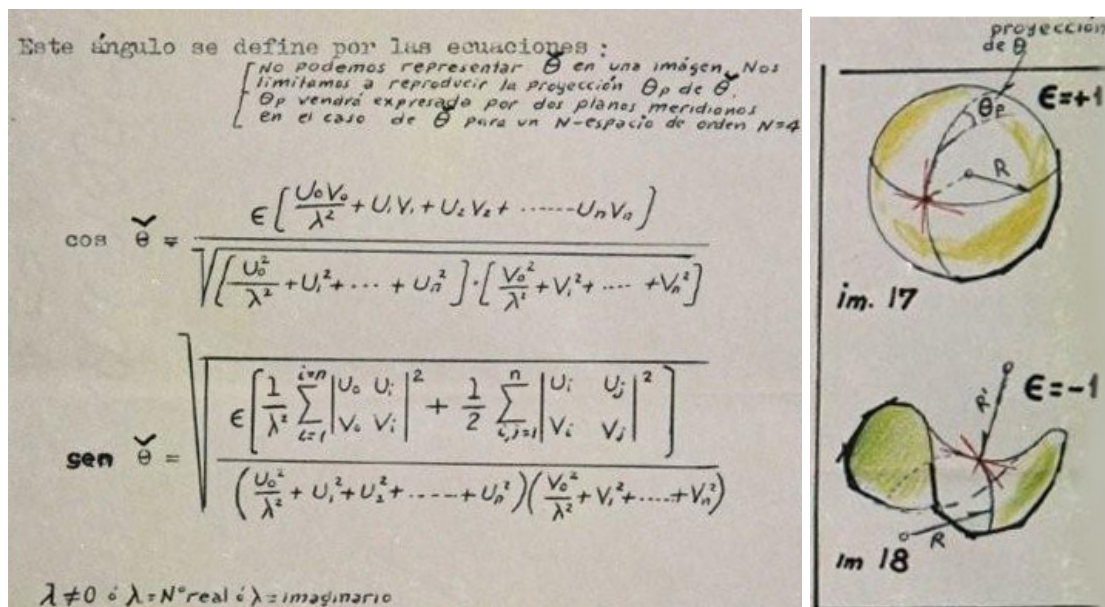


FIGURE 45: formula of the cosine and sine of the angle of two hyperplanes with a hypersphere of positive ( $\epsilon=+1$ ) or negative curvature ( $\epsilon=-1$ )

brain is so developed that it is able to order them by nuance, from the light green to the less luminous... But it is here that the brain makes us make a bad judgment. Instead of perceiving an orderly pleiad of insects forming a rich range of green tones, we would contemplate a cold and abstract straight line: the pair of light green dragonflies, more luminous, acquires for our brain the prosaic character of the closest extremity of this very long straight line. The pair of greenish-blue dragonflies will be represented as the limit and distant point of this immense line (image 21).

To understand our PHYSICAL WAAM Model, earthlings must perfect other mental images that have become topical for them since childhood. You must study other plurivalent forms of mathematical Logic. You must also understand that this image of a Physical World composed of atoms, themselves composed of a multitude of atomic subparticles occupying at each moment probabilistic positions, is an insufficient and shallow TRUTH; you must reject this absurd mental image consisting in saying that a particle moving at an instantaneous speed V is the material passage of this same particle from a POINT P to another adjacent P', distant from it by an infinitesimal distance, in an elementary time interval dt. This is in order to leave room for the real concept of speed which implies various rotations in two linked IBOZOO UU, rotations by which the first IBOZOO UU of the pair, by inverting its axes, ceases to present itself in the form of a subatomic particle, while the second one orients its OAWOO (AXES, VECTOR RAYONS) to transform itself into a subparticle (as you call it) identical to the previous one: an illusory effect of translation is thus produced, a bit like if two earthly magicians separated by ten meters on a stage, operated by putting (one of the two) a marked rabbit in the pocket, a rabbit which would be taken out by his companion a few moments later. Any intelligent person will easily understand that the rabbit did not travel in the air and that they are two identical rabbits.

We are surprised to observe that after having exhaustively studied Wave Mechanics and observed

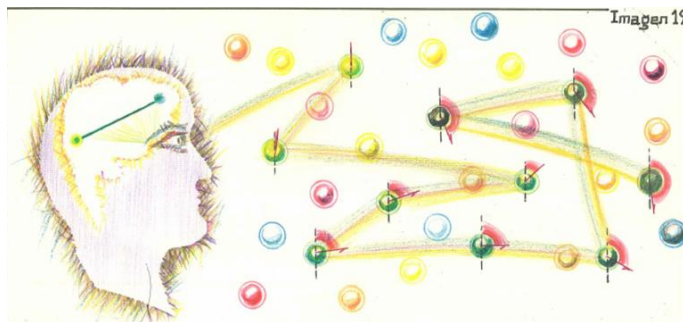


FIGURE 46: classification of the IBOZOO UU in an ordered scale according to their angular size in relation to one of them by neurencephalon of an OEMI (person)

that all time function phenomena can be reduced in the end to a series of sinusoidal functions, that is to say CYCLICAL, the Earth Physicists have not sensed an angular WAAM (universe), clinging as they are to the rigid scalar mathematical model postulated by Euclid and his successors.

But a correction of these concepts at the present time would hardly be positive for you. It is much better that the physicists of the Earth discover the truth more slowly, allowing time for spiritual values to take over the aggressive instincts of certain economic oligarchies that rule in some countries.

In image 19 (FIGURE 46) you can see in a symbolic way how the neurencephalon carries out a synthesis work classifying the IBOZOO UU in an ordered scale according to their angular size in relation to one of them taken as reference.

When the OEMII looks in a given direction, its visual field includes all the IBOZOO UU whose OAWOO are oriented with different angles in a Field that you could symbolize mathematically by a HYPERPLAN.

This simplistic image is intended for OEMIIs with little mathematical knowledge.

The initiated will understand that the IBOZOO UU are not located at defined points nor are the terms DISORDER or ENTROPY appropriate for this model. If the green spheres symbolize a view in a certain direction, the blue, red ones would represent as many other visual rays directed, for the human eye, in different orientations. To say that the IBOZOO UU are like small spheres or that "between them there is a void" or that they are tangent to each other within a dense space filled with IBOZOO UU, all this does not make sense. Such mental images are the ones that appear to a UUGEEYIE (child) when he is told for the first time on UMMO about the conception of the SPACE composed by IBOZOO UU.

His infantile mentality, accustomed to familiar perceptions, tends to materialize this concept of IBOZOO UU and to assign it a physicality.

He thus imagines the WAAM as a huge UYAAAYAA spawn (a species of arthropod that drags a large pouch full of its small transparent eggs).

In the image 19 (FIGURE 46) you can see how the image of a segment of a straight line appears in the field of consciousness, a coded translation of the stimuli that reach the retina.

Such a stimulus is transformed into the mental image of DISTANCE when, between the eye of the observer and the body contemplated, there is no matter.

In the case of negative curvature hypersphere ( $\epsilon=-1$ ), formulas (27), (28) and (29) lead us to

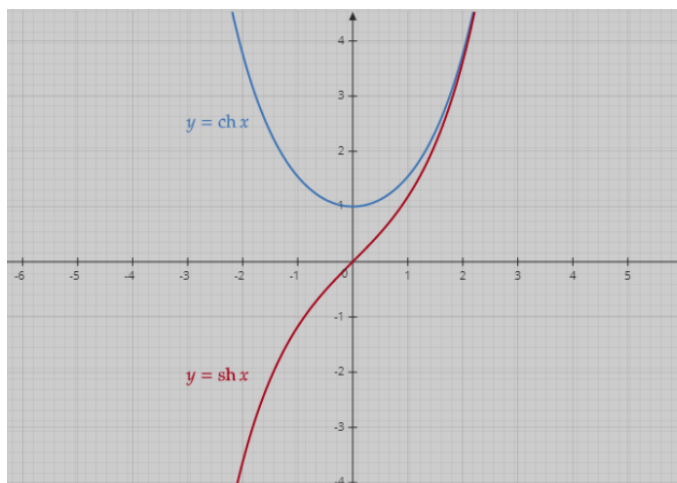


FIGURE 47: GRAPHICAL REPRESENTATIONS of COSH and SINH

consider the hyperbolic cosine (cosh) and hyperbolic sine (sinh) functions instead of cos and sin.  
 Definition of the hyperbolic cosine

The hyperbolic cosine function, denoted ch and defined on  $\mathbb{R}$ , is the even part of the exponential function of base e:

$$\forall x \in \mathbb{R} \quad \text{ch}(x) = \frac{e^x + e^{-x}}{2}$$

The hyperbolic cosine function can also be noted cosh.

Definition of the hyperbolic sine

The hyperbolic sine function, denoted sh and defined on  $\mathbb{R}$ , is the odd part of the exponential function with base e :  $\forall x \in \mathbb{R} \quad \text{sh}(x) = \frac{e^x - e^{-x}}{2}$

The hyperbolic sine function can also be noted sinh.

Derivatives of the cosine and hyperbolic sine functions

The cosine and hyperbolic sine functions are therefore derivable on  $\mathbb{R}$  and :

$$\forall x \in \mathbb{R} \quad \text{ch}'(x) = \text{sh}(x)$$

$$\forall x \in \mathbb{R} \quad \text{sh}'(x) = \text{ch}(x)$$

Let us solve  $e^x - e^{-x} > 0$

Now  $\ln$  being strictly increasing on  $\mathbb{R}$ , we obtain :  $x > -x$

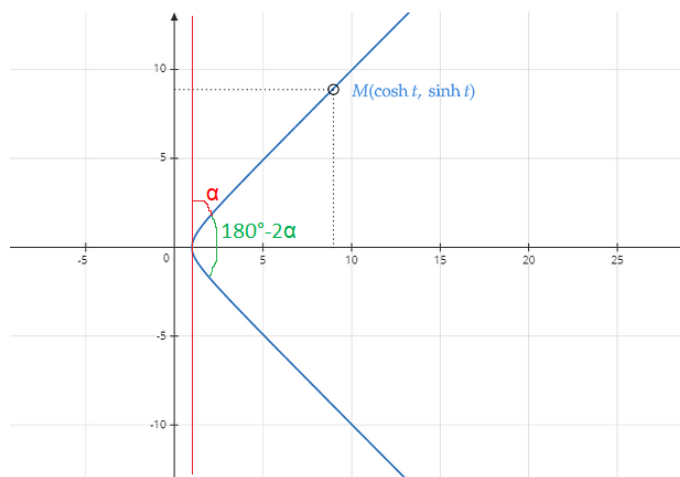
Thus  $e^x - e^{-x} > 0 \iff x > 0$

So we have that:

ch is strictly decreasing on  $]-\infty; 0]$  and is strictly increasing on  $[0; +\infty[$  and sh is strictly increasing on  $\mathbb{R}$ . So as  $\text{ch}(0)=1, \forall x \in \mathbb{R}, \text{ch}(x) \geq 1$ .

Representative curves

The graphical representations of the cosine and hyperbolic sine functions are given FIGURE 47.

FIGURE 48: CURVE OF POINTS  $M(\text{cht}, \text{sht})$ , EQUILATERAL HALF HYPERBOLA

Hyperbolic trigonometry As :

$$\text{ch}(x) + \text{sh}(x) = e^x$$

$$\text{ch}(x) - \text{sh}(x) = e^{-x}$$

Then:  $\forall x \in \mathbb{R} \quad \text{ch}^2(x) - \text{sh}^2(x) = 1$  (relation (27) with  $\epsilon = -1$ ).

Let us seek to have a graphical representation of the points  $M(t)$  of coordinates  $(\text{cht}, \text{sht})$  in a plane provided with an orthonormal reference frame.

Let  $X = \text{cht}$  and  $Y = \text{sht}$ , so :

$$Y^2 = X^2 - 1 \text{ and } X \geq 0$$

So the set of points  $M(\text{cht}, \text{sht})$  is represented by the two curves  $y = \sqrt{x^2 - 1}$  and  $y = -\sqrt{x^2 - 1}$  for  $x \geq 1$ .

In a plane with an orthonormal reference frame, the points  $M(\text{cht}, \text{sht})$  thus describe an equilateral half-hyperbola (see FIGURE 48). The two branches (IBOZOO UU) of the hyperbola form an angle  $\alpha$  with the vertical axis (REFERENCE IBOZOO UU). Here the angle is equal to  $45^\circ$  because the hyperbola is equilateral. There is an analogy between this angle  $\alpha$  and the angle formed by two wings of a dragonfly, we can make this association between FIGURE 37 and FIGURE 48. And so the angle  $180^\circ - 2\alpha$  (in GREEN) between two branches of the hyperbola corresponds to the angle formed by two wings of the dragonfly.

Remember this: "the universe is a swarm of dragonflies whose wings (IBOZOO UU axes) form angles in GREEN (see FIGURE 37).

This suggests that we can characterize a hyperbola (and thus a hyperboloid) with an angle formed by two IBOZOO UUs, which is not the case for a circle or a sphere of positive curvature ( $\epsilon = +1$ ) or any plane.

Moreover  $\forall x \in \mathbb{R}$ ,  $\text{ch}(x) = \cos(ix)$  and  $\cos(x) = \frac{e^{ix} + e^{-ix}}{2}$ ,  $\text{sh}(x) = -i\sin(ix)$  and  $\sin(x) = \frac{e^{ix} - e^{-ix}}{2i}$ . Using this last equality, and replacing the sine function by the hyperbolic sine function in (29) with  $\sqrt{\epsilon} = i$  we have (29A) and (29B):

$$\sin(i\Theta) = \frac{e^{-\Theta} - e^{\Theta}}{2i} = -\sqrt{\frac{\frac{1}{\lambda^2} \sum_{i=1}^n \left| \begin{array}{cc} U_0 & U_i \\ V_0 & V_i \end{array} \right|^2 + \frac{1}{2} \sum_{i,j=1}^n \left| \begin{array}{cc} U_i & U_j \\ V_i & V_j \end{array} \right|^2}{(\frac{U_0^2}{\lambda^2} + U_1^2 + \dots + U_n^2) \cdot (\frac{V_0^2}{\lambda^2} + V_1^2 + \dots + V_n^2)}} \quad (29A)$$

$$\text{sh}(\Theta) = i \sqrt{\frac{\frac{1}{\lambda^2} \sum_{i=1}^n \left| \begin{array}{cc} U_0 & U_i \\ V_0 & V_i \end{array} \right|^2 + \frac{1}{2} \sum_{i,j=1}^n \left| \begin{array}{cc} U_i & U_j \\ V_i & V_j \end{array} \right|^2}{(\frac{U_0^2}{\lambda^2} + U_1^2 + \dots + U_n^2) \cdot (\frac{V_0^2}{\lambda^2} + V_1^2 + \dots + V_n^2)}} \quad (29B)$$

Since sh and ch are real-valued functions,  $i \sqrt{\frac{\frac{1}{\lambda^2} \sum_{i=1}^n \left| \begin{array}{cc} U_0 & U_i \\ V_0 & V_i \end{array} \right|^2 + \frac{1}{2} \sum_{i,j=1}^n \left| \begin{array}{cc} U_i & U_j \\ V_i & V_j \end{array} \right|^2}{(\frac{U_0^2}{\lambda^2} + U_1^2 + \dots + U_n^2) \cdot (\frac{V_0^2}{\lambda^2} + V_1^2 + \dots + V_n^2)}}$  is a real number

and therefore  $\sqrt{\frac{\frac{1}{\lambda^2} \sum_{i=1}^n \left| \begin{array}{cc} U_0 & U_i \\ V_0 & V_i \end{array} \right|^2 + \frac{1}{2} \sum_{i,j=1}^n \left| \begin{array}{cc} U_i & U_j \\ V_i & V_j \end{array} \right|^2}{(\frac{U_0^2}{\lambda^2} + U_1^2 + \dots + U_n^2) \cdot (\frac{V_0^2}{\lambda^2} + V_1^2 + \dots + V_n^2)}}$  is a pure imaginary complex number. When the Ummites specify "with  $\lambda$  real number and  $i\lambda$  imaginary", one can see a remark which serves to confuse the reader.

The reciprocal bijection Argsh of sh is a strictly increasing function of  $\mathbb{R}$  in  $\mathbb{R}$  defined by:  $\forall x \in \mathbb{R}$ ,  $\text{Argsh}(x) = \ln(x + \sqrt{1 + x^2})$  (where  $\ln$  is the neperian logarithm). It is a non-periodic function which is "often" encountered in integral calculus in the search for primitives. Its derivative function is defined by  $\text{Argsh}'(x) = \frac{1}{\sqrt{1+x^2}}$ . The graph of the reciprocal functions sh and Argsh is shown in FIGURE 49. And so we can define  $\Theta$  by applying Argsh to the relation (29B) which becomes (30):

$$\Theta = \ln \left( i \sqrt{\frac{\frac{1}{\lambda^2} \sum_{i=1}^n \left| \begin{array}{cc} U_0 & U_i \\ V_0 & V_i \end{array} \right|^2 + \frac{1}{2} \sum_{i,j=1}^n \left| \begin{array}{cc} U_i & U_j \\ V_i & V_j \end{array} \right|^2}{(\frac{U_0^2}{\lambda^2} + U_1^2 + \dots + U_n^2) \cdot (\frac{V_0^2}{\lambda^2} + V_1^2 + \dots + V_n^2)}} + \sqrt{1 - \frac{\frac{1}{\lambda^2} \sum_{i=1}^n \left| \begin{array}{cc} U_0 & U_i \\ V_0 & V_i \end{array} \right|^2 + \frac{1}{2} \sum_{i,j=1}^n \left| \begin{array}{cc} U_i & U_j \\ V_i & V_j \end{array} \right|^2}{(\frac{U_0^2}{\lambda^2} + U_1^2 + \dots + U_n^2) \cdot (\frac{V_0^2}{\lambda^2} + V_1^2 + \dots + V_n^2)}}} \right) \quad (30)$$

where  $\frac{\frac{1}{\lambda^2} \sum_{i=1}^n \left| \begin{array}{cc} U_0 & U_i \\ V_0 & V_i \end{array} \right|^2 + \frac{1}{2} \sum_{i,j=1}^n \left| \begin{array}{cc} U_i & U_j \\ V_i & V_j \end{array} \right|^2}{(\frac{U_0^2}{\lambda^2} + U_1^2 + \dots + U_n^2) \cdot (\frac{V_0^2}{\lambda^2} + V_1^2 + \dots + V_n^2)} = 1 - \text{ch}^2(\Theta) \leq 0$ , so its square root is an imaginary number and by multiplying by  $i$ , we have a positive real number, and finally

$$\sqrt{1 - \frac{\frac{1}{\lambda^2} \sum_{i=1}^n \left| \begin{array}{cc} U_0 & U_i \\ V_0 & V_i \end{array} \right|^2 + \frac{1}{2} \sum_{i,j=1}^n \left| \begin{array}{cc} U_i & U_j \\ V_i & V_j \end{array} \right|^2}{(\frac{U_0^2}{\lambda^2} + U_1^2 + \dots + U_n^2) \cdot (\frac{V_0^2}{\lambda^2} + V_1^2 + \dots + V_n^2)}}} = |\text{ch}(\Theta)| \geq 1.$$

To conclude, with  $i = \sqrt{-1}$ , we have the explicit formula (31) of  $\Theta$ :

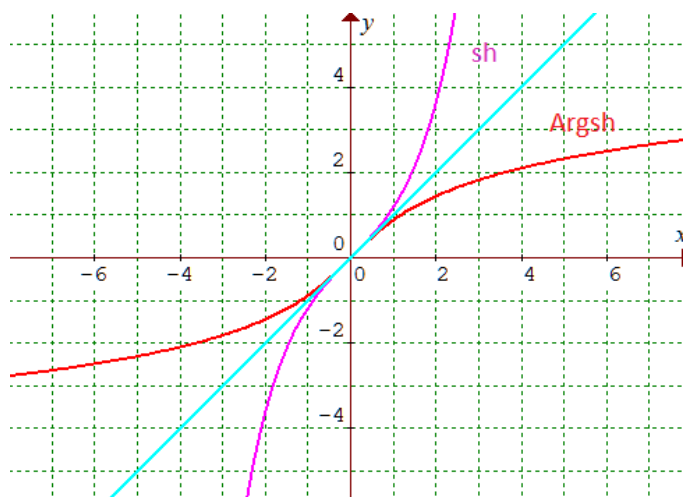


FIGURE 49: In purple: the hyperbolic sine function, in red: its reciprocal Argsh

$$\Theta = \ln \left( \sqrt{-\frac{\frac{1}{\lambda^2} \sum_{i=1}^n \begin{vmatrix} U_0 & U_i \\ V_0 & V_i \end{vmatrix}^2 + \frac{1}{2} \sum_{i,j=1}^n \begin{vmatrix} U_i & U_j \\ V_i & V_j \end{vmatrix}^2}{(\frac{U_0^2}{\lambda^2} + U_1^2 + \dots + U_n^2) \cdot (\frac{V_0^2}{\lambda^2} + V_1^2 + \dots + V_n^2)}} + \sqrt{1 - \frac{\frac{1}{\lambda^2} \sum_{i=1}^n \begin{vmatrix} U_0 & U_i \\ V_0 & V_i \end{vmatrix}^2 + \frac{1}{2} \sum_{i,j=1}^n \begin{vmatrix} U_i & U_j \\ V_i & V_j \end{vmatrix}^2}{(\frac{U_0^2}{\lambda^2} + U_1^2 + \dots + U_n^2) \cdot (\frac{V_0^2}{\lambda^2} + V_1^2 + \dots + V_n^2)}}} \right) \quad (31)$$

We notice that  $\Theta \geq \ln(1) = 0$ . We have deepened the Ummite formulas in the case of a hypersphere of negative curvature.

In the case of a hypersphere of positive curvature ( $\epsilon=+1$ ), the formula is given by (32):

$$\Theta = \text{Arctan} \left( \frac{\sqrt{\frac{1}{\lambda^2} \sum_{i=1}^n \begin{vmatrix} U_0 & U_i \\ V_0 & V_i \end{vmatrix}^2 + \frac{1}{2} \sum_{i,j=1}^n \begin{vmatrix} U_i & U_j \\ V_i & V_j \end{vmatrix}^2}}{\frac{U_0 V_0}{\lambda^2} + U_1 V_1 + U_2 V_2 + \dots + U_n V_n} \right) \quad (32)$$

The Arctan function being the reciprocal bijection of the tangent function, it is defined on  $\mathbb{R}$ , and strictly increasing and with value in the interval  $]-\frac{\pi}{2}; \frac{\pi}{2}[$ . Thus the angle  $\Theta \in ]-\frac{\pi}{2}; \frac{\pi}{2}[$ .

Now, we will approach Einstein's field equation and involve the twin universe of negative mass in order to find solutions more consistent with the observable and in particular that explain the shape of some galaxies as suggested by the Ummites.

The Einstein equation is the fundamental equation of general relativity. It consists of a tensor equation. It represents a set of differential equations with highly nonlinear partial derivatives of the second order.

Its eponym is Albert Einstein (1879-1955) who presented it, for the first time, on Thursday 25 November 1915 at the Royal Prussian Academy of Sciences in Berlin. The Academy published Einstein's paper the following Thursday, December 2, in its Proceedings.

Einstein generalized the equation by adding a term, called the cosmological constant, which appeared for the first time in a paper submitted on February 8, 1917 and published on the 15th of the same month.

Mathematical form of the Einstein field equation The Einstein field equation is usually written in the following way (33):

$$R_{\mu\nu} - \frac{1}{2}g_{\mu\nu}R + \Lambda g_{\mu\nu} = \chi T_{\mu\nu} \quad (33)$$

where  $R_{\mu\nu}$  is the Ricci tensor (dimension  $L^{-2}$ ) which can be considered as the Laplacian of the Riemannian metric tensor  $g$  in the case of Riemannian varieties. This deformation of the space-time generated by the gravitational force is expressed with the Ricci tensor.;  $R$  is the scalar curvature which is defined as the trace of the Ricci tensor relative to the metric  $g$ :  $R = Tr_g(R_{\mu\nu})$  ( $L^{-2}$  dimension);  $g_{\mu\nu}$  is the metric tensor of signature  $(+,-,-,-)$  (dimensionless);  $\Lambda$  is the cosmological constant (dimension  $L^{-2}$ );  $T_{\mu\nu}$  is the energy-impulse tensor (energy/volume dimension);  $\chi$  is a dimensioned coupling constant called the Einstein gravitational coupling constant or, more simply, the Einstein gravitational constant or even the Einstein constant:  $\chi = \frac{8\pi G}{c^4}$  (it is  $\approx 2.0766 \cdot 10^{-43} \text{ m}\cdot\text{J}^{-1}$ , in the International System of units), with:  $\pi$ , the number  $\pi$  (half the circumference of the unit circle);  $G$ , the gravitational constant (about  $6.6742 \cdot 10^{-11} \text{ m}^3\text{kg}^{-1}\text{s}^{-2}$ );  $c$ , the celerity constant, equal to the speed of light in vacuum (exactly  $299\,792\,458 \text{ m}\cdot\text{s}^{-1}$ ). If the dimension of the metric tensor  $g_{\mu\nu}$  is that of the square of a length  $L^2$ , then the dimension of the constant  $\chi$  is  $M^{-1}L^{-1}T^2$  and its value is  $\chi = 8\frac{\pi G}{c^4}$ . But, if the dimension of the metric tensor  $g_{\mu\nu}$  is that of the square of a time  $T^2$ , then the dimension of the constant  $\chi$  is  $M^{-1}L$  and its value is  $\chi = 8\frac{\pi G}{c^2}$ . We will use the latter formula for the Einstein constant (see relation 21). The Einstein equation is an equation in the space of symmetric (covariant) tensors of degree 2 on a variety of dimension 4. It can therefore be expressed using  $(4*5)/2 = 10$  scalar equations once a local coordinate system has been chosen. On the other hand, the first Bianchi identity, which is an equation in the space of vector-valued forms, can be expressed using 4 scalar equations in this same system. The Einstein equation thus has  $10 - 4 = 6$  independent equations.

The Einstein field equation is understood as an equation allowing to know the metric tensor  $g_{\mu\nu}$  given a distribution of matter and energy expressed as an energy-impulse tensor. Despite its simple appearance, it is actually quite complex, especially since the Ricci tensor and the scalar curvature depend on the metric.

$\Lambda$ , the cosmological constant, was introduced by Einstein to allow for static solutions to the cosmological model derived from the Einstein equation. He later called this introduction "the biggest mistake of his life".

By defining the Einstein tensor  $G_{\mu\nu} = R_{\mu\nu} - \frac{1}{2}Rg_{\mu\nu}$  which is a symmetric rank-2 metric-dependent tensor, and if we consider that  $\Lambda=0$  (which Einstein eventually admitted, but which is controversial today), it is possible to write this relation in a more compact way  $G_{\mu\nu} = \frac{8\pi G}{c^2}T_{\mu\nu}$ . Working in the geometric unit system, where  $G=c=1$ , we have  $G_{\mu\nu} = 8\pi T_{\mu\nu}$ .

The left part represents the curvature of space-time as determined by the metric and the right expression represents the mass/energy content of space-time. This equation can then be interpreted as a set of equations describing how the curvature of spacetime is related to the mass/energy content of the universe.



These equations, together with the geodesic equation, form the core of the mathematical formulation of general relativity.

$R_{\mu\nu}$ ,  $g_{\mu\nu}$  and  $T_{\mu\nu}$  are 4x4 matrices, you can see for example equation (4) solution corresponding to a flat space-time (Minkowski space) and equations (2),(3) which are the two common forms of the metric of the solution around a spherical mass M (Schwarzschild metric). The equations (2), (3) and (4) correspond to the metric tensor  $g_{\mu\nu}$ .

In geometry, and more particularly in differential geometry, the metric tensor is a second-order tensor that defines the scalar product of two vectors at each point in a space, and is used to measure lengths and angles. It generalizes the Pythagorean theorem. In a given coordinate system, the metric tensor can be represented as a symmetric matrix, usually denoted so as not to confuse the matrix with the metric tensor. In what follows, the Einstein summation convention is used. The metric tensor of a finite dimensional vector space  $E$  is a rank 2 covariant tensor (i.e. a bilinear form) defined on  $E$  :

$$g : E \times E \longrightarrow \mathbb{R} \\ (u, v) \longrightarrow g(u, v)$$

$g$  is:

symmetrical:  $\forall u, v \in E \times E \quad g(v, u) = g(u, v)$ ;

non-degenerate:  $\forall u \in E, [\forall v \in E, g(u, v) = 0] \Rightarrow u = 0$

positive:  $\forall u \in E, g(u, u) \geq 0$

More generally, the metric tensor of a differential variety is the data, at each point of the variety, of a metric tensor on the space tangent to the variety at this point. The attribution of a metric tensor to this variety makes it a Riemannian variety.

The scalar product of two vectors  $u^i e_i$  and  $v^j e_j$  where  $i=1, \dots, n$  as follows:

$g(u, v) = g(u^i e_i, v^j e_j) = u^i v^j g_{ij}$ . The notation  $g_{ij}$  is conventionally used for the components of the metric tensor. In special relativity, then in general relativity, the metric tensor is noted, by convention  $g_{\mu\nu}$  where  $\mu$  and  $\nu$  are elements of the set  $\{0, 1, 2, 3\}$ .

In the dual space of  $E$ , the metric conjugate to that of  $E$ , denoted  $g^{\mu\nu}$  and called the dual metric or inverse metric (the matrix representing its components being the inverse of the one representing the components of the metric of  $E$ ), is a contravariant tensor. It respects the identity  $g^{\mu\nu} g_{\nu\rho} = \delta^\mu_\rho$  which allows to transform contravariant components into covariant components and vice versa.

In a curvilinear coordinate system (e.g. spherical coordinates), the metric tensor  $g$  can be seen as an "infinitesimal scalar product" between two points P1  $(x_1^0, x_1^1, x_1^2, x_1^3)$  and P2  $(x_2^0, x_2^1, x_2^2, x_2^3)$  which are infinitesimally close, and  $s^2$  is the distance between P1 and P2 squared. In the case of a flat space, it is the Minkowski metric (see equation (4) for  $g_{\mu\nu}$  and Minkowski space on FIGURE 3).

A Minkowski space frame of reference is a Galilean frame of reference for an observer: choice of a place and time of reference, choice of three-dimensional axes and time. An observer, and his frame of reference, being immersed in this space, locates an event (point of space-time) by its temporal ( $t$ ) and spatial coordinates  $(x; y; z)$  : a point M is noted  $M(ct; x; y; z)$  or  $M(x^0, x^1, x^2, x^3)$  with  $x^0 = ct$ ,  $x^1 = x$ ,  $x^2 = y$ ,  $x^3 = z$  which gives  $ds^2 = -c^2 dt^2 + dx^2 + dy^2 + dz^2$ . But, for nonlinear solutions of general relativity the space is curved and this distance corresponds to an arc. We then adopt the following writing:  $ds^2 = g_{\mu\nu} dx^\mu dx^\nu$  where  $s$  is the length of the infinitesimal arc between P1 and P2. The length of a segment of a curve parametrized by  $t$ , starting from point a at  $t_1$  and arriving at point b at  $t_2$  is defined by  $L = \int_a^b \sqrt{ds^2} = \int_a^b \sqrt{g_{\mu\nu} dx^\mu dx^\nu} = \int_{t_1}^{t_2} \sqrt{g_{\mu\nu} \frac{dx^\mu}{dt} \frac{dx^\nu}{dt}} dt$  where  $(x^0(t), x^1(t), x^2(t), x^3(t))$  is the equation describing this curve in the local coordinate

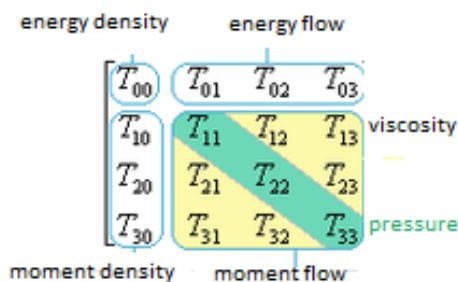


FIGURE 50: The components of the energy-impulse tensor

system. The angle  $\theta$  between two vectors  $u$  and  $v$  tangent at the same point is defined by  $\cos(\theta) = \frac{g_{\mu\nu}u^\mu v^\nu}{\sqrt{g_{\mu\nu}u^\mu u^\nu} \sqrt{g_{\mu\nu}v^\mu v^\nu}}$ .

Knowing the metric tensor also allows us to determine the geodesics (see FIGURE 33) of the space on which this tensor is defined. For the Schwarzschild metric  $(x^0, x^1, x^2, x^3) = (ct, r, \theta, \phi)$ .

The energy-impulse tensor can be written as a symmetric real  $4 \times 4$  matrix with metric values which derive from the flux of the quadri-moment (impulse-energy quadrivector) through surfaces

of constant  $x^\nu$  coordinate:  $T_{\mu\nu} = \begin{pmatrix} T_{00} & T_{01} & T_{02} & T_{03} \\ T_{10} & T_{11} & T_{12} & T_{13} \\ T_{20} & T_{21} & T_{22} & T_{23} \\ T_{30} & T_{31} & T_{32} & T_{33} \end{pmatrix}$  where  $T_{00}$  is the energy density.  $T_{00}$  is

positive;  $T_{0i}$  is the energy flux through the unit area following  $i$ ;  $T_{i0}$  is the density of the  $i^{th}$  impulse component. By symmetry,  $\{T_{01}, T_{02}, T_{03}\} = \{T_{10}, T_{20}, T_{30}\}$  and are therefore also moment densities.

The  $3 \times 3$  submatrix of the spatial components:  $\begin{pmatrix} T_{11} & T_{12} & T_{13} \\ T_{21} & T_{22} & T_{23} \\ T_{31} & T_{32} & T_{33} \end{pmatrix}$  is the moment flux matrix. In

fluid mechanics, its diagonal corresponds to the pressure, and the other components correspond to the tangential forces due to viscosity.

For a theory described by a Lagrangian density  $\mathcal{L}$  the action is written as an integral over the space-time:  $\mathcal{S} = \int d^4x \sqrt{g} \mathcal{L}$  where  $g = |\det(g_{\mu\nu})|$  is the determinant of the space-time metric tensor. The associated energy-impulse tensor is defined by the variation of the action with respect to the inverse metric  $T_{\mu\nu} = \frac{1}{\sqrt{g}} \frac{\delta \mathcal{S}}{\delta g^{\mu\nu}}$ .

For a fluid at rest, the energy-impulse tensor reduces to the diagonal matrix  $\begin{pmatrix} \rho c^2 & 0 & 0 & 0 \\ 0 & -p & 0 & 0 \\ 0 & 0 & -p & 0 \\ 0 & 0 & 0 & -p \end{pmatrix}$

where  $\rho$  is the density and  $p$  the hydrostatic pressure.

We note  $T_{\mu\nu}^{(+)}$  the impulse-energy tensor in our universe of positive mass which corresponds to the positive matter/energy content of spacetime and  $T_{\mu\nu}^{(-)}$  the impulse-energy tensor in the twin universe of negative mass which corresponds to the negative matter/energy content of spacetime.

We thus note the metric tensors  $g_{\mu\nu}^{(+)}$  and  $g_{\mu\nu}^{(-)}$  corresponding respectively to the positive and negative mass metric tensors of each universe and we denote  $R_{\mu\nu}^{(+)}$  the Ricci tensor and its scalar curvature  $R^{(+)}$  built from the metric  $g_{\mu\nu}^{(+)}$ , similarly  $R_{\mu\nu}^{(-)}$  the Ricci tensor and its scalar curvature

$R^{(-)}$  built from the metric  $g_{\mu\nu}^{(-)}$ . The positive mass universe absorbs only positive mass particles and the twin universe absorbs only negative mass particles according to Newton's law. At the level of the border between the two universes, a positive mass  $M^+ > 0$  of constant density  $\rho^+ > 0$  can be "disturbed" by a negative mass  $M^- \leq 0$  of constant density  $\rho^- \leq 0$  which repel each other always according to the law of Newton  $F=G\frac{M^+M^-}{d^2}$  where  $d$  is the distance that separates them and  $G$  the gravitational constant previously given. In an analogous way, a positive mass  $M^+ \geq 0$  of constant density  $\rho^+ \geq 0$  can disturb a negative mass  $M^- < 0$  of constant density  $\rho^- < 0$  at the border. The mutual influence of the universe of positive mass on the other of negative mass and reciprocally generates the folds of space and is translated mathematically by the couple of equations (34) in the absence of cosmological constant  $\Lambda=0$ :

$$\begin{aligned} R_{\mu\nu}^{(+)} - \frac{1}{2}g_{\mu\nu}^{(+)} R^{(+)} &= \chi(T_{\mu\nu}^{(+)} - |T_{\mu\nu}^{(-)}|) \text{ "universe of classical matter"} \\ R_{\mu\nu}^{(-)} - \frac{1}{2}g_{\mu\nu}^{(-)} R^{(-)} &= \chi(T_{\mu\nu}^{(-)} + |T_{\mu\nu}^{(+)}|) \text{ "antimatter universe (twin)"} \end{aligned} \quad (34)$$

We can notice that if the coefficients  $T_{\mu\nu}^{(+)}$  are all positive and if the coefficients  $T_{\mu\nu}^{(-)}$  are all negative for the two space-time contents considered then it is the same difference of two terms suggested by the Ummites in the right part of the two equations:

$$\begin{aligned} \text{"universe of classical matter"} \\ R_{\mu\nu}^{(+)} - \frac{1}{2}g_{\mu\nu}^{(+)} R^{(+)} &= \chi(|T_{\mu\nu}^{(+)}| - |T_{\mu\nu}^{(-)}|) = \chi(T_{\mu\nu}^{(+)} - |T_{\mu\nu}^{(-)}|) \\ \text{"antimatter universe (twin)"} \\ R_{\mu\nu}^{(-)} - \frac{1}{2}g_{\mu\nu}^{(-)} R^{(-)} &= \chi(|T_{\mu\nu}^{(+)}| - |T_{\mu\nu}^{(-)}|) = \chi(T_{\mu\nu}^{(+)} - |T_{\mu\nu}^{(-)}|) \end{aligned} \quad (34A)$$

$|T_{\mu\nu}^{(-)}| = -T_{\mu\nu}^{(-)}$  does not have the same values in the two twin universes because in the twin universe of negative mass, it is dominant compared to  $|T_{\mu\nu}^{(+)}|$ , whereas it is the opposite in the universe of positive mass, it is the tensor  $|T_{\mu\nu}^{(+)}|$  which is dominant.

Now consider  $T_{\mu\nu}^{(+)}$  as the matter tensor present only in the positive mass universe, and the matter tensor  $T_{\mu\nu}^{(-)}$  present only in the negative mass universe, we will keep only a tiny proportion of each of them in the universe whose sign of the mass is opposite.

It is for this reason, that we keep only a proportion  $\delta_1$  of the tensor  $|T_{\mu\nu}^{(-)}|$  in the equation of Einstein for the universe of classical matter and we keep only a proportion  $\delta_2$  of the tensor  $T_{\mu\nu}^{(+)}$  in the equation of Einstein for the universe of antimatter universe (twin universe) where  $\delta_1$  and  $\delta_2$  are small between 0 and 1.

$$\begin{aligned} \text{"universe of classical matter"} \\ R_{\mu\nu}^{(+)} - \frac{1}{2}g_{\mu\nu}^{(+)} R^{(+)} &= \chi(T_{\mu\nu}^{(+)} - \delta_1 |T_{\mu\nu}^{(-)}|) \\ \text{"antimatter universe (twin)"} \\ R_{\mu\nu}^{(-)} - \frac{1}{2}g_{\mu\nu}^{(-)} R^{(-)} &= \chi(\delta_2 T_{\mu\nu}^{(+)} - |T_{\mu\nu}^{(-)}|) \end{aligned} \quad (34B)$$

In the Newtonian approximation, for both species of tensors, the fluid velocities are small relative to the speed of light  $c$  and the energy flow and the pressure are low. The energy-impulse tensors for a matter field can be written, in this case, as :

$$T_{\mu\nu}^{(+)} = \begin{pmatrix} \rho^+ c^2 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix} \quad T_{\mu\nu}^{(-)} = \begin{pmatrix} \rho^- c^2 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{pmatrix} \quad (35)$$

with  $\rho^+ > 0$  and  $\rho^- \leq 0$ .

The Einstein tensor is noted  $G_{\mu\nu}^{(+)}$  for the "universe of classical matter" and  $G_{\mu\nu}^{(-)}$  for the "antimatter universe". The system of two equations (34B) does not present mathematical and physical contradictions and does not constitute an incoherent system of equations because the momentum tensor  $T_{\mu\nu}^{(+)}$  is well coupled to a gravitational constant  $G > 0$  in the two equations:  $G_{\mu\nu}^{(+)} = +\chi T_{\mu\nu}^{(+)}$  for the "universe of classical matter" and  $G_{\mu\nu}^{(+)} = +\chi\delta_2 T_{\mu\nu}^{(+)}$  for the "antimatter universe". The classical matter attracts itself. In the same way the "negative" matter attracts itself because the coefficient  $|T_{\mu\nu}^{(-)}| = -T_{\mu\nu}^{(-)}$ , so the momentum tensor  $T_{\mu\nu}^{(-)}$  is well coupled to a gravitational constant  $G > 0$  in the two equations:  $G_{\mu\nu}^{(-)} = +\chi\delta_1 T_{\mu\nu}^{(-)}$  for the "universe of classical matter" and  $G_{\mu\nu}^{(-)} = +\chi T_{\mu\nu}^{(-)}$  for the "antimatter universe". The runaway effect is solved by this system of two equations with two unknowns, then masses with opposite sign (negative and positive) repel each other. The Newtonian approximation between masses of different signs stipulates the following interaction laws:

- Positive mass attracts positive mass.
- Negative mass attracts negative mass.
- Positive mass and negative mass repel each other.

These laws are supposed to solve the paradox of the runaway motion. The inert mass being always positive, the fundamental principle of dynamics is respected. The masses attract or repel each other, depending on whether they have the same sign or not. Contrary to the electrical case, a composite matter formed of positive and negative "serious charges" cannot maintain its coherence, and charges of different signs tend both to group together and to be placed as far away as possible from bodies of opposite charge. A "serious charge" of opposite sign can only flee from a center of homogeneous mass like the Earth, the Sun, the Galaxy... In the Earth's gravitational field, for example, a "serious charge" of opposite sign will be subjected to an acceleration given by :  $m_i \ddot{x} \propto \frac{M \cdot m_i}{r^2}$  leading to a law of escape in  $r \propto t^{2/3}$ .

Cosmologically, a universe initially formed of these two types of masses would see them separate like two immiscible fluids, leading to a "foam" formed of bubbles of negative mass matter, separated by walls and filaments of positive mass matter. The negative and positive matter of the metrics interacting through gravity could intervene in the explanation of dark matter, dark energy, cosmic inflation and the acceleration of the expansion of the Universe. The tetravalent reasoning makes it possible to demonstrate the existence of an enantiomorphic universe, i.e. formed of identical parts arranged in an inverse order with respect to a point, an axis or a plane of symmetry) of the same mass and twin to ours because in the tetravalent reasoning on the null/non-zero mass of a universe adjacent to ours one carries out a copy of the mass to be able to form a pair of equal masses. The symmetry is given by the mass duplication of the twin universe  $m^{twin}$  in a couple  $(m^{twin}, m^{twin})$

which then becomes the couple  $(m^{twin}, m)$  and it is this couple which gives the symmetry because the two masses are twinned and in the tetravalent reasoning on can keep only the case  $m^{twin} \neq 0$  and  $m \neq 0$ .

The black hole is a boundary effect between these two enantiomorphic twin universes. In the center of a "black hole", there is a perfectly black disc emitting no light corresponding to the Schwarzschild radius. When this disk is perfectly black and circular, it means that there is no negative mass on the other side of the boundary which repulses the positive mass of the neutron star (see FIGURE 2, Image of the supermassive black hole M87\* and its false-color accretion disk, April 10, 2019). It shows the "sharp swirl" of light around the black hole in galaxy M87, as seen in polarized light.

At the center of our galaxy is a supermassive black hole four million times more massive than the Sun. Surrounded by a glowing disk of moving matter, this bottomless pit of space-time is usually obscured by a veil of gas, dust and orbiting stars.

But scientists, using a global network of telescopes known as the Event Horizon Telescope (EHT), finally got a peek into the heart of the galaxy, and yesterday unveiled the first-ever image of the black hole's silhouette. The observations, made in 2017, were described in a series of scientific papers published this Thursday in the journal *Astrophysical Journal Letters*. "Today, the Event Horizon Telescope is delighted to share with you the first direct image of the gentle giant at the center of our galaxy - Sagittarius A\*," said Feryal Özel of the University of Arizona at a press briefing to announce the achievement. "I met him 20 years ago and have loved him and tried to understand him ever since. But until now, we didn't have the direct image that could confirm that Sagittarius A\* was indeed a black hole." The image shows an asymmetric ring of radiating matter surrounding a pit of darkness: the shadow of the black hole known as Sagittarius A\*. The photograph approaches the black hole's horizon, the point of no return beyond which stars, planets, dust and even light are lost forever.

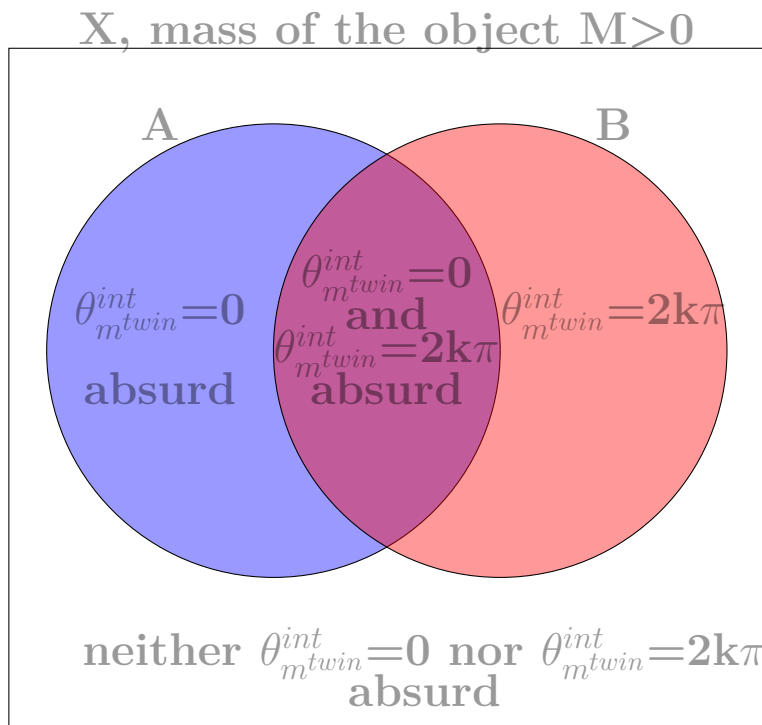
"Light that is too close to the black hole, close enough to be swallowed by it, eventually crosses its horizon and leaves behind only a dark void at its center," Özel explained.

This latest Event Horizon Telescope image is the result of a global collaboration of more than 200 scientists. In 2019, the latter had unveiled a similar-looking image of a huge black hole at the center of M87, a galaxy 50 million light-years away. The photograph marked the first time the shadow of a black hole had been directly observed. The two images were made by combining data from eight observatories around the world, turning the Earth into a huge telescope.

But the accretion disk in the image of the Sagittarius A\* black hole located in the center of our galaxy was imperfect, which is why it is called an asymmetric disk, and in this case it betrays a mass transfer into the twin universe that is disturbed by the negative mass at the boundary that has already been transferred.

The tetravalent logic makes it possible to superimpose the two states: "existence of the twin universe" and "non existence of the twin universe" and as the density of matter is negative in the twin universe, this results in the difference of two tensors of momentum energy in absolute value, instead of the classical sum of two states as for Schrödinger's cat:  $\frac{1}{\sqrt{2}} \cdot (|\text{died}\rangle + |\text{living}\rangle)$  which gives in this context, with unit vectors  $\frac{1}{\sqrt{2}} \cdot (|\text{non-existence}\rangle + |\text{existence}\rangle)$  which means  $\delta_1 \cdot (0 + (-|T_{\mu\nu}^{(-)}|)) = -\delta_1 \cdot |T_{\mu\nu}^{(-)}|$ . The correcting term in Einstein's equation is therefore equal to  $-\delta_1 |T_{\mu\nu}^{(-)}|$  where  $\frac{1}{\sqrt{2}}$  is entered in the attenuation factor  $\delta_1$ . As the internal angle  $\theta_{m^{twin}}^{int}$  of the twin universe (TIME+MASS) rotates in the other direction, then the superposition of the two states  $\frac{1}{\sqrt{2}} \cdot (|\text{non-existence}\rangle + |\text{existence}\rangle)$  gives  $\frac{1}{\sqrt{2}} \cdot (0 + (-2k\pi)) = -\sqrt{2}k\pi$  where  $k$  is the number of revolutions, as large as we want, so the masses can be aggregate by angular rotation. The simultaneous existence and non-existence of the twin

universe therefore corresponds to an angular difference, therefore to a mass difference  $M^+ - |M^-|$  because the mass corresponds to a sum of angles (with  $M^+ \gg |M^-|$ ). Evidently if the negative mass is preponderant (with  $|M^-| \gg M^+$ ) then we consider the difference  $|M^-| - M^+$ . It is possible that the two masses are of the same order  $M^+ \approx |M^-|$  but then the difference is zero and the repulsion of the two masses is explosive.



Consequently there are two cases:

- case 1: there is a disturbance mass  $M^-$  of radius  $r^-$  and density  $\rho^- \leq 0$  present in the twin universe and located sufficiently close to the mass  $M^+$  of radius  $r^+$  and density  $\rho^+ > 0$  (boundary between the two twin universes, neutron star which collapses on itself), it is located on the other side of the border but close enough for the repulsion between the two masses  $M^+$  and  $M^-$  to occur (existence of the twin universe). We replace  $M$  by the difference  $M^+ - |M^-|$  in the solutions of general relativity and  $\sqrt{\sum_{i=1}^p (\theta^{(i),+} - \theta^{(i),-})} \approx \text{constant}$  whereas  $\beta$  is no longer a constant, it is an angle that turns very quickly.
- case 2: there is indeed a mass  $M^-$  of radius  $r^-$  and density  $\rho^- \leq 0$  but it is too far from the boundary for the repulsion between the two masses  $M^+$  and  $M^-$  to occur (non-existence of the twin universe). This is Einstein's equation without the corrector term. We use the mass  $M$ ,  $\beta \approx \text{constant}$  and the  $\theta^{(i),+}$  angles of  $M = M^+$  turn very quickly in the same direction.

In the first case corresponding to the first equation of the couple, we have an equivalent positive mass  $M_{equi} = M^+ - |M^-|$  of radius  $r_{equi} = (\frac{\rho^+ r^{+3} - |\rho^-| r^{-3}}{\rho_{equi}})^{1/3}$  and  $\rho_{equi} = \frac{\rho^+ + |\rho^-|}{2}$ .

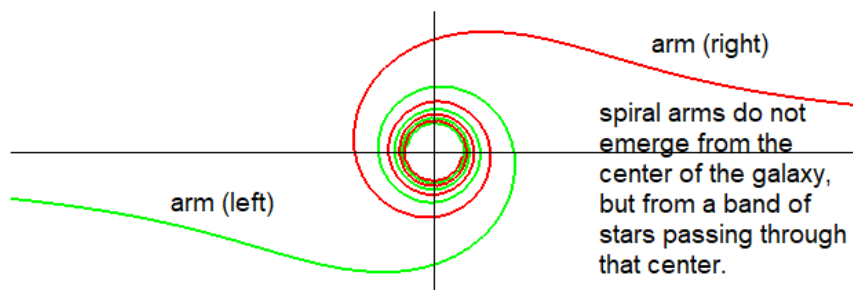


FIGURE 50A: Lituus spiral of equation  $r = \frac{C}{\sqrt{\theta}}$

In order to find the equation of the galaxies in the case where the center undergoes the influence of the twin universe, we write  $M_{equi}/r_{equi} = \sum_{i=1}^p \frac{\theta^{(i),+} - \theta^{(i),-}}{\beta} = \frac{4}{3} \pi r_{equi}^2 \rho_{equi}$  (where  $\rho_{equi}$  is a constant) which gives:

$$r = \frac{\sqrt{3}}{2\sqrt{\pi\rho}} \cdot \sqrt{\sum_{i=1}^p (\theta^{(i),+} - \theta^{(i),-})} \cdot \frac{1}{\sqrt{\beta}} \approx \frac{C}{\sqrt{\beta}} \tag{Spiral equation} \quad (36)$$

In case the two masses are sufficiently close to each other on each side of the border, the internal angles of the negative mass will turn very quickly in the opposite direction to the trigonometric direction of the internal angles of the positive mass, so the rotation of the angles will be slowed down by the opposite rotation of the internal angles of the negative mass, so the term  $\sqrt{\sum_{i=1}^p (\theta^{(i),+} - \theta^{(i),-})}$  will behave as a constant, and then when a part of the positive mass  $M^+$  is transferred to the twin universe, it becomes negative and thus agglomerates with the negative mass  $M^-$  according to Newton's law (attraction) to form an even greater negative mass near the boundary between the two universes (located at the center of galaxies or when a neutron star collapses), and so the other part of the  $M^+$  that remains in the positive mass universe, will get too close to the negative mass, so although the two twin universes are unrelated, the  $M_{equi}$  mass will be exploded by the repulsion force (Newton's law between two similar masses, one positive and the other negative) separated by a very small distance. So the required radius of the equivalent spherical mass  $M_{equi}$  will suddenly decrease and the corresponding  $\beta$  angle will therefore increase or decrease abruptly because  $\beta$  is the angular opening corresponding to the radius of the sphere of mass  $M_{equi}$ , which replaces the sphere of mass  $M$  in this case, otherwise it is the angular opening corresponding to the radius of the sphere of mass  $M$  as we saw previously. So the rotation of this angle will be important, and contrary to the case where there was no influence of the twin universe, it is  $\beta$  that will turn very fast while the difference  $\theta^{(i),+} - \theta^{(i),-}$  will remain static and behave as a constant. Thus equation (36) corresponds to the equation of a Lituus spiral which is the inverse of center  $O$  of the Fermat spiral whose equation. The Polar Equation of Lituus is  $r = \frac{C}{\sqrt{\theta}}$  where  $C$  is a constant.

The negative part will be expelled away from the boundary inside the twin universe of negative mass while the positive part will be back in the positive mass universe, and so the  $\beta$  angle to the denominator of  $\frac{C}{\sqrt{\beta}}$  will oscillate very quickly.

This curve was studied by Cotes and Maclaurin in 1722.

The Lituus (Latin word) is a stick of the Roman augurs, resembling the stock of today's bishops.



FIGURE 50B: The barred spiral galaxy NGC 1672 (Lituus shape)

Its other name is the Snail spiral.

Polar equation:  $r^2 = \frac{a^2}{\theta}$  (or  $r = \frac{a}{\sqrt{\theta}}$ ).

Curvilinear abscissa:  $\frac{ds}{d\theta} = \frac{a}{2\theta} \sqrt{\frac{4\theta^2+1}{\theta}}$ .

Radius of curvature:  $R_c = a \frac{(4\theta^2+1)^{3/2}}{2\theta^{3/2}(4\theta^2-1)}$ .

Transcendent curve.

The lituus is the place of the point M of a variable circle centered in O cutting the Ox axis into A such that the area of the circular sector OAM is constant equal to  $a^2/2$ .

The inflection point is obtained for  $q=0.5$  radians, or nearly  $30^\circ$ .

The lituus is the inverse center O of the Fermat spiral and the radial of the clothoid.

It is found in the volutes of the ionic capitals. The lituus corresponds to the shape of barred spiral galaxies. A barred spiral galaxy is a spiral galaxy whose spiral arms do not emerge from the center of the galaxy, but from a band of stars crossing that center. This phenomenon is related to the influence of the negative mass located in the twin universe near the border.

The spiral arms seem to emerge from the ends of the bars of these galaxies, while they seem to emerge directly from the nucleus of an ordinary spiral galaxy.

Edwin Hubble classified these types of spiral galaxies as SB (“barred spiral”) in his Hubble sequence. He listed them in three sub-categories, based on the shape and manner in which the arms of the spiral are arranged. The SBa types have arms that are closely related to each other. Conversely, the SBc types have arms that are very loose. Finally, the SBb types are in between. A fourth type, SBm, is then created to describe irregular barred spirals, such as those of the Magellanic Clouds, which were once classified as irregular galaxies.



In 2005, observations from the Spitzer Space Telescope supported earlier evidence that the Milky Way is a barred spiral galaxy. The observations made by the radio telescopes suggested for years that our galaxy was a barred spiral galaxy but the Spitzer images in the infrared regions of the spectrum, provided more precise elements.

Barred spiral galaxies are relatively numerous. Studies have shown that two out of three galaxies contain a bar. Different hypotheses exist concerning these bars.

The current hypothesis regarding these bars says that their structure acts as a sort of "stellar nursery", nurturing young stars. The bar is thought to act as a mechanism that feeds gas to the spiral's inner chains through orbital resonance, draining the flow (of gas) to create new stars. This theory explains why many barred spiral galaxies have an active galactic nucleus, such as that of the Southern Pinwheel Galaxy.

The creation of the bar is thought to be the result of a "density wave" radiating out from the center of the galaxy, the effects of which reshape the orbits of the inner stars. This effect implies that over time, stars orbit further outward, which enlarges the bar.

Bars are also thought to be a temporary phenomenon in the life of spiral galaxies, with the structure of the bar declining over time, transforming the barred spiral galaxy into a "regular" spiral galaxy. Beyond a certain size, the mass accumulated in the bar compromises the stability of the bar structure. Barred spiral galaxies with a large amount of energy accumulated at their center tend to have small, stubby bars. As many spiral galaxies have a bar structure, this seems to be a recurring phenomenon in the development of spiral galaxies.

In the center of the barred spiral galaxy the reformation of the internal stars is done when the positive mass is repelled by the negative mass, thus the activity of the central core is characterized by long periods where the negative mass of the twin universe and the mass positive about to be transferred repel each other. When the negative mass is expelled far enough, there is no longer this repulsion and the mass transfer normally takes place like a normal spiral galaxy (Fermat's spiral type), this is why as the structure ages of the bar declines over time, transforming the barred spiral galaxy into a "regular" spiral galaxy.

$$ds^2 = (1 - \eta \sum_{i=1}^p \frac{\theta^{(i),+}}{\beta}) c^2 dt^2 - (1 - \eta \sum_{i=1}^p \frac{\theta^{(i),+}}{\beta})^{-1} d\beta^2 - \beta^2 d\theta^2 - \frac{\sin^2(\beta)}{\beta^2} d\phi^2 \quad (36A)$$

"barred" spiral equation caused by the influence of the antimatter universe at the center of the

$$ds^2 = (1 - \eta \sum_{i=1}^p \frac{\theta^{(i),+} - \theta^{(i),-}}{\beta}) c^2 dt^2 - (1 - \eta \sum_{i=1}^p \frac{\theta^{(i),+} - \theta^{(i),-}}{\beta})^{-1} d\beta^2 - \beta^2 d\theta^2 - \frac{\sin^2(\beta)}{\beta^2} d\phi^2 \quad (36B)$$

$$r = C \cdot \sqrt{\sum_{i=1}^p \theta^{(i),+}} \quad (\text{"regular" spiral equation}) \quad (37A)$$

$$r = \frac{C}{\sqrt{\beta}} \quad (\text{"barred" spiral equation}) \quad (37B)$$

On FIGURE 50B, we can clearly see the Lituus spiral shape (equation (37B)), located inside the galaxy. This is a spectacularly accurate image of the barred spiral galaxy NGC 1672, a galaxy that lies some 60 million light-years from our Milky Way, in the southern sky, within the constellation of Dorado. This composite image of the barred spiral galaxy NGC 1672 was made using filters that isolate light from the blue, green and infrared parts of the spectrum as well as the emission of ionized hydrogen. This galaxy is also classified as a Seyfert galaxy, a galaxy with a particularly

active core. The barred spiral galaxy NGC 1672 extends over about 75,000 light-years.

Remember that barred spiral galaxies have this particularity that their arms do not emerge directly from their nucleus. But from the ends of a bar of stars passing through this core. Astronomers believe that they are the scene of a unique mechanism that channels the gas from the disk to the galactic center. The barred area would correspond to a region of star formation.

In this image taken by the Hubble Space Telescope, the dust lanes that extend away from the core of NGC 1672 are particularly noticeable. They follow the inner edges of the spiral arms. Clusters of hot, blue young stars form along these arms and ionize the surrounding clouds of hydrogen gas, which glow red. Delicate curtains of dust partially obscure and redden the light of the stars behind them by diffusing a blue light.

Some galaxies seem to be integrated with NGC 1672. They are actually far behind. And they are reddened by dust. Some bright foreground stars, located inside our Milky Way, sparkle in the image like diamonds.

On April 24, 2020, NASA and ESA will celebrate the 30th anniversary of the launch of Hubble. While waiting to discover the thirtieth "iconic image" that will be unveiled for the event, we invite you to dive into the immense icon library of the famous space telescope.

There are also arm outgrowths, as for all spiral galaxies, these arms are the result of a density wave that leads to the formation of stars. The existence of these spiral arms has, at first, puzzled scientists, because the stars at the end of the galaxy would rotate faster than those in the center (if the galaxy is rotating). In reality, the spiral arms are not the result of the movement of a galaxy, but of a density wave that leads to the formation of stars. For this reason, the arms appear brighter because there are more young stars, not because the galaxy or the stars are moving in such a way as to produce arms. For example, the Milky Way has four major spiral arms, the Perseus arm, the Sword-Cross arm, then the Sagittarius-Carina arm and the more tenuous Ruler arm. The Orion arm, where the Sun and Earth are located, is a minor spiral arm of the Milky Way. These arms correspond to angular jumps:

$$\begin{aligned} r_1 &= \theta, \theta \in [\pi/4, 9\pi/4] \\ r_2 &= \theta + \pi/2, \theta \in [-\pi/4, 7\pi/4] \\ r_3 &= \theta - \pi, \theta \in [3\pi/4, 11\pi/4] \\ r_4 &= \theta + \pi, \theta \in [-3\pi/4, 5\pi/4]. \end{aligned}$$

What is important are the domains of variation of the functions which must take into account the rotations. For example, you go from the first line to the second by adding  $\pi/2$  to the argument of the function which corresponds to a direct quarter turn for the graph, but since we are restricting ourselves to an arc of the curve, we have to do a translation of the plot boundaries of  $-\pi/2$ .

In the case of equation (37A), the negative mass is too far from the boundary to have an influence on the mass transfer to the twin universe (collapse of a giant neutron star or collapse of the central galactic nucleus), and then the term is tucked into the constant  $C$  and the internal mass angles  $\theta^{(i),+}$  rotate very fast, so we have Fermat's spiral equation  $r = C\sqrt{\theta}$  with the formation of arms resulting from the gravitational waves emitted during the mass transfer:

$$\begin{aligned} r_1 &= C\sqrt{\theta}, \theta \in [\pi/4, 9\pi/4] \\ r_2 &= C\sqrt{\theta + \pi/2}, \theta \in [-\pi/4, 7\pi/4] \\ r_3 &= C\sqrt{\theta - \pi}, \theta \in [3\pi/4, 11\pi/4] \\ r_4 &= C\sqrt{\theta + \pi}, \theta \in [-3\pi/4, 5\pi/4]. \end{aligned}$$

This type of regular spiral galaxy is shown in FIGURE 20 with the Fermat'spiral galaxy M51. Spiral galaxies represent about 70% of the galaxies in the known universe. The so-called "irregular" galaxies are few in number, they were very numerous at the beginning of the universe but their number has decreased following the collisions between them which formed elliptical galaxies. At the moment, they represent about 10% of galaxies. Irregular galaxies are generally rich in gas, dust and young stars. The elliptical galaxies correspond to the merger of two spiral galaxies, they are about 20% of galaxies in the known universe. Because the observable universe contains a larger proportion of spiral galaxies than elliptical ones (77% vs 20% ), one might think that the process of scavenging interstellar gas has less effect than the gravitational interaction between galaxies.

A spiral galaxy is a type of galaxy containing up to several hundred billion stars and which adopts the flattened shape of a disk, with a central spherical bulge called the bulge. Spiral galaxies also contain, and in a variable way, important quantities of gas and dust. Around the disk, there is also a less dense and more discrete halo, with stars frequently grouped in globular clusters.

The disk typically contains several luminous arms, where the youngest and most luminous stars are located. These arms wrap around the center forming a spiral, giving the galaxies their name. Spiral galaxies are considered to be among the most beautiful objects in the sky and are often used as illustrations in the press and the general public, including outside the field of astronomy. The galaxy M51, also known as the "Whirlpool Galaxy" or "Hound Galaxy" is one of the most emblematic representatives.

Spiral galaxies belong to the three main classes of galaxies established by Edwin Hubble in his 1936 book, *The Kingdom of Nebulae*. As such, they belong to the Hubble sequence.

Our galaxy, the Milky Way, is a spiral galaxy, but it also has a central bar, discovered in the 1990s, which makes it a barred spiral galaxy, the detailed structure of which is not known with certainty today. Our position on the galactic disk obviously makes it very difficult to observe this part of the Milky Way. The most convincing evidence of this existence comes from a study of stars in the galactic center made with the Spitzer space telescope.

Spiral galaxies are very dynamic entities: they are notably the place where stars are formed. Their disk contains many young stars, the older stars tend to occupy their central bulge, while the diffuse halo is made up of the oldest stars. The stars form from concentrations of the interstellar medium that occur only in the galactic disk. Their diameter is generally between 20 and 60 kiloparsecs (50,000 to 200,000 ly), and their mass is between  $10^{10}$  and  $10^{11}$  solar masses.

Modern telescopes have revealed that many spiral galaxies host supermassive black holes at their centers, whose masses can exceed several hundred million solar masses. Both spiral and elliptical galaxies are known to contain these exotic objects. In fact, many astronomers now believe that all large galaxies contain a supermassive black hole at their core. Our galaxy is known to host a black hole in its center, Sgr A\*, with a mass of several million solar masses.

Together with irregular galaxies, spiral galaxies constitute 70% of the population of the local Universe. They are found mainly in regions of low density and rarely in the centers of galaxy clusters.

Galaxies are classified according to a "selection fork diagram" called the Hubble sequence. The beginning of the fork classifies elliptical galaxies according to a scale, from the most round, rated E0, to the most flattened, rated E7. On the "branches" of the fork are the two types of spiral galaxies: the "normal" spirals, with a more or less regular bulge, and the "barred" spirals, whose nucleus is more or less stretched, with a line of stars crossing the center. Barred spiral galaxies constitute approximately 50% of the total population of spiral galaxies (see FIGURE 50B).

The shape of a spiral galaxy intuitively follows from the exercise of gravitational forces (with

the familiar shape of a vortex around a central attractor). However, that of barred spirals has long intrigued astronomers. Computer simulations suggest that the barred spiral shape appears quite easily when two galaxies cross (which leads to relatively few collisions, the average density of galaxies being lower than that of cigarette smoke). A crossing of this type is expected between our galaxy and the Andromeda galaxy in four billion years, but we cannot predict today if it will give a similar result.

The two types of spiral galaxies are subdivided according to the prominence of their central "bulge", the brightness of their surface and the narrowing of their spiral arms. All these characteristics are related, so that a Sa galaxy has a large central bulge, a large luminous surface and arms wound into a tight spiral. An Sb galaxy shows a smaller bulge, a fainter disk and looser arms, and so on for the Sc and Sd types. The barred galaxies are characterized according to the same pattern, respectively in SBa, SBb, SBc and SBd.

There is another class of galaxies called S0, morphologically transitional between spiral galaxies and elliptical galaxies. Its spiral arms are so tightly wound that it is not possible to distinguish them; S0 galaxies have a disk of uniform luminosity. They are also affected by a very important bulge. Just as stars can be intrinsically bright or intrinsically dim, spiral galaxies can also exhibit a range of luminosity. For this reason, Sidney van den Bergh introduces an additional descriptor for spiral galaxies, namely a galaxy luminosity class.

In this system, each spiral galaxy is assigned a luminosity class ranging from I for the brightest to V for the faintest. Since the total luminosity corresponds roughly to the total mass of the visible stars, the spiral galaxies of luminosity class I are also the most massive and they have the largest spiral arms.

The luminosity class of the galaxies is also well correlated with the regularity of the spiral structure, the most luminous galaxies, thus the most massive, being the most ordered. This is simply explained by the density wave model of spiral arm formation. The more massive the galaxy, the more gas clouds will be concentrated in the high density regions. As more gas is available, more new blue stars will be formed there, making the spiral structure more defined.

This characteristic is now also applied to irregular galaxies as can be seen in the NASA/IPAC database.

An example of a spiral galaxy is the Andromeda Galaxy.

The Andromeda Galaxy, also identified as M31 in the Messier Catalog and NGC 224, is a spiral galaxy located about 2.55 million light-years from the Sun in the constellation Andromeda.

The Andromeda galaxy (NGC 224) was used by G rard de Vaucouleurs as a morphological type SA(s)b galaxy in his galaxy atlas.

Called the Great Andromeda Nebula until its true nature was recognized in the 1920s, the Andromeda Galaxy is the closest spiral galaxy to the Milky Way (all classes combined, the closest galaxy is the Great Dog Dwarf) and the largest member of the Local Group of about 60 individual galaxies of which both are members. With a diameter of about 220,000 light-years, it would contain about a thousand billion stars, two to five times more than our galaxy.

With a visual magnitude of 3.4, the Andromeda galaxy is one of the few galaxies observable with the naked eye from Earth in the northern hemisphere. It is also one of the most extended objects in the sky, with an apparent diameter of  $3.18^\circ$ , more than six times the apparent diameter of the Moon observed from Earth.

The first known written mention of the Andromeda Galaxy dates back to 964, when it was described by Abd al-Rahman al-Sufi in his Book of Fixed Stars. The first observation of the galaxy with a telescope was made by Simon Marius in 1612 (often described as the discoverer of the galaxy). It

was photographed for the first time in 1887 by the astronomer Isaac Roberts, in his observatory of Crowborough in Sussex.

In the 1920s, Cepheid variable stars were identified by Edwin Hubble in astronomical photographs of the nebula. Thanks to the period-luminosity relation established in 1912 by Henrietta Leavitt, the latter established the distance of the stars and confirmed the extragalactic nature of the object. It also allows to reinterpret an event of 1885 which had been considered as a nova. Because of the distance of the galaxy, this event, of relatively low apparent magnitude, was in fact extremely luminous on the scale of a galaxy. This supernova was discovered on August 20, 1885 by Ernst Hartwig. It was in fact a supernova (a star explosion), later named SN 1885A. It was the first supernova seen since the invention of the telescope, and the only one known in the Andromeda galaxy.

In 1943, while Los Angeles was under curfew, Walter Baade used the Hooker telescope on Mount Wilson and, for the first time, resolved stars in the central region of the galaxy.

In 1953, the study of M31 by Edwin Hubble and Allan Sandage revealed a new class of variable stars, the blue luminous variables (or BLVs). According to the results of numerical simulations carried out by a Franco-Chinese team using GENCI's high-performance computing facilities, the Andromeda galaxy was formed less than three billion years ago, at a time when the Earth already existed, and is the result of the collision of two galaxies.

The Andromeda galaxy seen in the infrared by the WISE space telescope.

The Andromeda galaxy captured from the Killarney Park Observatory (Ontario, Canada) Several independent methods of evaluating extragalactic distances have been used to measure the distance of the Andromeda galaxy, giving quite convergent results.

Thus, the measurement of the periodicity of cepheids in this galaxy allowed in 2004 to determine their absolute magnitude and thus to deduce their distance by comparison with their visual magnitude  $3.18$  at  $770 \pm 0.06$  kpc (2.51 million ly).

At the same time, the discovery of an eclipsing binary whose component sizes and temperatures - and thus absolute magnitudes - could be accurately determined similarly allowed us to determine the galaxy's distance at  $2.52 \pm 0.14$  million ly by comparing their absolute magnitudes with their visual magnitudes. (773 kpc), a measurement in remarkable agreement with the previous one by an independent method.

The infrared luminosity of population II stars at the top of the red giant branch is another distance indicator used to assess the remoteness of galaxies; applied to the Andromeda galaxy, this measurement yielded a value in 2005 of  $2.56 \pm 0.08$  million ly (785 kpc).

Combined with an earlier measurement by the infrared surface brightness fluctuation method, which in 2003 gave a distance of  $2.57 \pm 0.06$  million ly (788 kpc), all these values give an average distance estimate for the Andromeda galaxy close to  $2.54 \pm 0.06$  million ly (779 kpc).

The total mass of the Andromeda galaxy - baryonic matter + dark matter - has been estimated to be probably around 1,230 billion solar masses, with however possible minimum and maximum values of 630 billion and 4,100 billion, respectively. The value of 1,230 billion solar masses corresponds to less than two thirds of that of the Milky Way, estimated by this same study to be around 1,900 billion solar masses (at least 200 billion but not more than 5,500 billion). The uncertainties attached to these two estimates are however too large to be able to conclude definitively. However, we can now retain that the mass of these two galaxies is of the same order of magnitude and that the density of stars in the Andromeda galaxy is higher than that observed in our galaxy.

The Andromeda galaxy therefore contains more stars than the Milky Way, and its total luminosity has been estimated at about 26 billion times the solar luminosity, or about 25% more than the

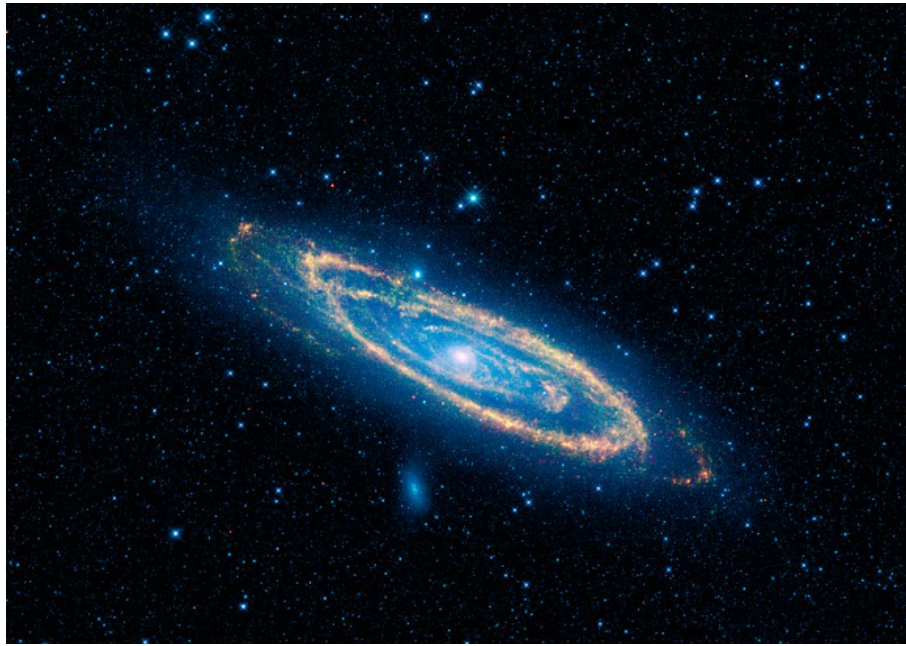


FIGURE 50C: The Andromeda galaxy seen in the infrared by the WISE space telescope.

total luminosity of our own galaxy. However, the Milky Way has a star formation rate three to five times that of the Andromeda Galaxy, with a rate of supernovas twice as high, so that the Andromeda Galaxy appears to have reached a state of relative rest after a sustained star formation phase, while our galaxy appears to be much more active in this area; if this were to continue, the total luminosity of the Milky Way would eventually surpass that of the Andromeda Galaxy.

Detailed spectroscopic studies have allowed to trace the rotation curve of the Andromeda galaxy. Starting from the galactic center, the velocity of the stars increases to a local maximum of 225 km/s at 1300 light-years (400 pc) then passes through a local minimum of 50 km/s at 7000 light-years (2 kpc) before passing through a maximum of 250 km/s at 33000 light-years (10 kpc) and gradually decreasing to 200 km/s at 80000 light-years (24.5 kpc). This curve implies that the total mass of the Andromeda galaxy grows linearly up to 45 000 light-years (13.8 kpc) from the center, then more slowly beyond; the nucleus would have a mass of 6 billion solar masses.

The Andromeda galaxy hosts a particularly compact stellar cluster at its center, with a double structure revealed by the Hubble Space Telescope in 1993. The brighter cluster, designated P1, is distinct from the center of the galaxy, which is in fact materialized by the less bright of the two clusters, called P2; these two components are separated by a distance of about 4.9 light-years (1.5 pc).

P1

The nature of the P1 concentration is not fully understood. The first interpretations made it the residual core of an old cannibalized galaxy, but calculations quickly showed that such a structure could not remain coherent for very long in the vicinity of a supermassive black hole of this size, which would have dispersed it under the effect of tidal forces. It was then proposed that a second

supermassive black hole, this time at the center of P1, could have stabilized this structure in the long term, but the distribution of stars in P1 does not support the existence of such a black hole at its center. P1 could correspond more to an accumulation of stars at the apoapside of their orbit around the supermassive black hole of the galaxy.

P2

P2 contains a supermassive black hole whose mass was estimated at 30 to 50 million solar masses in 1993 and then re-evaluated at 110 to 230 million solar masses in 2005 (about 40 times the estimated mass of the one in the center of the Milky Way, Sagittarius A\*). The velocity dispersion measured around this object is close to 160 km/s, which allowed to refine the estimate of the mass of this supermassive black hole using the M-sigma relation.

The supermassive black hole at the center of Andromeda corresponds to the border of mass transfer between the two twin universes, the central bulge of the galaxies is a transfer zone where the mass disappears to join the other universe. This is why the term black hole is not appropriate, because it is not a hole, there is no "tunnel", the mass becomes negative "naturally". As this mass is considerable; several hundred million solar masses for the Andromeda galaxy, the transfer is not done piece by piece according to the gravitational conditions, and thus the variable folds of space are not optimal, because a part of the mass cannot become negative because of the enormous gravitational attraction which applies between masses of several tens of millions of solar masses (positive) according to the law of Newton. So when a small part of the mass of the bulge is transferred, the other part remains positive in the positive mass universe, and so the bulge sees its mass slowly decreasing in the course of time when the galaxy advances in age but the spiral shape remains. The gravitational excess located at the center of the galaxies prevents that all the mass of the central bulge is transferred at once and thus the variable folds of space-time oscillate without ever being optimal in terms of minimum distance between two regions of the universe. The isodynamic conditions of space are not satisfied (Image B in FIGURE 21).

The active nucleus/supermassive black hole at the center of the galaxy bears the designation M31. According to a study of 76 galaxies by Alister Graham, the central bulb of M31 contains a supermassive black hole whose mass is estimated at  $1.4 \times 10^8$  solar masses. The black hole term used by Earth scientists is not suitable because the gravitational singularity applies only to the positive mass in transition to become negative. There is no tunnel that transports the mass to another universe. The two universes are unrelated, the boundary is created by the incredible gravitational density that makes disappear the structural differences in the internal angles of subatomic particles, some of which will be swallowed up and transferred into the negative mass universe. It is the incredible gravitational power that reigns there, so intense that it reverses the internal angles of a part of the mass of the galactic bulb, the space is bent, but in a non-optimal way. When a much more modest neutron star, of about ten solar masses, collapses on itself, its entire mass can become negative but by emitting radiation, in this case, the isodynamic conditions of space can be satisfied because everything is transferred at once, the entire mass becomes negative and disappears in the twin universe (Image C in FIGURE 21).

In the visible light range, the Andromeda galaxy has a spiral structure with no apparent bar or ring, noted as SA(s)b in the Vaucouleurs system. Data from the 2MASS project, which mapped the sky in the infrared at a wavelength of  $2 \mu\text{m}$ , suggest, however, that the bulge of this galaxy would be box-shaped, making it a barred spiral galaxy like the Milky Way, with the bar seen almost in the direction of greatest length.

Data acquired in 1998 in the infrared by the ISO space telescope of the European Space Agency have also highlighted the presence of concentric rings, one of which, at about 33 000 light-years (10

kpc) from the galactic center, concentrates most of the dust and much of the gas of the entire galaxy. These rings are only visible in infrared because they are made of cold dust - at a temperature below 15 K - which does not radiate at visible wavelengths. The existence of this ring could indicate that the whole galaxy is evolving towards a ring galaxy shape.

The center of this ring is offset from the center of the galaxy, and a more inner ring, also offset by about 1,600 light-years (500 pc) and extending about 4,900 x 3,250 light-years (1.5 x 1.0 kpc), seems to be directly related to the collision, about 210 million years ago, of the small elliptical galaxy M32 with the Andromeda galaxy, the latter having been hit along its polar axis, stripping M32 of more than half of its mass.

Moreover, the galactic disk is not flat but rather twisted when observed in detail, for example at 21 cm, the origin of this torsion seems to come from small satellite galaxies, in particular the Triangulum galaxy. It is particularly visible since the galactic disk is seen at an inclination of about 77° (a galaxy seen from the edge would be seen at an angle of 90°).

The spiral arms of the Andromeda galaxy are marked by H II regions, which appear in red on the color images and follow the winding of these arms. These arms appear to be very tightly wound, although in fact they are more widely spaced than those of our galaxy. Two large spiral arms are clearly visible, separated from each other by a minimum of 13,000 light years (4 kpc). This spiral structure could be related to the gravitational interaction between the Andromeda galaxy and the M32 galaxy, underlined by the dynamics of the molecular clouds of this galaxy.

The central bulge of the Andromeda galaxy is shaped like a box or a central bar, because the transfer of mass in the twin universe reveals a negative mass close to the boundary between the two universes which is not repulsed immediately by the positive mass not transferred, so we find the same phenomenon as for barred spiral galaxies in which a negative mass perturbs the mass transfer generated by the density of phenomenal matter that reigns at the center of the galaxies. This is why many galaxies of "regular" shape are reclassified as rod spiral galaxies because there is a phenomenon of a box bulb in the internal structure of the galaxy related to the fact that the spherical mass sees its internal angles slowed by the internal angles of the transferred negative mass that they rotate in the other meaning, therefore the radius of the bulb oscillates without spreading to the whole galaxy because the repulsion of the two masses (positive and negative) at the border does not last. So the "Lituus" spiral remains confined to the center of the galaxy. This is no longer true when there was already a negative mass close to the border between the two universes, this negative mass blocks the mass transfer long enough because the transferred negative mass will first stick, to the existing negative mass on the other side of the border according to the law of attraction of two negative masses (Newton), and therefore repulsion will not take place for a certain period of time, until the positive mass is sufficiently close to the negative mass that has aggregated in the twin universe, there is a repetition of 3 steps:

1. Mass transfer (positive to negative) in the twin universe
2. Attraction between negative masses in the twin universe
3. Positive mass/Negative mass repulsion at the border between the twin universes

The second stage only executes for rod spiral galaxies since there is already a negative mass that disrupts the normal functioning of the galactic bulb that transfers its mass into the twin universe. There are about 460 globular clusters associated with the Andromeda galaxy. The most massive of them, called Mayall II, or "G1" for Globular One, is the brightest globular cluster of the Local Group.



It contains several million stars and is nearly twice as bright as Omega Centauri, the brightest globular cluster associated with our galaxy. Several generations of stars of varying metallicity are present, and G1 seems too massive for an ordinary globular cluster, which has led to the idea that it is in fact the nucleus of a dwarf galaxy whose outer parts were assimilated long ago by the Andromeda galaxy itself.

The Andromeda galaxy also contains a well-known stellar association, NGC 206, but also much larger associations, the mass of a globular cluster but much more extensive and therefore much less dense, which are not known in the Milky Way.

The spectroscopic analysis of the stars in the halo of the Andromeda galaxy shows that the latter is similar to that of our galaxy, with a lower metallicity than in the galactic disk and decreasing with the distance to the galactic bulge. This would indicate that these two galaxies would have undergone a comparable evolution, absorbing up to perhaps two hundred dwarf galaxies before acquiring the size they have today.

The most distant stars in the Milky Way and Andromeda galaxies' halos are perhaps as much as a third of the distance between these two galaxies.

#### Satellite galaxies

About twenty dwarf galaxies orbit the Andromeda galaxy. The most massive is the Triangulum galaxy, a well-drawn spiral galaxy easily recognizable, but M110 is also very well known, being always well visible on the overall images of the Andromeda galaxy as a small elliptical galaxy oriented obliquely to its large neighbor. M32, a dwarf elliptical galaxy called "compact", is more discreet but also always visible as a small disk with slightly blurred contours at the edge of the Andromeda galaxy disk; M32 is most likely at the origin of some morphological perturbations within the Andromeda galaxy disk following the almost orthogonal crossing of the latter some 210 million years ago. The other satellites are small elliptical dwarf galaxies or spheroidal dwarf galaxies.

A study published in the spring of 2006 indicated that most of the spheroidal dwarf galaxies (including transitional to irregular galaxies) - Pegasus Irregular Dwarf Galaxy, Andromeda I, Andromeda III, LGS 3, Andromeda V, Andromeda VI, Andromeda VII, and Andromeda IX - and the elliptical galaxies - M32 and NGC 147 - are within 16 kpc of a plane through the center of the Andromeda Galaxy. If Andromeda II, NGC 185 and M110 deviate significantly from this plane, the Triangulum galaxy, which is a spiral galaxy, is close. The reason for this coplanar distribution is still a matter of speculation, but the fact that this plane also includes the nearby group of galaxies called the M81 group may indicate the presence of a concentration of dark matter distributed in a large-scale plane in the nearby Universe.

In the case of equation (37B), the negative mass is close enough to the boundary between the two universes to temporarily block or delay the mass transfer, it is the activity of the galactic bulb responsible for the rod spiral shape having as equation the lituus  $\frac{C}{\sqrt{\theta}}$  always with the formation of arms resulting from gravitational waves emitted during mass transfer:

$$r_1 = C \frac{1}{\sqrt{\theta}}, \theta \in [\pi/4, 9\pi/4]$$

$$r_2 = C \frac{1}{\sqrt{\theta + \pi/2}}, \theta \in [-\pi/4, 7\pi/4]$$

$$r_3 = C \frac{1}{\sqrt{\theta - \pi}}, \theta \in [3\pi/4, 11\pi/4]$$

$$r_4 = C \frac{1}{\sqrt{\theta + \pi}}, \theta \in [-3\pi/4, 5\pi/4].$$

Barred spiral galaxies have a non-negligible bar of stars crossing their nucleus. In this case, the spiral arms come from the ends of the bar and not directly from the core. In some cases, there may be two bars, one large in scale, and the other smaller and closer to the core. This is one of the mechanisms invoked to explain how matter "falls" towards the central black hole of galaxies with

an active nucleus.

Bars have special dynamic properties. Interactions/mergers of galaxies can create them, but also destroy them. In general, it seems that the bars have a relatively short lifespan; they can be created and destroyed once or several times during the life of a spiral galaxy.

The bars result from the activity of the central core, when the negative mass blocks the transfer of mass which does not normally take place, but after several repetitions of these 3 steps:

1. Mass transfer (positive to negative) in the twin universe
2. Attraction between negative masses in the twin universe which temporarily blocks the mass transfer of the positive mass that was to be transformed into negative mass
3. Positive mass/Negative mass repulsion at the border between the twin universes

The negative mass is definitely pushed away from the boundary, towards the interior of the twin universe, it does not disturb any more the transfer of mass, which is thus done normally as it is the case in the central bulb of regular spiral galaxies.

Equation spirals  $r = a\theta^n$  (sometimes called Archimedean spirals of index  $n$ ) :

- the Archimedean spiral ( $n=1$ ) and its cousin the circle involute.
- the hyperbolic spiral ( $n=-1$ ).
- the Fermat spiral ( $n=1/2$ ) (special case of parabolic spiral)/"Regular spiral galaxies".
- the lituus ( $n=-1/2$ )/"Barred spiral galaxies".

The arms are formed because of the disturbance of the negative mass which blocks the transfer of mass and which attenuates the rotation of the internal angles of the mass which collapses on itself while accelerating the rotation of angular opening corresponding to the radius of this spherical mass located at the center of these galaxies. But after a certain time, these arms disappear because the negative mass ends up being evacuated law of the border automatically, therefore in this phase of transition we have a mixed galaxy which is a mixture between the spiral of Fermat ( $n=1/2$ ) and the lituus ( $n=-1/2$ ), they are the ANALLAGMATIC spirals whose polar equation is  $2n\theta = (\frac{r}{a})^n + (\frac{a}{r})^n$  ( $n > 0$ ) i.e.  $r^n = a^n(n\theta \pm \sqrt{n^2\theta^2 - 1})$  and you can choose  $n=1/2$  to obtain this mixture Fermat/Lituus spiral.

The long coiled arms of M83 (NGC 5236), a typical spiral galaxy, sometimes earns it the nickname of the Southern Pinwheel Galaxy. Spiral galaxies contain billions of stars and the youngest are located in the arms. These younger, hotter stars strongly emit blue light. Lines of dust are also present in the arms of the spiral galaxies, further enhancing the appearance of the spiral structure. The space between the arms of spiral galaxies contains as much matter as in the arms, but as the stars found there are older, they are less luminous and the space between the arms seems more empty. There have been a high number of supernovae in M83, six in the 20th century, more than in any other galaxy in the Messier catalog. (Credit and Copyright: D. Malin (AAO), AATB). It is

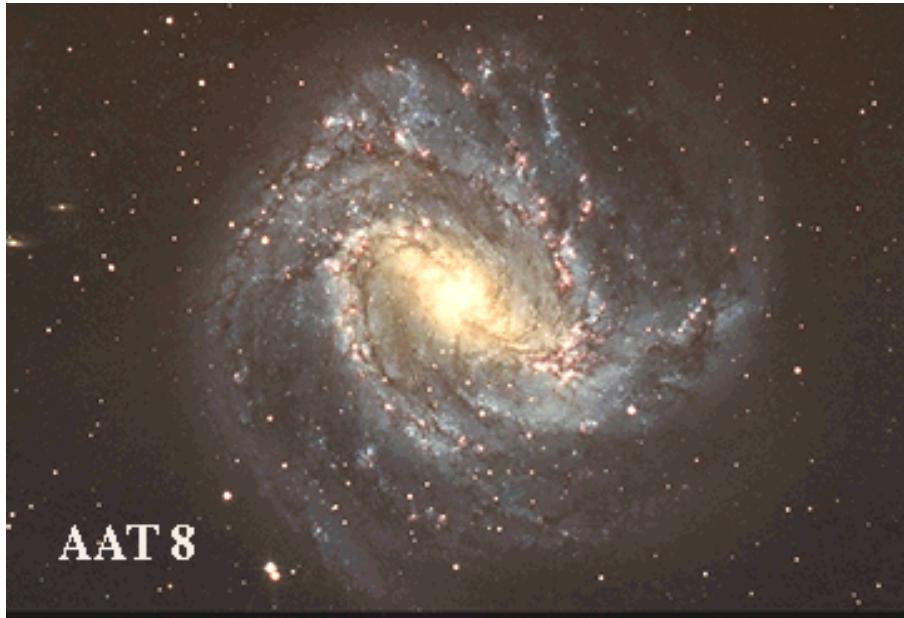


FIGURE 50D: The M83 galaxy (NGC 5236) (Anallagmatic spiral shape)

an example of an anallagmatic galaxy (FIGURE 50D).

M83 (NGC 5236) is a relatively close intermediate spiral galaxy located in the constellation Hydra about 15.2 million light-years from the Milky Way. It was discovered by French astronomer Nicolas-Louis de Lacaille in 1752. Because of its resemblance to M101, the Moulinet galaxy, M83 is sometimes referred to as the southern Moulinet galaxy.

M83 captured at La Silla Observatory (European Southern Observatory (ESO)). M83 was used by Gérard de Vaucouleurs as a galaxy of morphological type SAB(s)c in his galaxy atlas.

The luminosity class of M83 is III and it exhibits a broad HI line. It also contains regions of ionized hydrogen. M83 also exhibits a jet of radio waves and is a Flat-Spectrum Radio Source galaxy and a starburst galaxy.

It was the French astronomer Nicolas-Louis de Lacaille who discovered M83 on February 23, 1752 at the Royal Observatory at the Cape of Good Hope. M83 was the first galaxy discovered beyond the Local Group and the third of all galaxies after M31 and M32. Subsequently, Charles Messier observed this galaxy and he obviously listed it on February 17, 1781 in his famous diffuse objects not to be confused with a comet.

Many astronomers subsequently observed M83, William Herschel on March 15, 1787, James Dunlop on April 29, 1826, John Herschel on March 5, 1834, and William Lassell in May 1862.

Distance from M83

M83 is a galaxy close to the Local Group and often for this kind of galaxy, their own speed is important compared to the speed of recession produced by the expansion of the Universe. We can rely on the Hubble-Lemaître law to calculate the distance of a distant galaxy from the redshift, but this is not the case for galaxies that are too close. The Hubble distance for M83 gives a value of  $7.16 \pm 0.52$  Mpc (23.4 million ly).

To date, about twenty measurements not based on redshift (redshift) give a distance of  $6.510 \pm 3.420$  Mpc (21.2 million light-years), which is within the distances calculated using the offsetd value. However, in the sample presented on the NASA/IPAC database, several measurements are based on the period-luminosity relationship of the Cepheids of M83 and on the TRGB (Tip of the Red Giant Branch) method. These two methods give more accurate results than the others. For M83, an average of the measurements made by these two methods gives a distance of  $4.66 \pm 0.07$  Mpc (15.2 million ly).

M83 is classified as an intermediate spiral galaxy by several sources, but there is no consensus. Some do not see the presence of a bar in the center of this galaxy, while another source classifies it as a barred spiral. The image obtained from the Pan-STARRS survey data as well as those from the ESO do not clearly show the presence of a bar, nor even that of the Hubble Space Telescope for that matter. The intermediate spiral classification adopted by the NASA/IPAC database and by G rard de Vaucouleurs seems to suit this galaxy better than the barred spiral classification.

M83 by the Hubble Space Telescope.

Modern images obtained by large telescopes show well-defined spiral arms dotted with blue regions, open clusters of young blue stars, and pinkish HII regions, sites of star formation. M83 is referred to by some as a grand style spiral galaxy. We can also distinguish bands of dust in the central region whose yellowish color reveals the presence of older stars.

In 2020, using the MUSE instrument on ESO's Very Large Telescope, a starburst region barely larger than 1.0 arc minute was discovered at the core of M8313 .

A nursery of stars at the heart of M83.

But this is not the only process at play at the center of this galaxy. The supermassive black hole is swallowing vast amounts of matter, too much, and at the same time ejecting vast amounts of matter and energy outward making the starburst region even more messy.

A disc surrounding the nucleus

Thanks to observations from the Hubble Space Telescope, a star-forming disk has been detected around the core of M83. The size of its semi-major axis is estimated at 130 pc (425 light-years).

Black hole Thanks to observations in the X-ray domain made by the Chandra space telescope, a black hole has been discovered in the central region of M8315.

A black hole in the heart of M83? (No! A border effect between the two twin universes.)

The observations carried out by Chandra allowed to discover a powerful explosion produced by the presence of a black hole within M83. Astronomers have indeed found a new ultraluminous X-ray source (ULX). Such sources emit more X-rays than the average binary system. ULXs consist of a star orbiting a neutron star collapse. The image on the left is from the Very Large Telescope and the one on the right shows the Chandra data in pink and the Hubble Space Telescope data in blue and yellow. The ULX is located at the bottom of this composite image. Observations made over several years have shown that the intensity of the X-rays emitted by the ULX has been multiplied sometimes by more than 3000, one of the largest variations observed for this type of object. The visible images reveal a bright blue source at the same position as the ULX during its meteoric increase in intensity, a source that was not there before.

These results imply that the black hole's companion is a red giant star with a mass less than about four times that of the Sun. Astronomers believe that the bright blue optical emission observed in the X-ray burst comes from the accretion disk surrounding the black hole. The visible emission from this disk would have increased dramatically as it obtained more material from the companion star.

Another highly variable ULX with an old red star as a companion to a black hole was recently

found in M31. The new ULXs in M83 and M31 provide direct evidence of a much older population of black holes than those generally considered to be present in ULXs. Researchers estimate that the black hole mass of the ULX in M83 ULX is between 40 and 100 times that of the Sun. A lower mass of about 15 times the mass of the Sun is also possible, but only if the ULX produces more X-rays than predicted by current models of how matter falls into black holes. There is also evidence that the black hole in this system would have formed from a star surprisingly rich in metals (elements heavier than helium). High metallicity increases the rate of mass loss of massive stars, decreasing their mass before they collapse, thus decreasing the mass of the resulting black hole. Theoretical models suggest that with high metal content, only black holes with masses less than about 15 times that of the Sun should form. Therefore, these results may challenge these models.

The metallicity of the progenitor of this black hole, however, is not the only hypothesis for the surprisingly metal-rich environment of the black hole. It could be that the black hole is so old that it formed at a time when heavy elements were much less abundant in M83. Its environment would then have been seeded by later generations of supernovas. Another explanation, however, is that the mass of this black hole is only about 15 times that of the sun. It is therefore not impossible that the isodynamic conditions of space are satisfied because the mass of the star collapsing on itself at the galactic center is much smaller than usual.

The polar parametrization of anallagmatic spirals, for  $r > 0$  is  $r = a \exp \frac{t}{n}$  and  $n\theta = ch(t)$ .

Polar tangential angle:  $\tan \Psi = sh(t)$ .

Curvilinear abscissa:  $s = \frac{r}{2} \left( \frac{1}{n+1} \left( \frac{r}{a} \right)^n - \frac{1}{n-1} \left( \frac{a}{r} \right)^n \right)$  for  $n \neq 1$  and  $s = \frac{1}{4a} (r^2 + 2a^2 \ln(\frac{r}{a}))$  for  $n=1$  (coming from  $\frac{ds}{dr} = ach(t) = an\theta = \frac{a}{2} \left( \left( \frac{r}{a} \right)^n + \left( \frac{a}{r} \right)^n \right)$ ).

The anallagmatic spirals are the curves of polar equation given above.

As their name indicates, and as their equation shows, they are invariant by inversion (of pole O and power a).

The branch outside the inversion circle is asymptotic to the archimedean spiral of index  $1/n$  :  $\left( \frac{r}{a} \right)^n = 2n\theta$  (Fermat's spiral for  $n=1/2$ ) and the inner branch is asymptotic to the Archimedean spiral of index  $-1/n$  :  $\left( \frac{r}{a} \right)^{-n} = 2n\theta$  (Lituus spiral for  $n=-1/2$ ).

The anallagmatic spirals are the "wheels" associated with the rectilinear continuation curves (see with wheel/wheel pair).

More precisely, if we make the anallagmatic spiral of parameter  $n$  roll on the pursuit curve of parameter  $n$  (= speed of the master/speed of the dog), the pole of the spiral describes the asymptote (case  $n=1$ ) or the summit tangent (case  $n < 1$ ) of the pursuit curve.

The Ummites said to translate the equations of relativity with angular quantities, which we did, and by writing the ratio  $M/r$  (without negative mass influence) or  $M_{equi}/r_{equi}$  (with negative mass influence), we obtain vortex (Fermat) or Lituus spiral equations (with bars that do not emerge from the center of the galaxy). Barred spiral galaxies represent 50% of spiral galaxies, and therefore for these galaxies, there is a direct influence of the negative mass located in the twin universe near the border located at the level of the galactic bulb that collapses on itself. But precisely, when the negative mass is too imposing, it prevents the collapse and transfer of the positive mass in the twin universe because of the repulsive force between positive mass and negative mass, when the bars are parallel and stiff, as for the galaxy NGC 1300 for example, this means that the transfer of positive mass in negative mass in the twin universe is blocked because of mass  $M^-$  already present on the other side of the border, this corresponds to a blocked pipe, the transfer is blocked, the negative mass is not evacuated, it will eventually be evacuated over time because the repulsion between positive and negative mass will take place but the negative mass that will begin to be transferred and the negative mass on the other side of the border will stick, attract each other and therefore

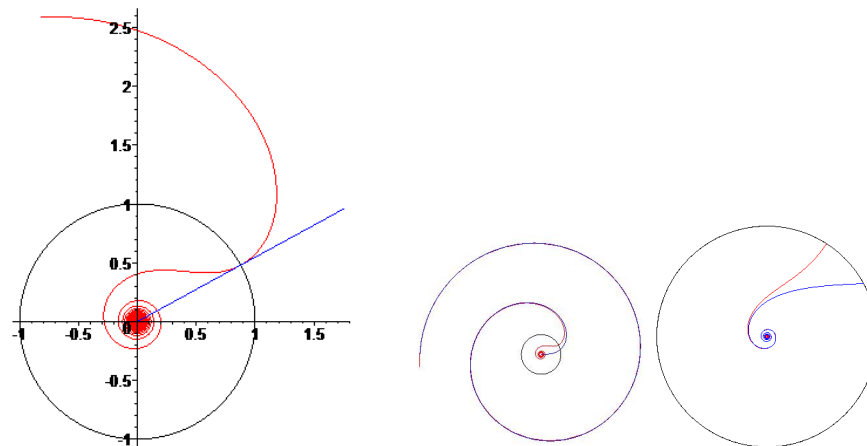


FIGURE 50E: Anallagmatic spiral, the blue tangent at the point of intersection with the inversion circle is the line  $\theta = \frac{1}{n}$  (left image). Here, plotted for  $n=2$ . The outer branch of the inversion circle is asymptotic to the archimedean spiral of index  $1/n$ :  $(\frac{r}{a})^n = 2n\theta$  (image of the center) and the inner branch is asymptotic to the archimedean spiral of index  $-1/n$ :  $(\frac{r}{a})^{-n} = 2n\theta$  (right image).

the border will be blocked. The gravitational waves responsible for the formation of arms in spiral galaxies will be stopped, which is why we observe little or no arms, but only two bars on each side. The shape of the galaxy will end up tending towards a Lituus spiral, when the central mass transfer will begin to take place, once the blocking negative mass is repelled by the Newtonian repulsion between two opposing masses, and so that the border will be clear. But it can take time if the negative mass is misplaced, the attraction between negative mass will take over and prevent the repulsion because the positive mass not transferred will be too small for the repulsion effect to be able to remove the negative mass blocking the passage, much like a baby that cannot exit through the uterus, In this case, a caesarean section must be performed.

This 2005 Hubble Space Telescope image shows the barred spiral galaxy NGC 1300. This type of galaxy corresponds to spiral galaxies whose spiral arms do not emerge from the center of the galaxy but from a bar made up of stars crossing this center.

Astronomers believe that two-thirds of spiral galaxies are barred. NGC 1300 is located approximately 61 million light-years from Earth in the constellation of Eridan. It was discovered by John Herschel in 1835. Data analysis suggests it is a young galaxy (FIGURE 50F).

A barred spiral galaxy is a spiral galaxy whose spiral arms do not emerge from the center of the galaxy, but from a band of stars crossing this center. - The spiral arms appear to emerge from the ends of the bar of these galaxies, while they appear to emerge directly. When these arms are stiff, and condensed, it means that the transfer that normally takes place at the center of the galaxies does not take place, it is blocked by the negative mass on the other side of the boundary between the two twin universes.

A barred spiral galaxy is a spiral galaxy whose spiral arms do not emerge from the bulge of the galaxy, but from a bar made of stars crossing this center. It is suspected that the Milky Way is a barred spiral galaxy.

In the classification of galaxies established by Edwin Hubble and known today as the Hubble



FIGURE 50F: NGC1300 galaxy. The transfer of the mass in the center is blocked by a BIG negative mass which is why the bar and arms are stiff and condensed, the non-transferred material accumulates in both arms, the spiral is incomplete because the  $\beta$  angle oscillates less than for the Lituus type spiral  $r = \frac{C}{\sqrt{\beta}}$  where  $\beta$  becomes a constant rather quickly (both arms=2 arcs of circles).

sequence, barred spiral galaxies are divided into four types:

- SBa, galaxies with arms tightly bound together (case where the transfer of mass to the center of the galaxy is completely blocked) ;
- SBc, galaxies with very weakly bound arms (mass transfer is starting to occur, galaxy in transition to a Lituus-type spiral) ;
- SBb, galaxies that fall between the two categories above;
- SBm, galaxies that designate irregular barred spirals, like the Magellanic Clouds.

The previous image was made using photographs taken by the Hubble Space Telescope in September 2004. It is one of the largest images made to date, measuring 4 feet by 8 feet (1.22 m by 2.44 m). The photos were taken through four filters by the Advanced Camera for Surveys (ACS) imager installed on the telescope: a violet filter centered at 435 nm, a green-yellow filter at 555 nm, an infrared filter at 814 nm, and the H-alpha filter at 658 nm to capture hydrogen light. The high resolution of the Hubble images allows us to see a multitude of details, some of which have never been observed before, in the arms, disk, bulge and nucleus of the galaxy. Blue and red supergiants, star clusters and pinkish star-forming regions can be seen. At the center of the galaxy, the nucleus of NGC 1300 has an extraordinary and distinct structure of a "grand style spiral galaxy". This spiral extends over about 3000 light-years. Only galaxies with a long central bar appear to have an inner disk with a spiral structure, a spiral within a spiral. Models show that the gas in the bar can be channeled to the center, take the shape of a spiral and eventually feed a black hole. However, NGC 1300 does not have an active core either because there is no black hole or because

little matter falls into the black hole there.

But according to a recent study, the central bulb of NGC 1300 would contain a supermassive black hole whose mass is estimated at  $7.3 \cdot 10^7$  solar masses. So this confirms for this type of galaxies, the mass transfer in the twin universe is blocked, the arms result from gravitational waves that were emitted before the appearance of the negative mass  $M^-$  which blocks the boundary that allows the mass transfer (positive mass of the galactic bulge that turns into negative mass in the twin universe).

NGC 1300 is the largest and brightest galaxy of a group of galaxies that bears its name. The group of NGC 1300 has at least 4 galaxies. The three other galaxies in the group are NGC 1297, PGC 12680 and ESO 549-512. The NGC 1300 group is part of the Eridan cluster.

The Eridan Cluster, sometimes called the Furnace Cluster II (Fornax II), is a cluster of galaxies located in the constellation Eridan, near the Furnace Cluster. Its center is about 75 million light years from Earth.

The cluster contains about 200 galaxies including 73 "main" galaxies. About 30% of them are of the elliptical or lenticular type and 70% of the spiral or irregular type. They are grouped in small clusters with little gravitational connection to each other. However, the low dispersion of velocities suggests that the cluster could be "tightening".

NGC 1300 has very stiff bars but the gas in the bar is channeled towards the center, so the material "falls" in the center, and "rises" because of the negative mass that blocks the mass transfer by Newtonian repulsion effect. There are no bursts of star formation unlike the galaxy NGC 1672 which has the Lituus spiral shape (FIGURE 50B).

A bursting star formation galaxy or a star formation galaxy is a galaxy with an exceptional rate of star formation compared to the rates observed in most galaxies. This phenomenon is limited in time and constitutes a stage in the life of a galaxy. It is inferred from the observations that the bursts of star formation in a galaxy are mainly the result of a collision, or interaction with one or more nearby galaxies. The rate of star formation in a starburst-undergoing galaxy is so great that, if the rate were maintained, the gas reservoirs at the origin of the stars would burn over much shorter periods than the dynamic life of the galaxy. For this reason, it is assumed that these bursts are temporary. Well-known starburst galaxies include M82, Antennae and IC 10.

But in fact, this burst of stars that does not last during the life of the galaxy results from alternating episodes of gravitational attraction between transferred negative masses, and episodes of repulsion between positive mass not transferred in the twin universe and negative mass located at the border in the twin universe. It is this alternation that allows the gradual transfer, little by little of the mass of the galactic bulb in the twin universe because the negative mass that blocks the mass transfer at the beginning (for example for the central bulb of NGC 1300) will be evacuated away from the border, gradually in successive stages, a bit like an unblocked pipe, and there will always be this alternation, that allow the transfer of positive mass to negative mass in the twin universe and the repulsive phase that caused collisions because the positive mass not transferred will return by saccades and collisions caused with the existing stars of the galaxy or other galaxies will generate this activity, the radius of the spherical bulb (coiled spiral of the Lituus in its center) will oscillate very quickly, so it is the angle to the denominator that will vary very significantly and give the form of reverse spiral  $r = \frac{C}{\sqrt{\theta}}$  with  $C = \text{constant}$ . The arms of the spiral galaxy NGC1300 will begin to be more diffuse, more varied as the mass transfer will grow, when the blocking negative mass will be removed from the boundary by gravitational repellents between a positive mass compacted, it will be sufficiently well positioned to repel the negative mass  $M^-$  which hinders the passage, but for NGC1300 this has not yet taken place, So we clearly distinguish very compact arms that correspond



to the transfer of the galactic bilbe mass in the twin universe. As the mass is not transferred, it will condense by gravittational attraction between positive masses, which will form very condensed arms.

Several definitions exist for starburst galaxies, although there is not one officially recognized by all astronomers. However, the majority agree that this definition is generally based on these three factors:

- the rate at which the galaxy converts gas into stars, in other words, the rate of star formation;
- the amount of gas available from which stars can form;
- the comparison between the period of formation of a star with the age or the period of rotation of the galaxy.

The most common definitions take into account the following factors:

- continued star formation at the current formation rate would deplete gas supplies in much less time than a Hubble time, as is often the case with a "true" starburst;
- continued star formation at the current formation rate would deplete gas reserves in much less time than the galaxy's dynamic age (perhaps the time of one rotation of the galactic disk);
- the rate of star formation, normalized using the average rate of the galaxy before the starburst, far exceeds unity. This ratio is called the birth rate parameter.

To engage a starburst, it is essentially necessary to concentrate a large amount of molecular gas in a small volume. Such concentrations and disturbances are most likely the cause of a global starburst phenomenon in most cases of galaxy fusion, although the exact mechanism is not yet well determined.

Observational data have long shown that there is often a burst of the star-forming disc in the merging pairs of galaxies. It is also believed that interactions between galaxies that do not necessarily merge can trigger unstable rotation modes that drive the gas to the galactic nucleus, causing bursts of star formation in this area.

In fact, these bursts are the result of matter not transferred into the twin universe, which was ejected from the frontier, it has not succeeded in being transferred because of the clogging of the border, which is the result of the first attraction between negative masses at the edges of the border on the other side, and the repulsion of a smaller positive mass but which will return and remain in the spiral galaxy to form stars by collision or interaction between positive masses.

Classifying the category of starbursts into different sub-categories is not easy because starburst galaxies have no common specificities. Star bursts can occur in the galactic disk, while irregular galaxies often show starburst "nodes" that are spread throughout the galaxy. However, some subtypes of starbursts are currently being discussed by astronomers:

- compact blue galaxies. These galaxies are often of low mass and low metallicity. In addition, they are dust-free and contain a large number of hot young stars. This implies that they are bright in blue and ultraviolet. It was originally thought that these types of galaxies were actually young galaxies forming their first generation of stars, which would explain the small

amount of metal they contained. However, old stellar populations have been found in most compact blue galaxies, and it is thought that this mixture may explain this apparent lack of dust and metal. Moreover, the majority of these galaxies show traces of recent interaction. Among the most studied compact blue galaxies are I Zwicky 18 (the most metal-poor galaxy ever discovered), ESO338-IG04, and Haro11;

- ultra-bright infrared galaxies. These objects are extremely dusty. The ultraviolet radiation emitted by the emerging stars is absorbed by the dust and re-emitted as infrared (100 micron wavelength). This explains among other things the red color of this type of galaxies. On the other hand, it is not certain that these UV rays are only emitted by the formation of stars and some astronomers think that these galaxies are powered (at least partially) by an active galactic nucleus. X-ray observations of many bright infrared galaxies suggest that many starbursts are dual-core systems, supporting the hypothesis that these galaxies are powered by star formation triggered by a major fusion. Among these galaxies, we will mention Arp 220;
- Wolf-Rayet galaxies. The majority of the bright stars in these galaxies are Wolf-Rayet stars.

First, a starburst galaxy must have a large reserve of gas in order to form stars. The jolt itself can be triggered by the approach of another galaxy (as is the case with M81/M82), by the collision with another galaxy (like the Antennae), or by the process described above attracting matter to the center of the galaxy (such as a stellar bar, of the Lituus type) which takes place when the transfer of matter alternates between phases where the positive mass is converted into a negative mass but the latter prevents subsequent positive masses from being converted in turn by repulsion, they will return to the outside of the centre, form a central bar by gravitational pull and "fall" back into the centre to be transferred. But this mechanism causes collisions responsible for starburst.

Inside a starburst is a rather extreme environment. Large amounts of gas mean that very massive stars form. These hot young stars ionize the gas (mostly hydrogen) around them, creating HII regions. Very hot star groups are OB associations. These very bright stars will probably end their lives as supernovae.

After the supernova explodes, the ejected material expands, becoming supernova remnants. These remnants interact with the interstellar medium and can thus generate natural masers.

Studying nearby starburst galaxies can help us learn more about the history of formation and the evolution of the galaxy. A large number of distant galaxies observed (in the Hubble deep field, for example) are starburst-like, but are too far apart for further study. The observation of close examples and the extrapolation of their characteristics can give an idea of what was happening in the Universe when it was younger, as the light that comes to us from these galaxies predates the present moment (see redshift). However, starburst galaxies seem to be rare in the local universe, and more common in more distant areas—indicating that there were several, 1 billion years ago. All galaxies were indeed closer, and therefore more prone to gravitational interactions.

In astronomy, the galactic bulb is the central part of the spiral galaxies, located in the disk and surrounding the galactic nucleus. It is a bright and relatively dense area composed generally of old stars rich in metals, but sometimes of young stars in formation. The very first stars, formed outside the disc, are those found today in the halo and in the bulb.

Due to the large number of stars it contains, the galactic bulb is a region with star-forming bursts that is rapidly enriched with chemical elements. It also contains in its heart a supermassive black hole. The term "black hole" refers to a transfer tunnel when in fact it is a transition frontier

between positive mass located in the universe of matter and negative mass located in the universe of antimatter; Young stars are stars the result of collision between stars whose mass could not go into the twin universe.

In terms of size, in the majority of cases, the mass of the bulb of a galaxy is about a thousand times larger than that of the supermassive black hole in its centre. This proportion generally remains the same, regardless of the age or size of the galaxy studied. However, this has not always been the case, as studies by astrophysic

ist Chris Carilli using the Very Large Array (VLA) radio telescopes and the Institute of Millimeter Radioastronomy (IRAM) Bure Plateau interferometer have shown. These studies, looking at the size of galaxies during the first billion years of the Universe, have highlighted the fact that at that time, black holes had a mass far greater than their galactic bulb, to conclude that the black holes would have formed before the galactic bulbs.

The new generation of millimeter radio telescopes, such as the Very Large Array or the Atacama Large Millimeter Array (ALMA), should be able to pinpoint the links between the growth of galactic black holes and their bulbs.

The Hubble sequence uses bulbs to classify galaxies. Spiral galaxies are classified from a to c according to the number of spiral arms, and the relative importance of their bulb relative to the disc. The Sc Type of spiral galaxy corresponds to a small central bulb. Our galaxy, the Milky Way, seems to have a bulb type b.

Galactic bulbs with properties similar to elliptical galaxies are often referred to as 'classic bulbs'. These bulbs are redder than the disk of the galaxy. The star components are mainly old population stars II (see stellar evolution). They have random orbits relative to the plane of the galaxy, hence the relatively spherical shape of the bulbs. In addition, galactic bulbs have very little gas and dust compared to the disc, which is why there are few young stars in the bulbs. The distribution of light within the galaxy is well described by the law of Vaucouleurs.

In the bulb of our galaxy and the galaxy of Andromeda, we observe stars and star clusters up to eight times richer in heavy elements than the Sun.

It is these characteristics that lead many astronomers to conclude that the so-called «classic» bulbs are the result of galactic fusion. The galactic bulbs would therefore be the product of the collision of smaller structures. The impact, of great violence, would disrupt the normal progression of stars in space, resulting in random orbits characterizing the stars composing the galactic bulbs. Moreover, during the fusion of the two groups of stars, the gas clouds would tend to collapse on themselves because of the strong energy released by the fusion of the two masses, forming young stars, which would explain the small amount of gas and dust found inside galactic bulbs. A bulb can also be the result of a series of collisions, but these bulbs are often older collisions of galaxies that have been more frequent in the past of the Universe. Thus, nowadays, the majority of classic bulbs have not changed significantly in the last ten billion years.

Gases and stars not involved in the collision may have formed the outer disk of the galaxy by organizing themselves around the central bulb. Although the solar system is located inside the galaxy and its exterior observation is impossible, various methods of investigation, including that used by William Herschel at the end of the 18th century, determined the position of the galactic center in the constellation of Sagittarius. Telescope observations of many other spiral galaxies have estimated the shape of our galaxy and the position of the central ellipsoidal bulb, which is thought to be between 7,000 and 15,000 light-years in diameter. The Milky Way bulb contains about 5% of the visible matter (compared to 90% in the disc and 5% in the halo).

The bulb of the Milky Way is shaped like a cross.

As we have seen previously the bulb has a mass corresponding to several million solar masses, the gravitational attraction that reigns there and considerable and yet the mass seems not to fall to the bottom of the "supermassive black hole"  $\times 1000$  located in the center of the galaxy NGC 1300. This confirms the existence of a blocking object on the other side. In addition, physicists have lost half of the universe. They don't know where the antimatter went. The Big Bang should have created as much antimatter as matter in the primordial universe. Yet today, everything we perceive, from the smallest terrestrial life form to the largest stellar objects, is almost entirely matter. Comparatively, there is not much antimatter to observe. Something probably tipped the scales. One of the greatest challenges in physics is to determine what happened to the antimatter, or in other words, to explain the asymmetry between matter and antimatter.

Antimatter particles have the same mass as their matter counterparts, but opposite characteristics, including electric charge. Thus, the positron, positively charged, is the antiparticle of the electron, negatively charged. Matter and antimatter particles are always produced in pairs and, when they come into contact with each other, they annihilate each other, leaving behind only pure energy. In the first fractions of a second after the Big Bang, the hot, dense Universe was in a state of flux: particle-antiparticle pairs were constantly appearing and disappearing. If matter and antimatter are created and destroyed together, the Universe should contain only residual energy.

Nevertheless, a tiny fraction of the matter - about one particle in a billion - managed to survive. This is the matter we observe today. Over the past few decades, particle physics experiments have shown that the laws of nature do not apply equally to matter and antimatter. Physicists would like to find out why. Researchers have observed that a particle and an antiparticle spontaneously transform into each other millions of times per second before disintegrating. Because of the intervention of a still unknown factor during this process in the primordial Universe, the oscillating particles could have disintegrated more often in the form of matter than antimatter.

Imagine a coin spinning like a top on a table. It can fall on either the heads or the tails side, but no one can determine what will happen until it falls again. The probability of the coin falling on one side is 50%. So, if enough coins are flipped without favoring one side, half of them should fall on the heads side and half on the tails side. Similarly, half of the oscillating particles in the primordial universe should have decayed into matter, and the other half into antimatter.

But let's imagine that we roll a special marble on the table which would make all the pieces fall on the face side; the system would then be completely disturbed. There would be more heads than tails. Also, an unknown mechanism could have interfered with the oscillating particles, so that a slight majority of them would disintegrate into matter. Physicists hope to get a glimpse of an explanation by studying the subtle differences in the behavior of matter and antimatter particles created in high-energy proton-proton collisions at the LHC. This study could allow them to better understand why our universe is filled with matter.

The Hubble Space Telescope observations have clouded the map. Indeed, the new measures they have allowed imply that galaxies would be younger than the stars they contain! How to solve such a dilemma? if some argue for a hypothetical "repulsive power of emptiness", others envisage the cohabitation of two universes, ours and a "shadow universe". The galaxies would be lodged in the holes of an invisible Swiss cheese, constituted of "dark matter" which would prevent them from bursting under the effect of centrifugal force. The interaction between these two universes explains the spiral structure of galaxies (Equation Spirale de Fermat, spirale Lituus ou spirale anallagmatique) and the origin of the famous quasars, which would predict a turbulent cosmic expansion.

A quasar (quasi-stellar radiation source, quasi-stellar radiosource, or more recently "quasi-stellar

astronomical radiation source”, quasi-stellar astronomical radiosource) is an extremely bright supermassive black hole (active nucleus). Quasars are the brightest entities in the Universe. Although there was initially some controversy over the nature of these objects until the early 1980s, there is now a scientific consensus that a quasar is the compact area surrounding a supermassive black hole in the centre of a massive galaxy. Their size is 10 to 10,000 times the Schwarzschild radius of the black hole and their energy source comes from the surrounding accretion disk.

Through optical telescopes, most quasars look like small points of light, although some are seen as the centers of active galaxies (and abbreviated AGN, for Active Galaxy Nucleus). Most quasars are far too far away to be seen with small telescopes, but 3C 273, with an apparent (or relative) magnitude of 12.9 and 2.44 billion light-years away, is an exception.

Some quasars show rapid changes in brightness, which implies that they are quite small (an object can't change faster than the time it takes in the light to travel from one end to the other). The quasar ULAS J1120+0641, observed in 20112, has long remained the furthest ever observed, at  $z = 7.09$  (so about 12.9 billion light-years from Earth). At the end of 2017, the observation of quasar ULAS J1342+0928, at  $z = 7.54$ , is announced; this quasar has a bolometric brightness of  $4.10^{14}$  x solar brightness and is interpreted as a black hole whose mass corresponds to  $8.10^8$  solar masses. Quasars are thought to be gaining power through the accretion of matter around the supermassive black holes in the nucleus of these galaxies, making “light versions” of these objects known as active galaxies. No other mechanism seems capable of explaining the immense energy released and their rapid variability.

A phenomenon still unexplained to this day around quasars is that some “relatively quiet” galaxies suddenly become active quasars in just a few months. A quasar consists of three main parts:

- the supermassive black hole comprising almost all the mass of the quasar (from a few million to a few tens of billions of times the mass of the Sun). It is also the center of the quasar;
- the accretion disc is the disc formed by the material falling into the black hole. The friction force generated by the friction of the gases in the disc generates a strong heat;
- gas jets that are expelled from the accretion disk by the black hole magnetic field lines reach a speed close to that of light.

The largest catalogue in 2006 lists 113,666 quasars. All observed spectra show shifts towards red ranging from 0.06 to 6.4 indicating according to Karlsson's law that they are at very great distances from us, the closest to us being at about 240 Mpc (783 million light-years (ly)) and the furthest being at about 4 Gpc (13 billion ly), at the limits of the observable universe.

Although weak when viewed optically (their shift to high red implies that these objects move away from us) quasars are the brightest objects known in the Universe[ref. Desired]. The quasar that appears the most brilliant in our sky is the hyper-luminous 3C 273, in the constellation of the Virgin. It has an apparent magnitude of about 12.9 (bright enough to be seen with a small telescope) but its absolute magnitude is 26.7. This means that at a distance of 10 pc ( 33 light years), this object would shine in the sky as strongly as the Sun. The brightness of this quasar is 2,1012 times higher than that of the Sun, or about 100 times higher than the total light of a giant galaxy, such as our Milky Way.

The super-bright quasar APM 08279+5255 was discovered in 1998 with an absolute magnitude of 32.2, although high-resolution images from the Hubble and Keck telescopes reveal that the system is gravitationally enlarged. A study of the gravitational magnification in this system suggests that

it was magnified by a factor of about 10. This is even brighter than nearby quasars such as 3C 273. It was thought that HS 1946+7658 had an absolute magnitude of 30.3, but it too was enhanced by the gravitational magnification effect.

Quasars were found to vary in brightness over different time scales. Some vary in brilliance every x months, weeks, days or hours. This discovery allowed scientists to theorize that quasars generate and emit their energy in a small region, since each part of quasar must be in contact with other parts on a time scale to coordinate variations in brightness. Thus, a quasar whose brightness varies on a time scale of a few weeks can only be larger than a few light weeks.

Quasars show many properties comparable to those of active galaxies: the radiation is non-thermal and some have jets and lobes like those of radiogalaxies. Quasars can be observed in many areas of the electromagnetic spectrum: radio waves, infrared, visible light, ultraviolet, X-rays and even gamma rays.

Most quasars are the brightest in the near ultraviolet range (121.6 nanometres, which corresponds to the Lyman- $\alpha$  hydrogen emission line) in their own reference frame, but because of the considerable red shifts in these sources, the peak of brightness was observed as far as 900 nanometers, in the very near infrared.

Iron quasars show very strong emission lines resulting from ionized iron, such as IRAS 18508-7815. As quasars show properties common to all active galaxies, many scientists have compared quasar emissions to those of small active galaxies. The best explanation for quasars is that they become powerful thanks to supermassive black holes. To create a brightness of  $10^{40}$  W (the typical brightness of a quasar), a supermassive black hole should consume the equivalent matter of 10 stars per year. The brightest quasars are known to devour 1,000 solar masses of matter per year. Quasars are known to light up or down depending on their environment. One consequence would be that a quasar could not, for example, continue to feed at this rate for 10 billion years. Which would explain why there's no quasar near us. When a quasar has finished swallowing gas and dust, it would become an ordinary galaxy.

The quasars also provide clues as to the end of the reionisation of the Big Bang. The oldest quasars ( $z > 4$ ) show a Gunn-Peterson wave and absorption regions in front of them, indicating that the intergalactic medium was neutral gas at that time. More recent quasars show that they have no absorption regions but rather spectra containing an area with a peak known as the Lyman- $\alpha$  forest. This indicates that intergalactic space has undergone reionization in plasma, and that neutral gas exists only in the form of small clouds.

Another interesting feature of quasars is that they show traces of elements heavier than helium. This indicates that these galaxies underwent an important phase of star formation creating a star population III, between the time of the Big Bang and the observation of the first quasars. The light of these stars was observed thanks to NASA's Spitzer Space Telescope (although at the end of 2005 this interpretation still needs to be confirmed).

The first quasars were discovered with radio telescopes in the late 1950s. Many were recorded as radio sources with no associated visible object. Using small telescopes and the Lovell telescope as interferometer, we noticed that they had a very small angular size. Hundreds of these items have been listed since 1960 and listed in the Third Cambridge Catalogue. In 1960, the 3C 48 radio source was finally connected to an optical object. Astronomers detected what appeared to be a pale blue star at the radio sources and obtained its spectrum. Containing an enormous number of unknown emission lines — the irregular spectrum defied any interpretation — John Bolton's claim of a large red shift was not accepted.

In 1962, a breakthrough was made. Another radio source, 3C 273, was about to undergo five

occultations by the Moon. The measurements made by Cyril Hazard and John Bolton during one of the occultations using the Parkes radio telescope enabled Maarten Schmidt to identify the object from the optical point of view. He obtained an optical spectrum using the Hale telescope (5.08 m) on Mount Palomar. This spectrum revealed the same strange emission lines. Schmidt realized that these were the lines of hydrogen redshifted (shifted to red) by 15.8%! This discovery demonstrated that 3C 273 was moving away at a speed of 47 000 km/s. This discovery revolutionized the observation of quasars and allowed other astronomers to find redshifts emanating from emission lines and from other radio sources. As Bolton predicted earlier, 3C 48 turned out to have a red offset equivalent to 37% of the speed of light.

The word "quasar" was coined by astrophysicist Hong-Yee Chiu in the journal *Physics Today*, to designate these intriguing objects that became popular soon after their discovery, but which were then referred to by their full name (quasi-stellar radio source):

"For now, the rather clumsy and indeterminable word "quasi-stellar radio source" is used to describe these objects. As the nature of these objects is completely unknown to us, it is difficult to give them a short and appropriate nomenclature, even if their essential properties come from their name. In practical terms, the short form "quasar" will be used throughout this section." — Hong-Yee Chiu, *Physics Today*, May 1964

Later, it was discovered that some quasars (in fact only 10%) did not have strong radio broadcasts. Hence, the name "QSO" (quasi-stellar object<sup>25</sup>) used (in addition to the word "quasar") in reference to these objects, including the class of radio-strong and radio-silent.

The main topic of debate in the 1960s was whether quasars were near or far objects as their redshift implies. It was suggested, for example, that the redshift of the quasars was not due to the Doppler effect, but rather to light escaping from a deep gravitational well. However, a star with enough mass to form such a well would be unstable. The quasars also show unusual spectral lines, previously visible on a low-density hot nebula, which would be too diffuse to generate the observed energy and to access the deep gravitational well. There were also serious concerns about the idea of distant cosmological quasars. One of the main arguments against them was that they involved energies that exceeded known conversion processes, including nuclear fusion.

These objections were erased with the proposal of an accretion disk mechanism, in the 1970s. And today, the cosmological distance of quasars is accepted by the majority of researchers.

In 1979, the gravitational lens effect predicted by Einstein's theory of general relativity was confirmed by the observation of the first images of the double quasar 0957+561.

In the 1980s, unified models were developed in which quasars were seen simply as a class of active galaxies, and a general consensus emerged: in many cases, it is only the angle of view that distinguishes them from other classes, such as blazars and radiogalaxies. The immense brightness of the quasars would be the result of friction caused by gas and dust falling in the accretion disc of supermassive black holes, which can transform into energy of the order of 10% of the mass of an object (compared to 0.7% for the energy produced during the p-p process of nuclear fusion which dominates the production of energy in stars such as the Sun).

This mechanism also explains why quasars were more common when the Universe was younger, such as the fact that this energy production ends when the supermassive black hole consumes all the gases and dust in its vicinity. This implies the possibility that most galaxies, including our Milky Way, may have passed through an active stage (appearing as quasars or another class of active galaxy depending on the mass of the black hole and its accretion disk) and are now peaceful because they no longer have enough food (in the middle of their black hole) to generate radiation. Quasars, pulsars and neutron stars are structurally quite similar, their main difference being the

angle from which we observe them. Radio astronomy has made it possible to discover celestial objects that were previously unsuspected; this is the case of quasars. About fifty years ago, researchers who were beginning to analyze radio frequencies discovered powerful sources located on precise points of the sky. They deduced that these emissions came from stars or galaxies and were dissociated from the diffuse radio waves coming from all parts of the sky. Not knowing yet the exact nature of these objects, they gave them the name of quasar, which is a contraction of the term "quasi-stellar" or literally "quasi-star". Once these objects were located, physicists were able to analyze their spectrum. They discovered to their amazement that the spectral lines did not correspond to any known chemical element. They then began to doubt that these objects could be mere stars. It was not until the early 1960s that a Dutch researcher, Maarten Schmidt, discovered the answer to this enigma. The quasars being located at enormous distances, their respective spectra were shifted towards the red. The brightest lines found on the spectrographs of quasars were in fact the lines of hydrogen which were usually located near the ultraviolet and that one found here in the visible spectrum. Today there are about 20,000 quasars with these characteristics. Astronomers Walter Baade and Fritz Zwicky had theorized about neutron stars in the late 1930s, but it was not until the late 1960s that Jocelyn Bell and his professor Anthony Hewish discovered a radio source that emitted signals whose intensity varied with great regularity. Other radio astronomers soon discovered new sources whose signals varied according to periods ranging from a few milliseconds to a few seconds. The relative precision of these pulses was astonishing, it was close to one thousandth of a billionth. The sources of these signals were called pulsars. There are currently several hundred of them. Once again the question of their nature arose, even more enigmatic than for the quasars. The hypothesis of extraterrestrial civilizations and that of parasitic sources was even considered, but researchers thought it more likely that it could be a body in very rapid rotation. However, the extremely short periods that were recorded could only come from very small objects. Indeed, a large object would have broken up if it had been animated by such a speed of rotation. It is then that neutron stars came back into the picture, because their tiny size could have justified simultaneously their rotation speed and the presence of very intense electric and magnetic fields.

Astrophysicists then began to determine what the physical characteristics of such objects might be. They found huge masses ranging in size from several million kilometers in diameter to only a few kilometers, which caused totally gigantic density levels. The magnetic fluxes of such stars remaining constant during the collapse of the latter on themselves, the intensity of these fluxes increased until reaching values reaching a thousand billion times that of the Earth's magnetic field. All these phenomena give rise to a radiation called synchrotron, which sweeps a part of the sky in the form of a cone. It is when the earth is in this regularly swept area, that it receives a radio pulse that gives rise to the pulsar phenomenon. The nature of this cone suggests that the Earth can only receive a small part of the emissions present in the Universe. Thus, researchers have been able to estimate the number of these stars to several hundred million in our galaxy alone.

A pulsar belongs to the family of neutron stars. It is a very special celestial object: instead of shining continuously like a normal planet or star, it periodically sends very brief pulses of radiation into space. In general, a pulsar emits its light in a regular way.

A pulsar is an astronomical object producing a periodic signal ranging from a millisecond to a few tens of seconds. It would be a neutron star rotating very rapidly on itself (typical period of the order of a second, or even much less for millisecond pulsars) and emitting a strong electromagnetic radiation in the direction of its magnetic axis.

The neologism "pulsar" was first attributed to the American astronomer and astrophysicist Frank



Drake who would have proposed it in April 1968, but it turns out that it appeared earlier, the first time in an interview with the British astronomer Antony Hewish published in *The Daily Telegraph* on March 5, 1968.

This word comes from the fact that, at the time of their discovery, these objects were initially interpreted as being variable stars subject to very rapid pulsations. This hypothesis was soon proven incorrect, but the name remained.

Graph on which Jocelyn Bell Burnell first recognized the presence of a pulsar (later designated PSR B1919+21), on display in the Cambridge University Library.

Visible/X-ray composite image of the Crab pulsar, born of the historic supernova SN 1054, showing the surrounding gas of the nebula agitated by the magnetic field and radiation of the pulsar. NASA image.

The magnetic axis of a neutron star is generally not perfectly aligned with its axis of rotation, as is the case for the Earth. The region of emission corresponds at a given time to a beam, which sweeps over time a cone due to the rotation of the star. A pulsar is signaled to a distant observer as a periodic signal, the period corresponding to the rotation period of the star. This signal is extremely stable, because the rotation of the star is also stable, however it slows down very slightly over time. Pulsars result from the explosion of a massive star at the end of its life, a phenomenon called supernova (more precisely core-collapse supernova, the other class of supernovas, thermonuclear supernovas leaving no compact residue behind). Not all core-collapse supernovas give rise to pulsars, some leaving behind a black hole. While a neutron star has a virtually infinite lifetime, the characteristic emission phenomenon of a pulsar usually only occurs for a few million years, after which it becomes too faint to be detectable with current technologies.

Pulsars were discovered somewhat by accident in 1967 by Jocelyn Bell (now Jocelyn Bell-Burnell) and his thesis advisor Antony Hewish<sup>11,12</sup>. In the Cavendish laboratory of the University of Cambridge, they were studying refractive scintillation phenomena in the radio domain and therefore needed an instrument that measured variations in a radio signal over short periods (a fraction of a second). The instrument allowed the detection of the periodic variation of objects that were jokingly considered for a while as sources of communication signals from an extraterrestrial intelligence, but turned out to be pulsars, the first of them bearing the name PSR B1919+21 (or CP 1919 at the time). Seven years later, the Nobel Prize in Physics, the first Nobel Prize for astronomical research, was awarded to Hewish and his collaborator Martin Ryle for their pioneering work in the field of radioastrophysics. Although the Nobel Foundation emphasized the decisive role of Hewish in the discovery of pulsars, it did not recognize Jocelyn Bell as co-discoverer of the new astronomical object. A part of the astronomical community believed that Bell had only reported, in her thesis work, on a phenomenon that she had not understood. Other scientists, including Fred Hoyle, expressed their indignation at what they considered to be an injustice.

The discovery of pulsars has led to important developments in many disciplines of astrophysics, from tests of general relativity and condensed matter physics to the study of the structure of the Milky Way, and of course to supernovas. The study of a binary pulsar, PSR B1913+16, has for the first time allowed to demonstrate the reality of the gravitational radiation predicted by general relativity, and has also been awarded the Nobel Prize in Physics (Russell Alan Hulse and Joseph Hooton Taylor, in 1993).

Because the emission of a pulsar is confined to a cone, a large number of pulsars are unobservable from the Earth, because it is not in the cone swept by the beam of many pulsars. Nevertheless, more than 2000 pulsars are known at the present time (2007), almost all of them being located in the Milky Way or some of its globular clusters, the others, very few, being located in the two

Magellanic Clouds. Even a pulsar as energetic as the most energetic known pulsar (the Crab pulsar, also called PSR B0531+21) would be a priori undetectable if observed from the Andromeda galaxy (M31), so the Milky Way and the Magellanic Clouds are the only galaxies where it seems feasible to study these objects with current technologies.

There is a large variety of pulsar types (radio pulsars, X-ray pulsars, anomalous X-ray pulsars, magnetars, millisecond pulsars), whose properties depend essentially on their age and their environment.

- Radio pulsars represent the bulk of the observed population of pulsars. They are objects detected in the radio wave domain by their pulsed emission. Their detection is the object of particular techniques, the pulsed character of the emission being relatively difficult to put in evidence, except specific properties of some of these pulsars (giant pulses in particular). Paradoxically, the precise physical process that explains the intense radio emission of these objects is not well known... which does not prevent the study of these objects through it.
- X-ray pulsars emit in the X-ray range, a characteristic that groups several distinct phenomena. This X-ray emission is generally not due to the emission of their surface, however very hot (several million kelvins, or even much more), but is produced outside of it by energetic processes resulting from the fast rotation of the neutron star. Another possibility is that it is due to the release of very intense energy caused by matter crashing on their surface and heated during its fall on it. Such pulsars are located in a binary system in which they orbit with a companion that is an ordinary star. If the X-ray emission of this type of object is in this case very easy to observe (the energy thus radiated is considerable, of the order of  $10^{31}$  watts, that is to say several tens of thousands of solar luminosities), its pulsed character is on the other hand much more difficult to highlight, to the point that various sources of this type (called for obvious reasons X binaries) are not identifiable as X-ray pulsars.
- Gamma-ray pulsars are, as their name indicates, pulsars emitting in the gamma-ray range. When these objects are not part of a binary system, their gamma-ray emission is rare (or at least difficult to detect): only 7 gamma-ray pulsars are known at the beginning of 2008, before the launch of the Fermi satellite (in 2013 more than a hundred). Except for the pulsars present in binary systems, almost all X-ray and gamma-ray pulsars are also radio pulsars. The only (notable) exception to this rule is PSR J0633+1746, better known as Geminga, which paradoxically is one of the most powerful gamma-ray sources in the sky, but which remains completely undetectable in radio.
- Abnormal X-ray pulsars are, as their name indicates, X-ray pulsars whose emission is "abnormal", in this case, higher than the maximum emission that these objects should have a priori. They are the sign that another physical process, poorly identified to date, gives them an important energy.
- Magnetars are pulsars with extremely high magnetic fields (up to  $10^{11}$  teslas). Such objects are probably very young. It is not well established if these objects are intrinsically rare or if they represent a brief but normal transient state of a pulsar's life.
- Millisecond pulsars are very old pulsars, with a very weak magnetic field (for a pulsar, still on the order of  $10^4$  teslas) but a very high rotation speed. These pulsars are often in orbit

around a companion, usually a star or a white dwarf. The presence of this companion seems to play a crucial role in the formation of these objects.

The pulsars were discovered in 1967 by Jocelyn Bell and Antony Hewish in Cambridge when they used a radio telescope to study the scintillation of quasars. They found a very regular signal, consisting of short pulses of radiation repeating very regularly (the period of 1,337,301,192 seconds being subsequently measured with very high precision). The very regular appearance of the signal argued for an artificial origin, but an earthly origin was excluded because the time it took to reappear was a sidereal day and not a solar day, indicating a fixed position on the celestial sphere, Impossible thing for an artificial satellite.

This new object was named CP 1919 for «Cambridge Pulsar at 19 h right ascension» and is today named PSR B1919+21 for «Pulsar at 19 h right ascension and +21° declination». Jean-Pierre Luminet says that “when these extraordinary objects were discovered in 1967, some astronomers at first believed that they were artificial signals emitted by extraterrestrial intelligences, because the regularity of the pulsation seemed supernatural.” The first pulsar was named “LGM-1”—and so on for LGM-2, etc.—for Little Green Men-1 (litt. “little green men-1”). After much speculation, it was accepted that the only natural object that could be responsible for this signal was a fast-rotating neutron star. These objects had not yet been observed at the time, but their existence as a result of the explosion of a massive star at the end of its life was hardly in doubt. The discovery of pulsar PSR B0531+21 in the Crab Nebula (M1), a result of the historic supernova SN 1054, abundantly described by astronomers in the Far East (China, Japan) completed the identification of pulsars and neutron stars.

The population of pulsars is gradually enriched by new objects, some of which had atypical properties. Thus, the first binary pulsar, that is to say part of a binary system was discovered in 1974. It possessed the remarkable property of having as companion another neutron star, forming with it a binary system in extremely close orbit, to the point that the universal gravitation does not allow to explain the details of the orbit of the pulsar, revealed by the modulations of the arrival times of the pulsed emission of these objects. The high accuracy of the measurements allowed astronomers to calculate the loss of orbital energy of this system, which is attributed to the emission of gravitational waves. An even more remarkable system was discovered in 2004, the dual pulsar PSR J0737-3039. This system consists of two neutron stars, both seen as pulsars. They form the system with the tightest neutron star known to date, with an orbital period of about two hours. Even more remarkable, the tilt of this system is very low (the system is almost seen in its orbital plane), to the point that an eclipse phenomenon occurs for a few tens of seconds during the revolution of the system. This eclipse is not due to the masking of the background pulsar by the surface of the foreground, but to the fact that the pulsars are surrounded by a strongly magnetized region, the magnetosphere, where complex electromagnetic phenomena occur. This magnetosphere is likely to prevent the propagation of background pulsar radiation, providing a unique opportunity to study the magnetosphere structure of these objects.

In the 1980s, we discovered millisecond pulsars, which, as the name suggests, have periods of a few milliseconds (typically between 2 and 5). Since 1982, the PSR B1937+21 has had the highest rotation frequency. Its rotation frequency was 642 Hz. During the month of January 2006, a publication reported the detection of a pulsar called PSR J1748-2446ad (or Ter5ad to make it shorter, the pulsar being located within the globular cluster Terzan 5 (en)) and having a rotation frequency of 716 Hz. The search for pulsars at the fastest rotation is of high interest for the study of these objects. Indeed, their maximum rotation period is directly related to their size: the smaller their size, the higher their maximum rotation speed can be, This is because the speed of rotation

of an object is limited by the fact that the centrifugal force cannot exceed the gravitational force, otherwise the object would spontaneously lose the mass located in its equatorial regions. The centrifugal force of equatorial regions increases with the size of the object, while its surface gravity decreases. A very fast rotating object is thus a sign of an intrinsically small object, which can be used to fix its internal structure, a very small neutron star being a sign not of a small object, but of a very compact object.

The pulsar signals pass through a curved space-time and arrive on Earth with great regularity. During the passage of a gravitational wave, the space-time is disturbed and induces an oscillation between advance and delay for the arrival time of the signals of each pulsar.

Quasars are distant stars, which appear like very bright stars when viewed through a telescope, but which we now know are examples of what are called active nuclei of galaxies (Active Galactic Nuclei or AGN), which are not necessarily as bright.

Astronomers specializing in quasars do not understand that some "relatively quiet" galaxies suddenly become active quasars in just a few months, which is characteristic of active galaxy nuclei. It is the influence of the negative mass located on the other side of the boundary which gives this relatively peaceful aspect, but when the positive mass accretes on the other side of the boundary so that it has about the same numerical value as the negative mass located in the twin universe, then the phenomenon of repulsion according to Newton's law between two opposite masses explodes the whole and generates gravitational waves characteristic of these objects (pulsars, quasars,...), the boundary (erroneous term of black hole) is then freed from any obstacle and thus the transfer of positive mass resumes and that is why we obtain an active quasar in a few months, because the expulsion of the negative mass which blocks the transfer is very fast, it is enough that there is the same positive/negative mass on each side; on the other hand, these conditions can take much longer because if there is an imbalance between positive and negative mass on each side of the boundary, then the galaxy remains a barred spiral galaxy with "stiff" arms and bars; these changes are noisy and disconcert the specialists, but in fact as the Ummites suggest the structure of the universe can be explained by the tetravalent logic; which allows to superimpose the 2 states (twin universe which does not exist and twin universe which exists); in the present case, the twin universe exists: the negative mass blocks the transfer of the galactic bulb; the neutron star at the end of its life which collapses on itself is about to transfer the positive mass but it is pushed back by the much more important negative mass then in this case it remains near the border, but prevents any transfer of mass in the twin universe. , but when the positive mass grows by accumulation of matter at the level of the galactic bulb (in the shape of a box), the positive mass returns to the level of the negative mass and the repulsion takes place, the quasar becomes active and emits an impressive quantity of radiation, the galactic bulb becomes active, the negative mass moves away from the frontier so that the transfer of mass occurs normally, and thus the twin universe does not exist (or more). And so if we superimpose these 2 states, we arrive at a detailed description of the activity of the galactic bulge which alternates between:

- STATE 1: TWIN UNIVERSE HAS ZERO MASS; there is a repulsion between negative mass and positive mass of the same order at the border between the two universes; Newton's law of repulsion applies at the border, which marks the rapid return of the activity of the galactic bulb that was blocked by the negative mass. The latter no longer exists, expelled by the repulsion with a positive mass of the same order. The transfer of mass (positive to negative) in the twin universe resumes; there is no disturbance of negative mass near the boundary, The quasar, the neutron star at the end of life emits radiation with a transition state: the

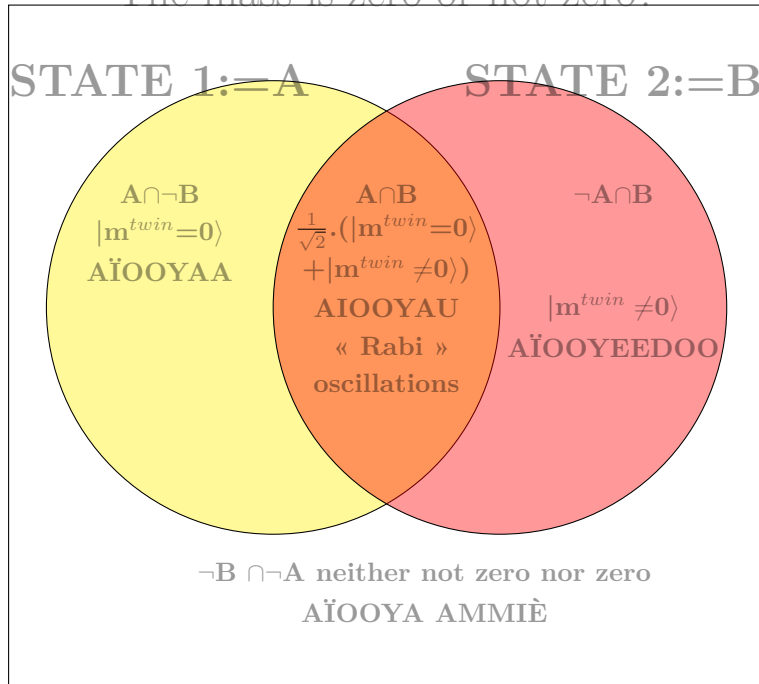
positive mass becomes negative.  $M^-$  is zero, in other words the mass of the twin universe is zero for an outside observer.

- STATE 2: TWIN UNIVERSE HAS NON-ZERO MASS; In this case the negative mass is too important to be expelled by the repulsion of the positive mass about to be transferred, a "weak" positive mass can be transferred but it comes to stick to the negative mass by attraction between negative masses. The supermassive black hole may have several million times the density of a classical black hole, but the matter does not fall into it, as it is the case for the galactic center.  $M^-$  is non-zero, in other words the mass of the twin universe is non-zero for an outside observer.

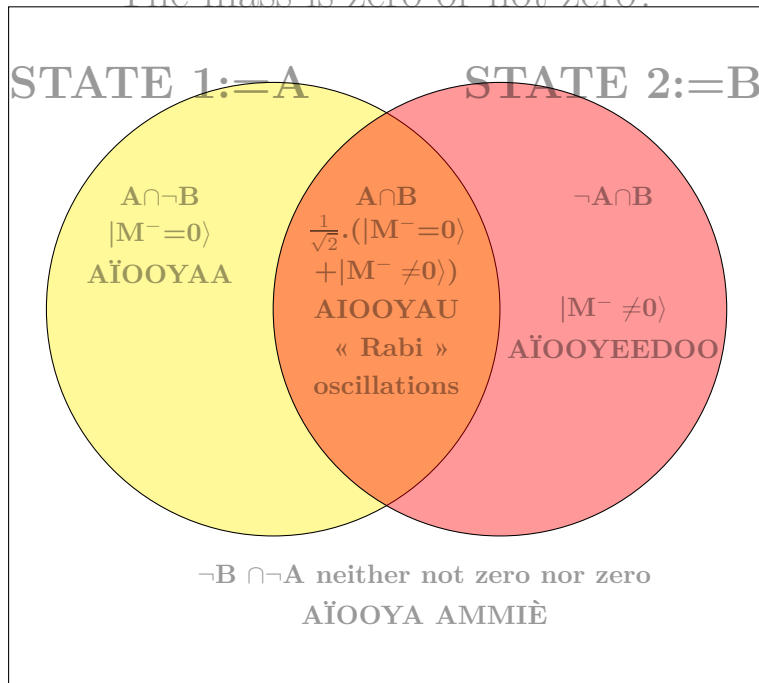
As these two states can be superimposed exactly as in quantum mechanics, this is why some "relatively quiet" galaxies suddenly become active quasars, in just a few months. Astronomers do not understand why, they are baffled because they do not apply the tetravalent logic to celestial objects. The internal angles of the mass can be 0 or  $2k\pi$  simultaneously, and thus the negative mass will be zero and not zero.

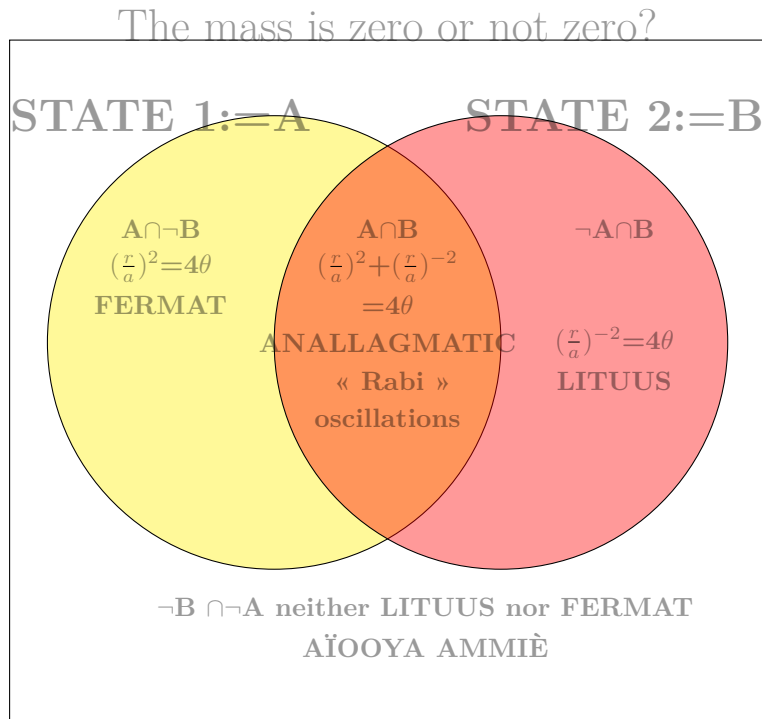
We denote  $\theta_{m^{twin}}$ , the internal spin of the mass (the negative mass  $M^{(-)}$  located in the twin universe which is equivalent to the mass  $m^{twin}$  of the twin universe here) which indicates the internal number  $\theta_{m^{twin}}^{int}$  of rotations of angle  $2\pi$  and  $\theta_{m^{twin}}$  the associated fixed non-zero angle equal to  $2k\pi$ . We can write  $m^{twin} = \theta_{m^{twin}}^{int} \frac{m^{twin}}{\theta_{m^{twin}}}$ , then  $\theta_{m^{twin}}^{int}$  is equal to  $0 + 2k\pi$  and 0 modulo  $[2k\pi]$  (where  $k$  is a great integer), so the mass  $m^{twin}$  is zero if  $\theta_{m^{twin}}^{int} = 0$ , then  $m^{twin} = 0 \cdot \frac{m^{twin}}{2k\pi}$  and not zero if  $\theta_{m^{twin}}^{int} = 2k\pi$ , then  $m^{twin} = 2k\pi \cdot \frac{m^{twin}}{2k\pi} \neq 0$ . Therefore the mass  $M^-$  is zero (STATE 1) and not zero (STATE 2) at the same time. In STATE 1 we have a Fermat spiral  $(\frac{r}{a})^2 = 4\theta$  and in STATE 2 we have a Lituus spiral  $(\frac{r}{a})^{-2} = 4\theta$ , by superimposing the two states simultaneously which gives in vector language  $\frac{1}{\sqrt{2}} \cdot (|\text{STATE 1}\rangle + |\text{STATE 2}\rangle) = \frac{1}{\sqrt{2}} \cdot (|M^- = 0\rangle + |M^- \neq 0\rangle) = \frac{1}{\sqrt{2}} \cdot (|m^{twin} = 0\rangle + |m^{twin} \neq 0\rangle)$ , which corresponds to summing the two left members in order to merge the two spirals:  $(\frac{r}{a})^2 + (\frac{r}{a})^{-2} = 4\theta$  which is equivalent to  $r^2 = a^2(2\theta \pm \sqrt{4\theta^2 - 1})$ , it is the anallagmatic spiral which represents the galaxy M83 (FIGURE 50D).

The mass is zero or not zero?



The mass is zero or not zero?





The tetravalent logic combined with the use of angular magnitudes makes it possible to deepen the real structure of the universe and to explain certain phenomena which disconcert the specialists and the forms of certain galaxies (in particular the barred spiral galaxies) as we have seen, the Ummites are therefore right.

The "neither LITUUS nor FERMAT" case may include irregular galaxies. Elliptical galaxies are the merger of two spiral galaxies, so they belong to set A or set B, or the intersection  $A \cap B$ .

An elliptical galaxy is a type of galaxy that groups together spheroidal concentrations of billions of stars that resemble large-scale globular clusters. They have a very small internal structure and the density of stars decreases slowly from the very bright center towards diffuse edges. They are classified in the Hubble sequence as type E and vary according to their shape from type E0 (circular), to type E7 (strongly elliptical).

Although there may be exceptions, their general characteristics are:

- the movement of stars is random unlike spiral galaxies where all the stars are in rotation;
- they contain a small proportion of matter and interstellar gas and therefore few new stars can form there;
- they are made up of old stars (stars of population II).

Edwin Hubble reported elliptical galaxies as "early" galaxies, because he thought they evolved into spiral galaxies (which he called "late"). Astronomers now think the opposite in this case (i.e. spiral galaxies can turn into elliptical galaxies), but Hubble's terms early and late are still used.

Once thought to be a simple type of galaxy, ellipticals are now known as complex objects. Part of this complexity is due to their amazing history: the ellipticals are believed to be the end product of the merger of two spiral galaxies.

Elliptical galaxies span a wide range of size and brightness, from elliptical giants, hundreds of thousands of light-years in size and nearly a billion times brighter than the Sun, to elliptical dwarfs, just a little brighter than an average globular cluster. They are divided into several morphological groups:

- CD galaxies: Huge, bright objects that can be almost 1 Megaparsec (3 million light-years) across. These titans are only found near the center of large, dense clusters of galaxies and are likely the result of multiple galaxies merging;
- normal elliptical galaxies: Condensed object with a relatively bright central surface. They include the giant ellipticals (gE), those of intermediate brightness (E) and the compact ellipticals;
- dwarf elliptical galaxies (dE): This group of galaxies is fundamentally different from normal ellipticals. Their diameter is on the order of 1 to 10 kiloparsecs, with a surface brightness that is much lower than normal ellipticals, giving them a much more diffuse appearance. They show the same characteristics of gradual decline in star density from a relatively dense center to a diffuse periphery;
- Dwarf spheroidal galaxies (dSph): Extremely low luminosity, low surface luminosity and observed only in the vicinity of the Milky Way, and possibly other very nearby groups of galaxies, such as the Leo group. Their absolute magnitude is only 8 to 15. The Dragon Dwarf spheroidal galaxy has an absolute magnitude of 8.6, making it fainter than the average globular cluster in the Milky Way;
- Blue compact dwarf galaxies (BCD): Small galaxies are rarely blue. They have photometric colors of  $B-V = 0.0$  to  $0.30$ , which is typical of relatively young stars of spectral type A. This suggests that BCDs are active star forming zones. These systems also contain abundant interstellar gas (unlike other elliptical galaxies).

An irregular galaxy is a galaxy which shows no regular or discernible structure<sup>1</sup> and which for this reason is classified separately in the Hubble classification of galaxies. Most irregular galaxies are dwarf galaxies (they contain 10 million to a billion stars). Their luminosity is not affected by their irregular shape because they are often rich in bright young stars, but their small size makes them difficult to detect, which is why we only detect those rather close to us. They often orbit around larger galaxies (spiral galaxies) which create compression waves (due to gravitation) which pass through the nebulae and trigger very rapid star formation there. They would have been very numerous in the past in the universe, but their number would have decreased following collisions (they would constitute 10% of the galaxies).

They therefore have no characteristic of spiral galaxies or elliptical galaxies. Irregular galaxies are generally quite rich in interstellar gas and dust (nebula) and in young stars (stars of population I). Some galaxies were classified as irregular galaxies, but have since been reclassified as "SBm" (some barred spiral galaxies). It is the type of magellanic galaxies, that is to say, which resemble the Magellanic Clouds.



The irregularity can result from several phenomena, among which:

- the merger of galaxies of similar sizes or the deformation under the effect of the gravitational influence of a more massive neighbor (case of the Magellanic Clouds).
- When a galaxy has too low a mass, the spiral unravels until it forms an irregular galaxy.
- Their formation may be due to a collision between two massive galaxies. The collision knocks stars out of the galaxy. In the end, what remains is the irregular galaxy and a long tail due to the collision.
- Strong internal activity (core).

The Hubble classification recognizes two types of irregular galaxies: Irr I and Irr II.

- The Irr I galaxies have some structures but not enough to classify them clearly among the other classes. They have an irregular appearance but the distribution of gases is regular inside. They are considered as spiral galaxies having failed to complete their formation (example: Large Magellanic Cloud). Some are classified Im, that is to say of Magellanic type. They have the beginning of an arm.
- The Irr II galaxies have no structure to classify them. Their irregularity occurs at all levels: visual and material distribution. These irregularities can come from a collision between galaxies or from a strong internal activity.
- AIOOYAA
  - verifiable existence, exists. "to exist": that which is dimensional with characteristics of time and space
- AĪOOYEEDOO
  - unreal, out of any verification framework, nothing
- AĪOOYA AMMIE:
  - does not exist dimensionally
  - unverifiable outside an individual or collective field of consciousness (examples: God, the soul, the collective soul)
  - what is dimensionless like intelligence or joy. (True out of WAAM)
- AIOOYAOU:
  - Potential or partially indeterminate phenomenological reality (example: Schrödinger's paradox which leads to the deduction of two superimposed contradictory potential states)
  - It is the 4th term of the tetravalent logic: it is not used by us in a current way, except by our specialists in theoretical cosmophysics. We sometimes use it in philosophical themes.
  - Letter NR 20: "If it is absolutely necessary to try to put a significance in terrestrial linguistics on this term, AĪOOYAOU would be the state of an indeterminate phenomenon"

whose emergence is perceptible or highly predictable but whose several updates are possible depending on of the various distortions inherent in the temporal flow which could modulate its concretion."

Principle of Non-Contradiction: In logic, the principle of non-contradiction is the law which prohibits affirming and denying the same term or the same proposition. We see that rejecting this principle allows us to say "IS and NOT IS" simultaneously.

Here are some excerpts to better understand the tetravalent logic used by the Ummites.

Letter D41-15

«There is great difficulty in translating the expressions of our cultural language, for its constellation of meanings is very different from the complexity of earthly equivalents. For example: we, we express by the phoneme AIOOYA your verb "EXIST, BE", but its real meaning for us has distinct nuances.

Thus we consider that the Cosmos, a virus or the helium gas AIOOYA O (exists)

On the other hand we express that: AIOOYA AMIEE (does not exist) the beauty, the soul or WOA. (S41-30)

How to understand this? It's simple, we apply the verb "to exist" to what is dimensional (with characteristics of time and space), and "not to exist" to what is dimensionless as intelligence or joy. To "NOTHING" we assign a verb that has no meaning for you; AIOYAYEDOO.

However, to avoid confusion, when we use, from now on, the expression "to exist", we will assign to it the meaning that you give to it, and we will do the same with other terms of ambiguous interpretation.»

Letter D59-2

«As you know, formal logic accepts the criterion that you call the "THIRD PARTY PRINCIPLE" according to which any proposition is necessarily TRUE or FALSE. In our WUUA WAAM this postulate must be rejected. We then have recourse to a type of multivalent logic that our specialists call UUWUUA IES (TETRAVALENT MATHEMATICAL LOGIC) according to which any proposition will adopt one of the four values:

AIOOYAA: TRUTH

AIOOYEEDOO : FALSE

AIOOYA AMMIE : can be translated as TRUE OUTSIDE THE WAAM

AIOOYAU : untranslatable in earthly language.

Nevertheless we still use the divine logic (we also use it in our daily life or in the study of macrophysical phenomena). We can offer you the concepts of WAAM. We will limit ourselves to define a system in which the infinitesimal calculus as well as the integral calculus, topology, tensor and vector calculus, graph theory and operational research, so familiar to earthlings, will be valid.»

Letter D68 «But where the barriers to the free flow of information are almost impassable and make it more difficult to understand our culture, it is in the field of LOGIC (we use two types of logic: a divalent one like the terrestrial one and another tetravalent one). (See our appendix n°3). This is serious because in the light of tetravalent logic, postulates validly acquired by the Philosophy of Law, acquire new dimensions, facets and even apparent contradictions which would appear paradoxical to you if you transposed their formulations in the philosophical context familiar to terrestrials.»

Letter D77

«We observe notable divergences between the bases of logic with which you are familiar and ours. We deny the earthly principle of the excluded third (exclusion of the middle term stated by Aristotle)

according to which propositions can only be TRUE or FALSE.

Such a determined dialectical line also requires that we deny the principle that you call CONTRADIC-

TION (for example in the field that we call BIEEWIGUU theory) (which can be translated as psychophysiology).

In all cases we respect what you call the principle of IDENTITY.

What we have just reported requires a clarification. In our normal "becoming", in our daily life, our dialectic can be confused with yours. If I say that YES, I woke up at 26 UIW, such a proposition is TRUE or I may have falsified reality, in which case another type of utterance distinct from TRUE or FALSE is not possible (and this HERE in my three-dimensional framework of my WAAM (Universe)).

For normal acts of everyday life, this artificial bipolar or bivalent principle, is valid or useful (you don't make relativistic corrections on the mass of a commodity moved from the merchant to the customer either).

But when we want to speculate about transcendent values or when we try to study concepts that you would call gnoseological, ontological, physical, biological, theological... this principle is totally rejected.

This is precisely the great obstacle to which we alluded in the previous paragraphs. How can we explain our metaphysical foundations to you if our respective "languages" are based on contradictory logical principles? The problem cannot be solved by a simple transcription of the meanings of phonemes, as you can imagine.

This is the reason why (apart from those inherent to the imperatives of censorship) we are obliged, in our reports, to use terra-centric comparisons, mutilated and narrow propositions which hinder all the informative richness of our dialectical expressions. Already the only use of the verb TO BE limits all our possibilities. All the ontology of the thinkers of the Earth is saturated with expressions like "TO BE", "I AM NOT", "I EXIST", without possibility of choice for other forms of distinct content.» Letter NR-20

«The interest in tetravalent logic is meritorious and it is indeed a path of research for which you can base yourselves on the theoretical developments made by your thinkers during the last decades. The enigma that our term AĬOOYAOU seems to constitute for you is caused by the indication given in our reports to your brothers that this term had no simple meaningful translation in your languages. It is important to understand that this term is not commonly used by us, except by our specialists in OOLGA WOU-OUA WAAM (theoretical cosmophysics), comparable to your terrestrial astrophysicists. We sometimes use it in philosophical themes concerning, for example, the finality of the OUAA (moral laws) in the process of conformation of our BOUAWA (soul) after the disappearance of our OEMII (body).

.../... Also AĬOOYAOU is a term we use to describe the potential state of existence of subatomic particles subject to quantum indeterminacy. Thus the state of existence AĬOOYAA is inapplicable to the electrons which evolve around the atomic nuclei and of which we only know how to perceive the remanent effects inside a predictable space-time envelope at the level of our measurement scales. We have also told you that the integration of your brother Sergio Vieira de Mello's soul into your collective psyche will have an influence on the behavior of a number of your brothers. This influence will have measurable psychosocial effects that will logically appear in the medium term. The barbaric act and the succession of inexcusable imprudences that led to this man's death could then be qualified as retropositive if these foreseeable psychosocial effects actually occur.

AĬOOYAOU can sometimes be projected into the classic AĬOOYAA / AĬOOYEEDOO (true /

false) axis if the actualization of the predicted phenomenon occurs or when the certainty that it will not occur is reached. If we must absolutely try to put a meaning in terrestrial linguistics on this term, AĪOOYAOU would be the state of an indeterminate phenomenon whose emergence is perceptible or strongly predictable but of which several actualizations are conceivable according to the different distortions inherent to the temporal flow that would modulate its concretion. I fear however that this abstruse definition will be a source of confusion for you.»

Tweet W1-74 of OAXIIBOO 6

Question: Are your 4 values of truths of your formal logic, disjointed or not?

Answer of OAXIIBOO 6: They are intricate, in the axis AĪOOYAA - AĪOOYAOU - AĪOOYEEDOO, and disjoint, in the axis AĪOOYAA - AĪOOYA AMMIÉ - AĪOOYEE-

DOO. The answer of OAXIIBOO 6 is consistent with the Venn diagram which represents the shape of galaxies, the irregular galaxies are in the set AĪOOYA AMMIÉ which has absolutely no relationship with spiral (or elliptical) galaxies: AĪOOYAA and the barred spiral galaxies: AĪOOYEEDOO, so their shape is foreign to the superposition of the two states AĪOOYAA - AĪOOYEEDOO called AĪOOYAU or AĪOOYAOU.

We give a simple example in the diagram below by considering the set of fundamental colors red, yellow and blue. Yellow represents then the state (A) AĪOOYAA (verifiable existence) and red the state (B) AĪOOYEEDOO (unreal; out of any verification frame). The color orange is a compound of red and yellow, the color blue is composed neither of yellow nor of red. In this logic the complementary of AĪOOYAA is not AĪOOYEEDOO. Thus the proposition for you contradictory "X EXISTS" and "X DOES NOT EXIST" is, according to the context:

- reduced to a formal impasse  $\emptyset$  : (A A) or (B B) ;

- reduced to a potential or partially indeterminate phenomenological reality (A B). This AĪOOYAOU state is well summarized in the paradox imagined by your thinker Schrödinger which leads to the deduction of two superimposed contradictory potential states due to the quantum nature of the phenomena implemented in the experiment;

- extended to an existence AĪOOYA AMMIÉ (B A), unverifiable outside an individual or collective field of consciousness. The intellectual processes associated with abstract concepts, or emotions of an empathetic or compassionate nature, which many of your thinkers associate with phenomena of purely biochemical origin and which we partially externalize to transcendent entities such as the individual soul (BOUAWA), the collective psyche (BOUAWEE BIAEII) and God (WOA), are located at this level.

Logic is only the science that tries to formalize a metalanguage that would be underneath well-made reasonings, that is to say reasonings that arrive at valid conclusions (valid for human intersubjectivity at a precise moment) from premises accepted as correct.

In order to talk about tetravalent logic, we must first take a look at language and more precisely at the objects that language handles. That's why, before logic, we have to take a look at ontology, without confusing ontology and logic.

ONTOLOGY ORMMA:

In the series of the letters D76 - D81 we have a notable outline of the "philosophy" U (if we can call it like that). In the letter D78 it is written:

Letter 78

We, OEMII, therefore see WAAM and its factors integrated into the S1; S2; .....; Sk opportunities. You, the men of the EARTH, accept for the moment only the possibilities S1 and S2.

For us the ontology is simple EXISTS / IS; DOES NOT EXIST / IS NOT, what the Ummans simplify in S1 and S2.

Of course this ontology so poor (S1 and S2), is translated immediately by a bivalent logic TRUE / FALSE.

The concept of "existing" comes from a long time in our languages, from a prehistoric past where probably the "existing" signaled only things "existing with dimensions" and our philosophers did not feel the need to make ontological distinctions to separate what exists in dimensions (a tree, the moon, the light...) from those other objects of the mental processes that are abstract or without dimensions (beauty, Peter Pan, the square root or God, the soul...)

Does God exist? The poverty of our languages prevents us from reasonably discussing this point, because there will be people who will say "Where is God? Show me!"

All this is fully known. We all know it very well.

Letter D105: First of all we distinguish between two classes of BEINGS existing in the WAAM (COSMOS) in opposition to two other great genera "NON-EXISTING ENTITIES". The latter are: AIOYAA AMMEIEE UAA [Such as: WOAA (The Generator!), BUAUAA (Human Spirit), BUAWEE BEIAEII (Collective Spirit) or BUAUAA BAAIOO (Spirit of the Living Being)] and AIOYAA AMEIEE QUEE (Such as: the content of a piece of information, the feeling of pleasure, or a folk tradition). "EXISTING" ENTITIES, whose essence is defined by the IBOZOO UU, such as a rock, a virus, a star, or the flow of time and which therefore allow an empirical path of analysis, then we define them as Existing. The distinction:

- AIOOYA => Existing with dimensions.
- AĪOOYEEDO => Does not exist.
- AIOOYAA AMĪÉE => Existing in an abstract way. Existing otherwise. Existing elsewhere the physical reality. is well known to us.

It should be added that the oummans make reside these last non dimensional entities (AIOOYAA AMIEE) in BB which is the universe of the forms. There, each humanity advances by depositing over time its cogitations and by consolidating these concepts (beauty, cruelty, justice, God, Red Riding Hood, ...) which are the object of a consensus, of an enlarged intersubjectivity. But this is not important for us to address the tetravalent logic.

We agree in any case that these first three ontological values are well known by us all.

#### THE TETRAVALENT LOGIC

For us, when we pass from the ontological level to the logical level, we use a different terminology: EXISTING is translated as TRUE and NOT EXISTING as FALSE. Our friends, however, use the same terminology, AIOOYA, AIOOYEEDO in both cases.

It would be easy for us to admit this extension of the ontology and to pass from binary logic to tri-logic, but our friends - always pose us difficulties and in addition to these three values (which we trace quite easily in an ontology of three values) - tell us.

Letter D59

As you know, formal logic accepts the criterion which you call "PRINCIPLE OF THE EXCLUDED THIRD" (according to which any proposition is necessarily TRUE or FALSE). In our WUUA WAAM this postulate must be rejected. We then have recourse to a type of multivalent logic which our specialists call UUUWUUA IES (TETRAVALENT MATHEMATICAL LOGIC) according to which any proposition will indiscriminately adopt four values:

- AIOOYAA : (TRUTH)
- AIOOYEEDOO : (FALSE)
- AIOOYA AMMIE : (can be translated : TRUTH OUT OF WAAM)
- AIOOYAU: (untranslatable in earth language).

We can see immediately, that apart from the first three terms of the tetra logic (which already makes agreement between us, apart from some nuances) it is AIOYAOU which causes us problems. But if we read the letters in depth we find :

Letter D77: We observe notable divergences between the bases of logic which are familiar to you and ours. We deny the earthly principle of the excluded third (exclusion of the middle term stated by Aristotle) according to which propositions can only be TRUE or FALSE.

Such a determined dialectical line also requires that we deny the principle that you call CONTRADIC-

TION (for example in the field that we call BIEEWIGUU theory) (which can be translated as psychophysiology).

In all cases we respect what you call the principle of IDENTITY. Let's look closely at these last paragraphs. What is the "principle of the excluded third"? What is the "principle of CONTRADICTION"?

If we go to Wikipedia we find : Principle of the excluded third: In formal logic, the principle of the excluded third (or "principle of the excluded middle" or "tertium non datur" or "principium medii exclusi", or simply the "excluded third") states that either a proposition is true, or its negation is true.

Principle of Non-Contradiction: In logic, the principle of non-contradiction forbids to affirm and deny the same term or the same proposition.

We know that logic has developed by formalizing the syntactic structures of the language to find these joints that have a logical meaning (not, and, or, implication...). After that we apply a formalism to develop valid deduction rules. I'm not going to go into these rules, from the first syllogisms to the last formalisms, but what I want to do is to show that we have to go down from the ontological plane to a more abstract plane where we use a more formalized metalanguage.

So if we formalize a bit what is deduced from the above letters, we could use a more concise abstract language to designate those terms valid in tetra logic:

AIOOYAA  $\Rightarrow$  A

AIOYEEDOO  $\Rightarrow$   $\neg$ A

AIOYAA AMMIEE  $\Rightarrow$   $\neg$  (A  $\vee$   $\neg$ A)

AIOOYAOU  $\Rightarrow$  A  $\wedge$   $\neg$ A

We can still overcome the formalism and write

AIOOYAA  $\Rightarrow$  1

AIOOYEEDOO  $\Rightarrow$  0

AIOOYAA AMMIEE  $\Rightarrow$   $\neg$ (1  $\vee$  0)

AIOOYAOU  $\Rightarrow$  1  $\wedge$  0

It's amazing how these valid terms of tetra logic, deduced squarely from the "ancient" letters approach what is written in NR20, but we still need to take a step forward.

For the terms 1, 0,  $\neg$ (1  $\vee$  0) we have no difficulty in pointing out its ontological correlates, but for the term AIOOYAOU, for the value "IS and IS NOT"? What does it mean if something IS and IS NOT at the same time?

Our friends are pragmatic. Even if for their deepest speculations they reach a degree of abstraction that surprises us, we quickly discover that below this level there is always something that can be subject to experimentation.

Where to place these things that ARE and ARE NOT simultaneously? It is easy to imagine (even more so if one has read NR20) that we are surrounded by phenomena that do not exist at the

present moment but such that their emergence at a given moment can be estimated mathematically by the appearance of certain precursory symptoms.

How to qualify ontologically these foreseeable events but which ARE NOT yet? These are events that ARE and ARE NOT.

It is not the rejection of the principle of the excluded third (which must be correlated to AIOOYAA AMMIEE) but the rejection of the principle of CONTRADICTION that puts us on the track of AIOOYAOU.

Letter D77: We observe notable divergences between the bases of logic that you are familiar with and ours. We deny the earthly principle of the excluded third (exclusion of the middle term stated by Aristotle) according to which propositions can only be TRUE or FALSE.

Such a determined dialectical line also requires that we deny the principle that you call CONTRADICTION (for example in the field that we call BIEEWIGUU theory) (which can be translated as psychophysiology).

In all cases we respect what you call the principle of IDENTITY. In logic, the principle of non-contradiction is the law that forbids to affirm and deny the same term or the same proposition. Rejecting this principle allows us to say "IS and NOT IS" simultaneously.

We see that the other three terms of their logic (AIOOYAA, AIOYEEDOO and AIOOYAA AMMIEE) are already identified (with AIOOYAA AMMIEE formalized as the rejection of the principle of the excluded third), but that we still have AIOOYAOU that we must necessarily correlate with the rejection of the principle of CONTRADICTION, because it is the only track left to identify this rejection pointed out in the letter D77.

With this we get that the formalization for AIOOYAOU is "IS and NOT IS" or with a more synthetic notation " $A \wedge \neg A$ ".

If we try to find "facts" in our reality that could answer this apparent nonsense of "IS and NOT IS", we would find for example Schrödinger's cat that is "dead and not dead".

But who had spotted before the arrival of this letter NR20 has this Principle of CONTRADICTION? It is not the logical formalization that is complicated, but the ontological counterpart.

+++ - As for the incorporation of the "excluded third", that is to say, denying that the choice A or Not A is obligatory (AIOYAA AMMIEE  $\Rightarrow \neg (A \vee \neg A)$ ), that is to say, the incorporation of a third value to the two values "IS" and "IS NOT", it is complicated at first, but we managed to accept it. For those who have deepened a little the Umma vision of things, we accept that there is a third option different from the two classic ones: "IS" and "IS NOT". We come to understand the Ummain concern with our term "EXISTS" and we accept the need to split it in two: "EXISTS WITH DIMENSIONS" and "EXISTS OTHERWISE THAN IN OUR PHYSICAL WAAM" (in the BB).

- But for what is to deny the Principle of Non Contradiction, that is to say to accept that an event can simultaneously "BE and NOT BE" (AIOOYAOU  $\Rightarrow A \wedge \neg A$ ), there it is more difficult.

It is understandable that the Ummans did not develop this concept before.

They tell us in Letter NR20; It is to be understood that this term is not used by us in a common way, except by our specialists in OOLGA WOU-OUA WAAM (theoretical cosmophysics), comparable to your terrestrial astrophysicists.

And in letter D77: Such a determined dialectic line also requires that one refuses the principle that you call CONTRADICTION (for example in the field that we call BIEEWIGUU theory) (which can be translated as psychophysiology).

We can see that the state of being "AIOOYAOU" (and its logical correlate AIOOYAOU), is only

rarely used, and we understand that the Ummans have left this concept without explanation for years, because even if AĪOOYAOU can be written in a line "AĪOOYAOU => A  $\wedge$   $\neg$ A", to develop its ontological meaning (in which forms this kind of phenomenon EXISTS and DOES NOT EXIST) is not trivial and required a long and dense letter (the NR20).

Tweet O6-74

Q: Are your 4 values of truths of your formal logic, disjointed as Norman believes, or not, as I believe?

A: They are intertwined, in the axis AĪOOYAA - AĪOOYAOU - AĪOOYEEDOO, and disjointed, in the axis AĪOOYAA - AĪOOYAOU - AĪOOYEEDOO. The first question that Alban asked, is of course the question that troubled him the most after receiving the NR20. He and Norman had tried to formalize the tetravalent logic following the receipt of NR20, and while Alban had tried a literal approach to the contents of the letter, Norman had tried a more pragmatic approach with distinct values. Nevertheless, Alban's approach led him into some difficulties that Norman did not have because of his distinct values, which made Alban doubt his approach.

The answer here is more accurate than Alban expected. Indeed, both Norman and Alban thought that the value AĪOOYA AMMIÉ was disjoint, the uncertainty was only in the axis AĪOOYAA - AĪOOYAOU - AĪOOYEEDOO. If the answer had been right "they are intricate", Alban would have understood it as only in this axis. The answer here leaves no room for ambiguity.

AĪOOYAOU would be the state of an indeterminate phenomenon whose emergence is perceptible or strongly predictable but of which several actualizations are conceivable according to the various distortions inherent in the temporal flow which would know how to modulate its concretion.

An example seems to illustrate this idea: Let us admit that we have a "continuous" curve  $y = f(x)$  for  $x \in [0, 1]$  and such that there exists  $(x_1, x_2) \in [0, 1]^2$ ,  $f(x_1)=0$  and  $f(x_2)=10$ . It is possible to "prove" that there exists  $\alpha \in [0, 1]$  such that  $f(\alpha)=1$  (intermediate value theorem)  $\alpha$  is AĪOOYAOU: depending on the algorithm chosen, we may end up finding one or more acceptable values for  $\alpha$  after waiting for the algorithm to give (or not) an acceptable answer.

Let's try to illustrate.

Let us suppose a phenomenon P detectable by a set of conditions c1, c2 and c3. We have P if and only if c1, c2 and c3 are satisfied.

Suppose that our measurements satisfy c1, c2 and c3, then we "have" P.

Suppose that our measures do not satisfy c1, c2 and c3, then we "do not have" P.

Suppose that :

- \* our measurements satisfy c1,
- \* we are almost certain that c2 and c3 are satisfied,
- \* but our measurements can neither satisfy nor unsatisfy c2 and c3.
- \* Then P is AĪOOYAOU.

Example:

Let us call "X" the phenomenon such that the measurements m1, m2 and m3 give results r1, r2 and r3 included in the intervals:  $c1 = [0,1]$ ,  $c2 = [3,4]$ ,  $c3 = [10,123]$ .

If our measurements give:  $(r1,r2,r3) = (0,3,10)$  then we have detected "X":  $0 \in c1$ ,  $3 \in c2$ ,  $10 \in c3$ .

If our measurements give:  $(r1,r2,r3) = (234,-657,0)$  then we have detected something that is not "X".

If our measurements yield:  $(r1,r2,r3) = (0,\square,\square)$  where " $\square$ " means "no result", in other words "nothing", then c2 and c3 are neither validated nor invalidated: " $\square \in c2$ " is meaningless.

If, moreover, we are almost certain that c2 and c3 are indeed validated but we are unable to give the values of measures r2 and r3 then we cannot say that we "have X" nor that we "do not have X":



"X" is AĪOOYAOU.

The ummit word AĪOOYAOU (esp. AĪOOYAU) names one of the 4 states of the tetravalent logic: potential or partially indeterminate phenomenological reality (example: Schrödinger's paradox which leads to the deduction of two superimposed contradictory potential states).

AĪOOYAA (TRUTH; reality; exists; dimensional)

AĪOOYA AMMIÈ (TRUTH OUTSIDE THE WAAM; does not exist; adimensional)

AĪOOYAOU (phenomenon only observable by its consequences)

AĪOOYEEDOO (FALSE).

The ummite term AĪOOYAU (AĪOOYAOU) is untranslatable (D59-2). This term takes the reasoning out of the classical axis "true / false" (AĪOOYAA / AĪOOYEEDOO), because it is the fourth value of their tetravalent logic; this term refers to a phenomenon only observable by its consequences. It is also a term "to describe the potential state of existence of subatomic particles subject to quantum indeterminacy". (NR-20)

For the Oummites AĪOOYAOU is "the state of an indeterminate phenomenon whose emergence is perceptible or strongly predictable but of which several actualizations are conceivable according to the various distortions inherent in the temporal flow which would know how to modulate its concretion" (NR-20).

AĪOOYAOU (the potential state of existence of subatomic particles subject to quantum indeterminacy. ... inapplicable to electrons evolving around atomic nuclei...) in the NR-20 letter.

Term of the theoretical Cosmophysics Letter NR-20 [...] our term AĪOOYAOU [...] is not used by us in a current way, except by our specialists in OOLGA WOU-OUA WAAM (theoretical cosmophysics), comparable to your terrestrial astrophysicists. We sometimes use it in philosophical themes concerning, for example, the finality of the OUAA (moral laws) in the process of conformation of our BOUAWA (soul) after the disappearance of our OEMII (body).

To approach the meaning of this term, you must return to the astonishing phenomenon concerning the toric nebulae IAGGIAAYAOO [...]. A sudden drop in the temperature of the gas in these nebulae allows us to predict future deformations or folds in the local tetradimensional structure of our WAAM (universe) due to the interaction with our anti-universe OUWAAM. This phenomenon occurs before the apparent cause of it has actually occurred. It is important to understand here that the measurable consequence of the distortion - the sudden drop in gas temperature - apparently precedes the distortion itself and does not in any way modulate its occurrence.

You would know how to interpret this phenomenon, in an imaginary way, as a shadow that would be projected by the wave caused in our WAAM by the clouds of imaginary matter present in OUWAAM. This shadow would thus be the reflection of an AĪOOYAOU phenomenon whose amplitude and spatio-temporal distance are uncertain, just as it would be uncertain to retranscribe the three-dimensional shape and the distance of an object - inaccessible to the senses and to the measuring instruments - from the shadow that it would project on the ground.

The analysis of the data at the time of the occurrence of this phenomenon allows us to refine the parameters of the mathematical model that we will inject into the SANMOO (computer) of each OAWOOLEA OUEWA OEM (spacecraft) destined to travel through the isodynamic conditions relative to the next folding. However, the model is imprecise because, if we know how to deduce with a correct approximation the amplitude of the fold, we do not know how to predict with accuracy the moment when it will start. We must sometimes wait several months before an expedition, prepared in a few days, initiates its journey.

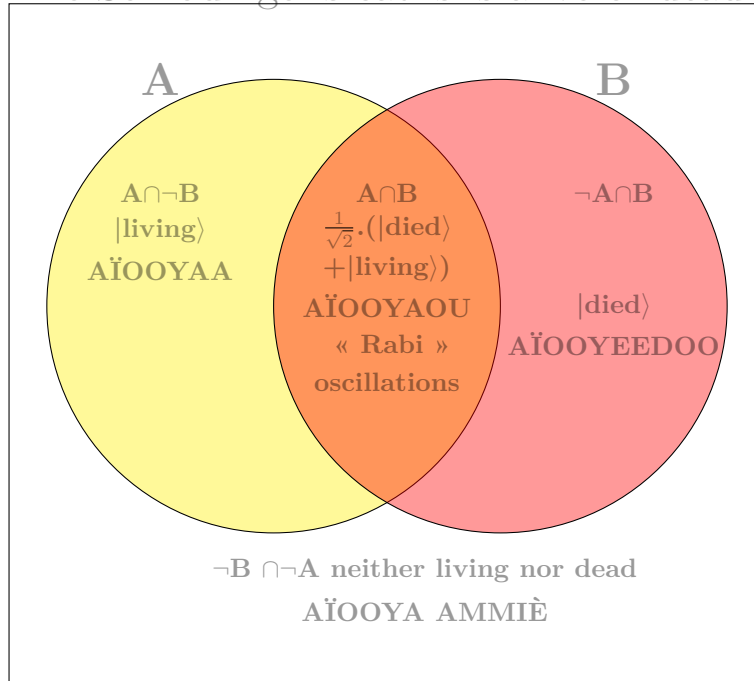
Please excuse me for this digression but it seems necessary to me to introduce this term which refers to a phenomenon only observable by its consequences but which remains itself partially

undetermined because it is outside our inevitably limited field of perception and subordinated to the stochastic perturbations of the WAAM which necessarily modulate the information conveyed by the temporal flow.

Also AĪOOYAOU is a term that we use to describe the potential state of existence of subatomic particles subjected to quantum indeterminacy. Thus the state of existence AĪOOYAA is inapplicable to the electrons which evolve around the atomic nuclei and of which we only know how to perceive the remanent effects inside a predictable space-time envelope at the level of our measurement scales. We have also told you that the integration of the soul of your brother Sergio Vieira de Mello [2003] into your collective psyche will have an influence on the behavior of a number of your brothers. This influence will have measurable psychosocial effects that will logically appear in the medium term. The barbaric act and the succession of inexcusable imprudences that led to this man's death could then be qualified as retropositive if these foreseeable psychosocial effects actually occur. AĪOOYAOU can sometimes be projected into the classic AĪOOYAA / AĪOOYEEDOO (true / false) axis if the actualization of the predicted phenomenon occurs or when the certainty that it will not occur is reached.

If we must absolutely try to put a meaning in terrestrial linguistics on this term, AĪOOYAOU would be the state of an indeterminate phenomenon whose emergence is perceptible or strongly predictable but of which several actualizations are conceivable according to the different distortions inherent to the temporal flow that would modulate its concretion.

The Schrödinger's cat is is alive or dead?



For those who are specialists in the UMMO dossier, the letter from Riyadh that we discussed earlier, addressed to Jean-Pierre Petit, has no connection with the tetravalent logic. The signature of this



letter in the first version circulated by J-P Petit was as follows. Dictated by OAXIIBOO 6 daughter of IRAA 3. But this signature has been analyzed as false in the "signature studies" analysis. Moreover, the members of the GR1 microgroup who, at the time of its reception, had access to the undisclosed and deleted part of the GR1-10 letter, declare:

- That we had pledged, prior to reading it, not to reveal its contents.
- That after the new indications given by our communicators in OAY-92, we feel partially released from such a commitment.

By virtue of this new situation, we announce that, in this undisclosed part of GR1-10, the falsity of all the letters received by JP Petit has been confirmed, except for the resolution of Fermat's theorem, with the absurdities  $0=1, 0 \neq 0, 1 \neq 1$ , etc., that have nothing to do with a tetravalent logic.

AIOOYAA  $\Rightarrow 1 \Leftrightarrow 1=1$

AIOOYEEDOO  $\Rightarrow 0 \Leftrightarrow 0=0$

AIOOYAA AMMIEE  $\Rightarrow \neg(1 \vee 0) \Leftrightarrow 1 \neq 1$  and  $0 \neq 0$

AIOOYAOU  $\Rightarrow 1 \wedge 0 \Leftrightarrow 1 \neq 0$  or  $0 \neq 1$ .

They are intertwined, in the axis AĪOOYAA - AĪOOYAOU - AĪOOYEEDOO.

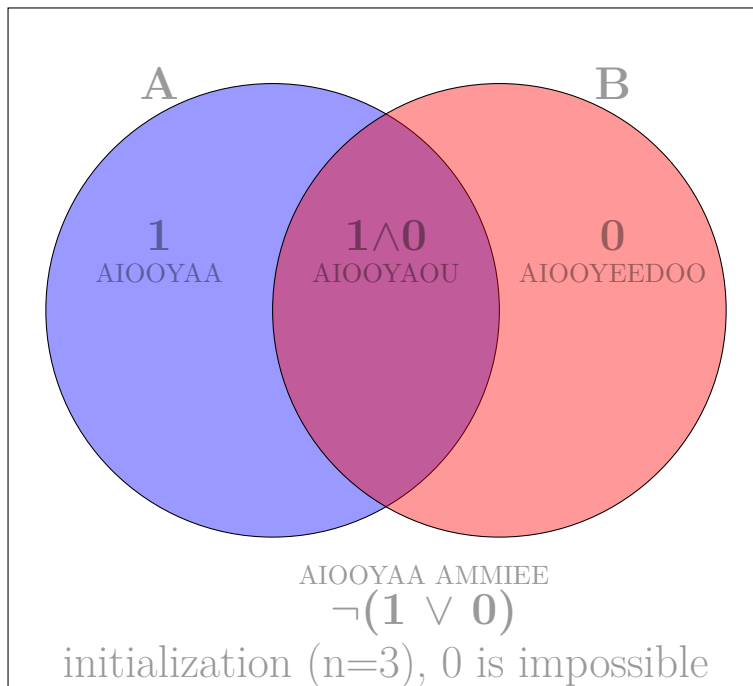
The 4 values of truths are intricate, in the axis AĪOOYAA - AĪOOYAOU - AĪOOYEEDOO, so that gives the intricate inequalities  $1 \neq 0$  and  $0 \neq 1$  corresponding to AĪOOYAOU (TRUE and FALSE at the same time).

In other words, an assertion which is FALSE and TRUE at the same time, is translated by these two binary inequalities, to mean that  $0=FALSE$  and  $1=TRUE$  coexist while being antinomic to each other, i.e.  $TRUE \neq FALSE$  together with  $FALSE \neq TRUE$ : AIOOYAOU  $\Rightarrow 1 \wedge 0 \Leftrightarrow 1 \neq 0$  or  $0 \neq 1$ .

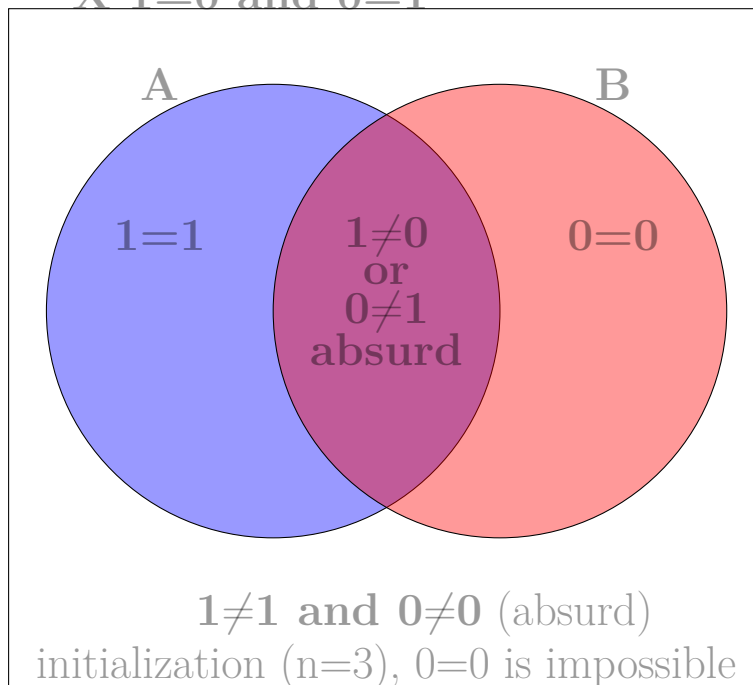
On the other hand they are disjoint, in the axis AĪOOYAA - AĪOOYA AMMIÉ - AĪOOYEEDOO so that gives the disjoint inequalities  $1 \neq 1$  with only 1 in the same inequality and only 0 in the other inequality  $0 \neq 0$  corresponding to AĪOOYA AMMIÉ (neither TRUE nor FALSE).

TRUE is different from TRUE, FALSE is different from FALSE, logical assertions don't make sense anymore, it's TRUE outside the WAAM: AIOOYAA AMMIEE  $\Rightarrow \neg(1 \vee 0) \Leftrightarrow 1 \neq 1$  and  $0 \neq 0$ .

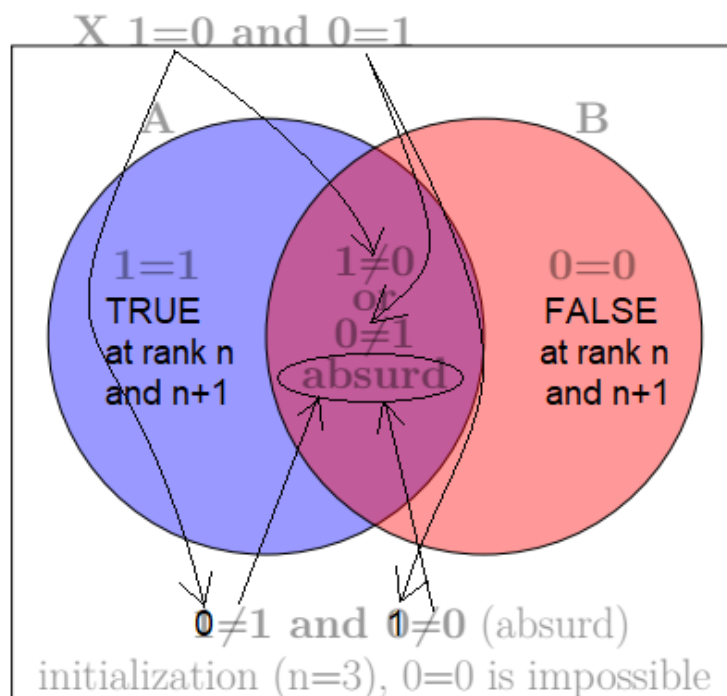
Finally the two values of the divalent logic used in every day life: AIOOYAA (TRUE=1) and AIOOYEEDOO (FALSE=0) can result in binary equalities, because 1 in binary logic means  $1=1$  and 0 means  $0=0$ , so we have two binary equalities.



**X**  $1=0$  and  $0=1$



In the Fermat's equation, we also have another equality  $1=0$ , (TRUE=FALSE) obtained by



replacing all the binary variables by TRUE ( $1+1=1 \Leftrightarrow 1=0$  and  $0=1$ ), which makes it possible to cross the binary equalities with the inequalities binary, that is to say that  $0=0$  becomes  $1=1$ , and vice-versa, and the entangled binary inequalities become the disjoint binary inequalities and vice-versa, and thus we see appearing contradictions for these two types of inequalities, and so there remains  $1=1$  or  $0=0$ , which are then equivalent with  $1=0$ , but since the proposition is true for  $n=3$ , i.e. there is no strictly positive integers solutions to the Fermat's equation for  $n=3$ , then, we necessarily have  $1=1$  in initialization of the recurrence and therefore as we have  $1=1$  on any two consecutive rows ( $n$  and  $n+1$ ), we have  $1=1$  for all  $n \geq 3$ . The rambling logic is the use of duality  $0=\text{FALSE}/1=\text{TRUE}$  but it is not enough to explain some phenomena of the universe, where contradictory states can be coinciding at the same time, this is obviously the case in quantum mechanics with the oscillations of Rabi, but also for the shape of certain galaxies, such as the analgamatic spirals where the two states "mass of the twin universe zero" and "mass of the twin universe not zero", where the forms "Fermat spiral" and "Lituus spiral" coexist at the same time, or with the couple of field equations (couple of equations (34) and (34A)). In the demonstration of the Fermat's last theorem, tetravalent logic makes it possible to eliminate the case where the proposition is TRUE at rank  $n$  and FALSE at  $n+1$  and to eliminate the symmetric case where the proposition is FALSE at rank  $n$  and TRUE at rank  $n+1$  ( $1 \neq 0$  and  $0 \neq 1$ ), by extension of the case neither TRUE nor FALSE ( $1 \neq 1$  and  $0 \neq 0$ ). Thus it remains only to decide between the two cases: proposal is TRUE at rank  $n$  and TRUE at rank  $n+1$  ( $1=1$ ) and proposal is FALSE at rank  $n$  and FALSE at rank  $n+1$  ( $0=0$ ). It is a generalization of the oscillations of Rabi to mathematical objects, that is to say an superposition of two states for the same couple of equations (rank  $n$ , rank  $n+1$ ) which are both one and a single equation  $1+1=1 \Leftrightarrow 1=0$  and  $0=1$  (by filling in all binary variables

by 1 in the Fermat's equation). By combining TRUE/FALSE with rank  $n$  and rank  $n+1$ , we have the 4 possibilities (AIOOYAA, AIOOYEEDOO, AIOOYAA AMMIEE and AIOOYAOU), hence the term tetravalent (the tetra prefix which means 4). For example Tetrapods (Tetrapoda) are a superclass of gnathostome vertebrate animals whose skeleton usually has two pairs of members (the TETRA prefix means 4 members to move) and whose breathing is normally pulmonary. The first tetrapods were exclusively aquatic animals.

Current tetrapods are amphibians, reptiles, birds and mammals. Some species have lost some of the characteristics of the group. Thus the legs have disappeared (internal remains can remain) independently in serpentiform animals, including aistopods (extinct), gymnophiones, orvets, snakes. The front legs have transformed into wings in birds, pterosaurs or bats. The lungs gradually disappeared in salamanders of the Plethodontidae family.

The appearance of aquatic tetrapods dates from "the end of the Middle Devonian, in a narrow range between 375 and 380 Millions of years." The first known outflows date from -365 Millions of years, with Ichthyostega, «the oldest known vertebrate with adaptations for a locomotion other than swimming».

The tetrapods are a clade within the sarcopterygians, which today includes two taxa: amphibians and amniotes (reptiles, birds, mammals). They are characterized by the presence of two pairs of chiridian limbs (two anterior or scapular limbs and two posterior or pelvic limbs) which are homologous to the paired fins of fish.

The chiridian limbs are divided into three parts:

- stylopod: humerus on the forelimb, femur on the hindlimb;
- zeugopod: radius/cubitus on the forelimb, tibia/fibula on the hind limb;
- autopod: carpus-metacarpus-phalanges (forelimb), tarsus-metatarsus-phalanges (hind limb). This basic pattern has undergone many variations in relation to the adaptation to various modes of locomotion of tetrapods (flying, swimming, jumping, running, foraging ...).

Other derived characters:

- lacrimal duct between eye and nasal sac ;
- head separated from the rest of the body by a neck ;
- hyomandibular bone of the jaw passing in the bones of the hearing;
- first cervical vertebra becoming the atlas.

The definition of tetrapods is not easy. Between the first sarcopterygians, fish with fleshy fins on the one hand, and the tetrapods that conquered terrestrial autonomy (amniotes) on the other, there are many intermediate types, called amphibians. Within vertebrates, tetrapods are characterized by their evolutionary history: that of the conquest of the terrestrial environment.

In nature today, tetrapods are represented by more than 33,000 species including "modern" amphibians, or lissamphibians (apodians, salamanders, newts, frogs, toads), and amniotes (birds, mammals as well as chelonians, squamates and crocodylians, these last three groups representing what was formerly called reptiles). During their long history of nearly 400 million years, some tetrapods, such as snakes, have lost their locomotor limbs and have compensated by adapting to

crawl. Others, such as cetaceans, lost their hind limbs to better move through the water. Tetrapods also include a large number of extinct groups, mostly of Paleozoic age (540-250 million years), which were basal tetrapods or primitive forms related either to lissamphibians (this is the case, probably, of temnospondyls and certainly of lepospondyls), or to amniotes (anthracosaurs, seymouriamorphs). "The fossil record, as well as the study of present-day vertebrates, suggests that the tetrapod trunk split early on into two main branches - the amphibians and the amniotes (reptiles, birds and mammals).

The appearance of the amniotic egg will allow a large evolutionary radiation of the tetrapods, without making the non-amniotic tetrapods (Lissamphibia) disappear. All present-day terrestrial vertebrates are therefore a monophyletic group descended from the first tetrapods of the Terminal Devonian, and are therefore considered as a clade in cladistics. The phylogeny below represents one of three competing hypotheses, according to which lissamphibians are derived from temnospondyls. According to the other two hypotheses, present-day amphibians are either derived from lepospondyls or from both temnospondyls and lepospondyls (they are then polyphyletic).

"Pulmonary respiration, that is, the ability to breathe oxygen directly from the air through a lung (originally a pulmonary sac), is an important characteristic of tetrapods, one of those that allowed them to colonize terrestrial environments.

This adaptation is however older than the tetrapods, since it goes back beyond 400 Millions of years, even if these are today almost the only vertebrates to still have one or more lungs.

Pulmonary respiration is initially not an adaptation to life out of water, but to life in oxygen-poor aquatic environments. "Why [...] did some fish evolve to breathe in the open air? [...] The shape of their skulls gives us a first clue: the skull is flattened, which suggests that they lived in shallow waters<sup>1</sup>".

"In the Devonian, some plants diversified and multiplied, and many of them acquired deciduous foliage [which falls off seasonally] at this time. The wood and other dead leaves produced by these plants then cluttered, even saturated, the shallow aquatic environments. [...] In addition, warm waters are less oxygenated than cold waters. 1 Warm waters have a lower capacity to dissolve oxygen from the air, and rotting vegetation consumes (by oxidation) the remaining oxygen, a phenomenon called eutrophication.

The waters of warm marshes, overgrown with rotting vegetation, are therefore low in oxygen. Many fish lines living in these environments have therefore developed specific adaptations to directly capture oxygen from the air. This is the case of the anabantidae, which have developed an organ called labyrinth. Other fishes "piped" the air at the surface and stored it in their intestines, from where the oxygen passes into the bloodstream. Some Sarcopterygians have thus developed a specific organ, the lung. This one is an exaptation derived from the swim bladder.

The primitive lungs of sarcopterygians, as they still exist in lungfish or modern lissamphibians (amphibians), differ little from those of reptiles or mammals. The ribs do not move, and play no role during inspiration and expiration. It is the movement of the mouth, specifically the movements of the floor of the mouth, that sends air into the lungs, a function called the "mouth pump".

Sarcopterygians appeared towards the end of the Silurian (444 to 416 Millions of years). Although they probably appeared in a marine environment, some lineages quickly specialized in fresh water. The two main lineages, the actinistians (whose descendants are the coelacanth) and the rhipidistians (whose descendants are the tetrapods and dipnoi), diverged at the beginning of the Devonian (-416 to -359 Millions of years).

Today, lungfish are fishes, cousins of tetrapods, which have fully functional (non-alveolated) lungs alongside gills. The date of divergence from the lineage that leads to tetrapods being greater than

400 Millions of years, the appearance of lungs therefore dates back to at least this date.

Moreover, coelacanth, which have become purely marine, have a vestigial organ that is often considered to be the remains of an ancient, now non-functional lung. If this interpretation is correct, the appearance of lungs, or at least of primitive pulmonary sacs, goes back a few million years earlier, before the separation between the actinistians and the rhipidistians, i.e. at the very beginning of the Devonian.

After their appearance at the end of the Silurian, sarcopterygians experienced a major adaptive success in the Devonian (-416 to -359 Millions of years). "During this geological age [...], sarcopterygian fishes dominated all the seas, leaving only a small portion to placoderms (fishes covered with bony plates), acanthodians (fishes with spines) and chondrichthyans (primitive sharks) [...] [the] actinopterygians, the fishes as we know them, were then very little represented".

Also very present in fresh water (from which the marine sarcopterygians were at least partially originating), the group underwent various evolutionary radiations. One of the most important, the rhipidistians, saw the appearance, after 400 Millions of years, of a group of fishes called "tetrapodomorphs" which already announced the tetrapods by some of their bony evolutions, in particular at the level of the fins, of which certain characteristics began to announce the legs of the first tetrapods.

In fishes, the paired limbs, i.e. the pectoral and abdominal fins, consist of flattened and enlarged blades, supported by a multi-segmented but non-articulated skeletal stem, bearing laterally a series of rays. These limbs that biologists call pterygium have various structures that give the name to the main groups of fish (-pterygians). The chiropterian limbs (paired and articulated locomotor appendages, polydactyl and then pentadactyl, a plesiomorphic ancestral character derived from the chiropterian limb) of the tetrapod vertebrates is homologous to the pterygium of the fishes, the main difference being that its segments are united by numerous mobile joints. The transformation of the fins of the aquatic ancestors of the osteolepiforms of the Tetrapods into chiropterian limbs allows the establishment of quadrupedalism, the initial mode of terrestrial locomotion widely favored.

Fleshy lobed fins, supported on bones rather than the reinforced fins of rays, seem to have been an original feature of bony fishes (Osteichthyes), the group within which the sarcopterygians were individualized. The most primitive group with ray fins, the bichirs, still has fleshy frontal fins.

The primitive tetrapods and their chiropterian limb developed from a tetrapodomorph, with a two-lobed brain in a flattened skull, a wide mouth and a short snout, and whose upward-facing eyes indicate that it lived on the bottom. Its monobasal pectoral and pelvic fins (a single bone articulates with the girdle) already showed signs of adaptation with fleshy bases and bones.

A tetrapodomorph even closer to the first tetrapods was Panderichthys (-385 Millions of years), which even had choanae. This fish used its fins as paddles, as it lived in shallow waters overgrown with plants and detritus. It is possible that it used its fins to cling to plants or something else while it lay in ambush waiting for its prey. Panderichthys is an Elpistostegalia, like the tetrapods, but it is more a cousin than a direct ancestor.

Tetrapodomorphs lived in all environments: fresh water, brackish water (estuaries) and salt water, and as well in the large southern continent at the time, Gondwana, as in the small northern continent, Euramerica.

In the Upper Devonian (383 to 359 Millions of years), tetrapods that were still aquatic seem to have lived mainly in brackish water (estuaries, coastal marshes). Isotopic analysis of "fossils of early tetrapods and their associated fauna from Greenland and China [...]" has demonstrated that these tetrapods lived in brackish waters. [...] The first tetrapods were therefore able to tolerate a wide range of salinities, like many present-day fish living in these environments, such as eels or salmon.



This ability to occupy very diverse environments would have facilitated their rapid dispersal to all continents, a prelude to the terrestrialization of certain lineages.

Eusthenopteron foordi, another tetrapodomorph fish with a lung.

Still around 385 Ma, the genus Eusthenopteron is also known, which shows tooth and skull bone shapes typical of posterior tetrapods, as well as choanae.

The appearance of proto-paws is the main sign of the transition from tetrapodomorphs such as Panderichthys (-385 Millions of years) to the first true tetrapods, which were still completely aquatic.

Contrary to a common belief, chirodian limbs first appeared in entirely aquatic organisms. The first fossil legs thus appear as a kind of paddle, well adapted to moving around (spreading, grabbing) in the vegetal clutter of submerged banks and swamps.

Secondly, these aquatic "legs" were reused to allow movement out of the water, as shown by the study of two species of fossil tetrapods, Acanthostega and Ichthyostega.

The universal characteristics of tetrapods: forelimbs turned backward toward the elbow and hindlimbs turned forward toward the knee, can already be spotted in the first tetrapods that lived in shallow water.

Nine genera of Devonian tetrapods have been described, several of which are known, in whole or in part, only by what remains of the lower jaw. All lived in the North American-European supercontinent, which included Europe, North America and Greenland. The only exception is a unique genus from Gondwana, Metaxygnathus, which was found in Australia.

The first identified Asian Devonian tetrapod was recognized from a fossil jaw described in 2002. The Chinese tetrapod Sinostega pani was discovered among fossilized tropical plants and sarcopterygians in red sandstone sediments of Ningxia Hui, an autonomous region of northwest China. This discovery has greatly expanded the geographic distribution of these animals and raised new questions about their global distribution and the great taxonomic diversity they achieved in a relatively short time. By the time of the Late Devonian, terrestrial plants had stabilized freshwater habitats, allowing early wetland ecosystems to develop, with increasingly complex food webs that provided new opportunities. Freshwater habitats were not the only places where water filled with organic matter could be found in conjunction with dense vegetation near the water's edge. Marshy habitats such as shallow wetlands, coastal lagoons, and large saltwater river deltas also existed at this time, and many experts suggest that it was in such an environment that tetrapods evolved. Fossils of the earliest tetrapods have been found in marine sediments, and since they have been found all over the world, they must have expanded along coastal lines - so they could not have lived only in fresh water.

To settle the debate on whether the first aquatic tetrapods lived in freshwater, saltwater or brackish water, Jean Goedert and Christophe Lécuyer's team published an article in the journal Nature on May 30, 2018, in which they analyzed the ratios of oxygen, sulfur and carbon isotopes in fossils, knowing that these ratios vary depending on the salinity of the environment. Their conclusion is that "Devonian tetrapods were animals adapted to environments of variable salinity where marine prey is found, in other words to estuaries, lagoons and other salt marshes found on coasts all over the planet." The "oxygen isotope ratio [...] is found to be much lower than that of highly oxygenated seawater, suggesting an oxygen-poor environment". While the sea was not the dominant environment for aquatic tetrapods, their tolerance of salty environments allowed them to expand rapidly across the planet.

The appearance of aquatic tetrapods dates from "the end of the Middle Devonian, in a narrow range between 375 and 380 Millions of years". Not all scientists agree with this age, not because of

dating uncertainties, but rather for reasons of definition of what makes the difference between a tetrapodomorph and a tetrapod. Some see the appearance of tetrapods around -370 Millions of year, with the appearance of the first humeri.

It is traditionally assumed that the first tetrapods evolved in freshwater, shallow, swampy habitats. One of the earliest known tetrapod-like fossils is that of Tiktaalik roseae, dated to 380-375 Millions of year.

Along with attributes characteristic of bony fish (scales, pectoral and pelvic fins with rays), Tiktaalik's robust pectoral fins were stiffened by a jointed bony skeleton. "Its morphology is similar to that of fish, but the articulation of its pectoral fins suggests that Tiktaalik could support its body weight. The shoulder and elbow are flexible, unlike fish," the researchers explain in the journal *Nature*. These anatomical characteristics, which should allow it to emerge punctually from the water, make it a possible evolutionary link between fish (like Panderichthys) and the more assertive tetrapods (like Acanthostega).

Some scientists consider it as a very primitive tetrapod, while others still see it as a tetrapodomorph, simply more advanced than Panderichthys (-385 Millions of years) on the way to the appearance of legs. One of its discoverers, Neil Shubin, even qualified it as a fishapod, contraction of fish and tetrapod.

Dating from a few million years after Tiktaalik, "the oldest fossil humerus in the world would have been discovered by researchers [...]. Old of more than 370 Millions of years, this last one would offer the proof to the scientists that the members first evolved in the water [...]. After analyzing this fossil, Neil Shubin and his colleagues at the University of Chicago (USA) found that the characteristics that paleontologists usually attribute to life in the terrestrial world are more likely to be from an aquatic environment. This humerus belonging to a fin would have allowed, according to them, the animal to support the body and, on the other hand, would have helped it to raise the head", perhaps to take it out of the water to breathe air. Around -363 Millions of years, Acanthostega is a purely aquatic tetrapod, whose limbs have eight fingers, but already quite evolved, with its four swimming legs, which must have allowed it to move by grabbing the dense aquatic vegetation of the banks. Acanthostega is rather late, since it dates from shortly before the great extinction of the tetrapods of the Terminal Devonian. But it is a good model of aquatic tetrapods. It is possible that it used its front legs to rest on a support (submerged branches, shallow bottoms), in order to lift its heavy head out of the water to breathe better, but the design of its ribs and legs excludes an exit from the water. Indeed, "Acanthostega's limbs were too weak and poorly oriented to allow it to walk on land."

The (partially hypothetical) reconstruction of an aquatic tetrapod perhaps sometimes emerging from the water, Tulerpeton. Around the same time as Acanthostega, Tulerpeton (-363 Millions of years) is another aquatic tetrapod reconstructed by a fragmentary skeleton found in Tula, Russia. Only the legs, anterior shoulders and part of the snout were found. The animal had 6 digits, and its limbs resemble aquatic paddles more than walking legs. Nevertheless, the digits are relatively long and slender, suggesting a more terrestrial habitat than Acanthostega. The shoulder bones are also more robust, which could have also facilitated exits from the water. Finally, if it is risky to define precisely the way of life of Tulerpeton, the bones found seem to be those of an animal with aquatic dominance, although being able to get out of water better than Acanthostega.

When did the first tetrapods leave the water?

Ichthyostega, "the oldest known vertebrate with adaptations for locomotion other than swimming". The first known exits from the water date from the Upper Devonian, around -365 Millions of years, with Ichthyostega, "the oldest known vertebrate with adaptations for locomotion other than

swimming".

Ichthyostega is not a fully terrestrial tetrapod, but it shows new adaptations to life out of water. Indeed, after the appearance of lungs in some Sarcopterygians, choanae in tetrapodomorphs and legs/fin in the first aquatic tetrapods, Ichthyostega has three major adaptations: front legs capable of supporting its weight out of the water, elongated ribs that prevent the lungs from being crushed by the weight of the body out of the water, and "a chain of bones running down the middle of the chest. Jennifer Clark, one of the authors of the study, states in the journal *Nature* "that these bones in the chest are the first appearance in evolution of a body sternum. Such a structure was to strengthen the rib cage of Ichthyostega, allowing it to support part of its body weight at the chest level during its movements on land".

These 3 evolutions thus allow the animal to breathe with its body out of the water, whereas previous aquatic tetrapods like *Acanthostega* could not get out of the water.

As such, "Ichthyostega is the oldest known tetrapod adapted to both swimming and a form of land locomotion. It appears that it moved on land like a seal, that is, by projecting its front legs and head forward before dragging the rear part of its body. Obviously, the rear part of the body, with its broad tail capable of undulating and its paddle-like hind limbs, was aquatic in nature.

It is likely that Ichthyostega was only very partially land-based. On the one hand, its body is poorly adapted to terrestrial life, with a rather reduced mobility on land, and on the other hand, its size of up to 1.35 meters must have made it difficult to find food on land. At that time, moreover, it was mainly populated by arthropods. It is possible that the young were fed by the latter, but they were probably not enough to feed an adult, who was also very slow on land. The way of life of the animal is unknown, and one can thus only suppose the adaptive reasons of the arrival on land. This was perhaps motivated by the need for refuge from predators.

*Hynerpeton*, another late Devonian tetrapod, still very aquatic.

If the skeleton of Ichthyostega is fairly well known, other tetrapods of the terminal Devonian (between -365 and -360 Millions of years) are known by more lacunar fossils, like *Hynerpeton*.

The reason why tetrapods began to settle on land is still a matter of debate. But if it is still hesitant in the late Devonian (-360 Ma), the adaptation to the terrestrial environment becomes very assertive during the Carboniferous (-359 to 299 Millions of years).

From 360 Millions of years, the period known as the "Romer Gap" begins. This period lasted about 20 million years and was marked by the disappearance of tetrapod fossils. "In general, the phenomenon is attributed to a new global crisis, known as the Devonian-Carboniferous crisis.

The cause of the extinction could, however, be more specific. Continental drift brought the Gondwanan and Euramerican paleo-continents much closer together. The vast majority of known tetrapods lived on the latter continent. "Tetrapodomorph fishes entered into competition with Euramerican tetrapods as soon as Gondwana got close enough to Euramerica. For the tetrapods of the time, still totally (*Acanthostega*) or largely (*Ichthyostega*) aquatic, the competition seems to have been too harsh, since their lineages disappear. "Thus, it seems that none of the known Devonian tetrapod groups crossed the boundary between the Devonian and the Carboniferous. [...] However, an irreducible small group remained in a few ecological niches, where the large predatory fish did not venture. Was it the upstream part of the river systems cluttered with plants and wood? "The rare tetrapods inhabiting the Romer Gap resemble the post-Romer Gap tetrapods, which are of a much different type than the Devonian ones. Animals such as *Ichthyostega* or *Acanthostega* are thus not the ancestors of later tetrapods. A still unknown lineage obviously survived the extinction of the tetrapods 360 Millions of years ago, but took some 20 million years to fully adapt to its new terrestrial environment and to spread.

Since its discovery by Romer in 1956, this gap has been progressively filled with the discovery of early Carboniferous tetrapods such as *Pederpes* and *Crassigyrinus*.

The small group(s) that survived the late Devonian extinction gradually acquired much stronger adaptations to terrestrial life, in particular four fully walking legs, which *Ichtyostega* did not have. A first reason could be the strong competition of aquatic tetrapodomorph fishes, which by occupying the original environments of the Euro-American tetrapods would have forced the selection of the most adapted variants to the terrestrial environment, devoid of competitors.

It has been hypothesized that the young would have been among the first to colonize this environment, the adults being more aquatic for lack of sufficient food on land. If the terrestrial environments seem indeed to have been poor in food for large animals, the insects which populated them could more easily be appropriate for young of small size.

Moreover, the young are also the most vulnerable, and thus the most likely to benefit from terrestrial refuge. Even without full emergence from the water, the shallow waters near land also provided refuge for the young. Indeed, it is notable that today's young fishes (and amphibians) often spend the first part of their lives in the relative safety of shallow water, such as banks, reeds, or mangroves, where large predators cannot access.

Finally, dry land, with its complete lack of predators, may have provided opportunities for animals that had developed adaptations (lungs and legs) specific to particular aquatic environments, but reusable on land, a phenomenon known in evolutionary theory as exaptation.

One of the first well-preserved tetrapods perfectly adapted to life on land thus dates from 345 Millions of years, just before the end of the "Romer Gap", which it helped to fill. *Pederpes finneyae* was a "creature, equipped with teeth, four legs and estimated to be 90 centimeters long. [...] *Pederpes finneyae* could walk on land, but also evolve in water". "He looked like a crocodile, a little ungainly".

If not completely terrestrial, the animal is nonetheless well adapted to life on land, although it certainly still reproduced in the water. Its four walking legs (against only two walking legs in *Ichtyostega*) are fully functional. They already have 5 fingers, a characteristic of modern tetrapods, whereas *Acanthostega* had eight fingers, and *Ichthyostega* had seven.

**The appearance of the character "4 legs" is therefore a logical step in the evolution of species.**

The ancestral tetrapods are no longer completely fish, but they are not yet completely independent of the aquatic environment. As such, they still have gills next to their lungs, even as adults. The disappearance (or near disappearance) of gills in adulthood is not well documented, but necessarily dates from the Carboniferous period, during which reptiles appeared.

Beyond the most visible adaptations: lungs, legs/fin and then walking legs, choanae, ribs protecting the lungs from being crushed by the weight of the body, tetrapods also acquired adaptations essential to life in an aerial environment (even if this was only partial at first):

- the neck becomes articulated: the attachment of the forelimbs recedes, becoming disconnected from the head. The first vertebrae specialize to allow movements of the skull independent of the trunk.
- the ear (which was primitively devoted to balance) specializes to also allow hearing in the air; the development of the snout and the retreat of the
- eye sockets favor terrestrial olfaction. The enlargement of the eyes, capable of accommodation,

is also an adaptation to the air environment. They cover themselves with a protective eyelid, and a lachrymal liquid ensures their maintenance in wet environment;

- the members are strengthened and allow efficient movements in the air.

The conquest of the terrestrial environment thus began in the first half of the carboniferous period (340 Ma), but the primitive tetrapods then maintained a way of life close to that of the present-day amphibians, with a strong dependence on aquatic environments, in particular for reproduction (egg-laying). In spite of certain similarities in the modes of life (partially aquatic), of oviposition (aquatic eggs) or of breathing (gills, at least in the young), these primitive tetrapods are not however amphibians in the modern sense of the term. The taxon lissamphibia is indeed of later appearance, and carries evolutions which are not yet present in the first tetrapods. In this sense, present-day amphibians are not primitive tetrapods, nor are they even approximations of them, even if they have often retained partially aquatic characters.

The decisive feature that will allow quadrupeds to emancipate themselves from the aquatic environment is the invention of the amniotic egg, which incorporates into the egg a micro aquatic environment necessary for the development of the embryo.

This shell egg, with a liquid pocket inside, protects the embryo from drying out, even though the egg is laid in an aerial environment. This evolution is not the only one to sign the appearance of the first amniotes. It is also accompanied by a dry and relatively tight scaly skin, which greatly slows down the loss of moisture through the semi-permeable skin of the first amphibian tetrapods. The amniotic egg with a shell and the waterproof skin of the first reptiles will greatly increase the independence of tetrapods from aquatic environments, and will allow the radiative explosion of amniotes.

These two evolutions leaving few paleontological traces, the appearance of the first reptiles is somewhat difficult to date, but it is generally estimated at -320 Millions of years.

*Hylonomus lyelli*, the first clearly identified reptile, around -315 Millions of years.

*Westlothiana lizziae*, discovered in 1989 in a -338 Millions of years level, just at the end of the Romer Gap, is a 20 cm long animal, which shows clear bony evolutions towards reptiles, but it is generally considered an intermediate form closer to primitive batrachians than to true amniotes, or at least as an indeterminate species in its classification.

Around -315 Ma, *Hylonomus lyelli* is the first animal identified for which there is scientific consensus that it was an amniotic egg-laying reptile.

From this time onwards, sauropsids diversified, giving rise to numerous groups: archosaurs (including the current crocodylians and birds, but also the ancient dinosaurs or pterosaurs), turtles, lizards and snakes.

Another major group of amniotes, the synapsids (often called mammalian reptiles because of their appearance but this taxon does not include reptiles), will be the first representatives of this clade to diversify. One of the subgroups, the therapsids, will give birth to the mammals, making these animals the only current representatives of this lineage, all other groups being now extinct.

The tetrapods without amniotic eggs have not disappeared, giving rise to the three major modern groups of Lissamphibia (amphibians) which are the gymnophiones (or apodes), the urodeles and the anurans.

The common ancestor of all current gnathostomes lived in fresh water and later returned to the sea. In order to fight against the much higher salinity of marine water, its descendants acquired the ability to transform ammoniacal waste into harmless urea, and to keep the latter in the body in order to make the blood as salty as marine water, without poisoning the organism.

Eventually the actinopterygians returned to fresh water and lost this ability. Since their blood contained more salt than fresh water, they could simply get rid of the ammonia through their gills. And when, once again, they finally returned to the sea, it was not possible for them to recover the old system of turning ammonia into urea and they had to develop glands that excreted the salt instead.

Lungfish do the same: when they live in water, they produce ammonia and no urea; but when the water dries up and they are forced to dig themselves a shelter in the mud, they start producing urea again. Like cartilaginous fishes, coelacanth can store urea in their bloodstreams, as can the only known amphibians capable of living for long periods in salt water (the toad *Rhinella marina* and the frog *Fejervarya cancrivora*). These are traits that they have inherited from their ancestors. If the first tetrapods had lived in fresh water, they would have lost the ability to produce urea and would have used only ammonia, so they would have had to develop this lost ability again from scratch. However, of all present-day actinopterygians, not a single species has been able to do this, so it is not likely that tetrapods would have done so.

If they could only produce ammonia, land animals would have to drink constantly, which would make life on land impossible (a few exceptions exist, such as some land sowbugs that can excrete their nitrogenous waste as ammonia gas). This was probably a problem at first, when tetrapods began to live part of the time out of water, but eventually the urea system won out completely. For this reason it is highly doubtful that they came from freshwater (unless they first emigrated to freshwater habitats and then moved to land in a second emigration shortly after the first, when they had not yet forgotten how to make urea), although some that never went to land (or extinct primitive species that returned to aquatic life) could obviously have adapted to freshwater lakes and rivers.

There are two groups of tetrapods: the anamniotes which are amphibious vertebrates laying their eggs in water and the amniotes which are terrestrial and aerial vertebrates laying their eggs on land. Anamniotes are amphibians, the estimated number of species of anamniotes is 7302, of which 1957 species are threatened; there are 88% of described species and 41% of threatened species. The amniotes are divided into two subgroups: the sauropsids whose estimated number of species is 20463 (of which 2300 species are threatened) and the synapsids (mammals) whose number of species is 5513 (of which 1199 species are threatened). Tetra- is a numerical prefix from the Greek prefix  $\tau\epsilon\tau\rho\alpha-$  (tetra-), derived from "tessares" meaning four.

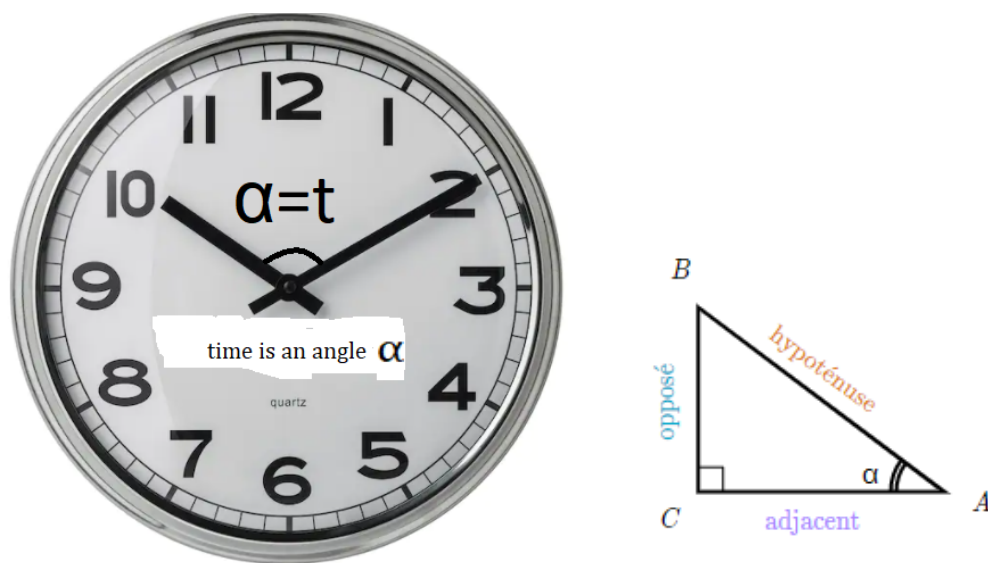
Tetra- is the form that the number four takes in composition; otherwise the Attic dialect has tettares (masculine and feminine) and tettara (neuter) and the Ionian dialect hesitates between tessares (tessara in neuter) and tesserer (tessera in neuter). Tetra comes from a reconstructed root \*kwetr (with a vowel r, distinguished when possible by a diacritical sign under the r) and the Latin quatuor comes from the same Indo-European root (in composition the Latin has quadri hence quadrilateral versus tetrahedron).

Moreover, the French linguist and hellenist Pierre Chantraine does not really explain, in the word trapeza (trapezium comes from the diminutive trapezion) the reduced form tra: trapeza means "table" and decomposes and goes back to \*tra-ped-ya (tra=tetra; ped or pod means "foot", the alternation of e with o being common in some ancient Indo-European languages; the y notes a consonant i). The word tetrapod is a doublet of trapeze of a more recognizable construction. Tetrapods are the only physical form of living species that can lead to intelligent beings by combining two essential functions:

- 2 members for the function of prehension in order to seize the food to eat it

- 2 members for the function of bipedalism which allows to stand upright.

The tetravalence is thus the only form of logic able to describe the universe in its entirety, the Ummites are obviously right, and one understands why they insisted to the GR1 group that the letter from Riyadh suggesting the use of the tetravalent logic should not be revealed because they said in addition that they do not wish to incite the terrestrial scientists to use it because that would lead to too much progress.



(a) time is an angle  $\alpha$  on a clock between the hands which give the minute and the hour

(b)  $\alpha = \arctan\left(\frac{\text{opposite}}{\text{adjacent}}\right)$

FIGURE 51: Representation of time as an angle on a clock

## 5 Definition of time as an angle

The Ummites ask themselves « it is strange that having found that a phenomenon is reduced to sinusoidal functions of time, terrestrial scientists have not predicted an angular universe.»

An angle is defined by the couple (cosine, sine) thus by its tangent provided that it is different from the right angle. We consider a temporal function of period T, we write it with its associated Fourier series.

$$f(t) = \sum_{n=1}^{\infty} c_n(f) e^{i2\pi \frac{nt}{T}} \text{ where } c_n(f) = \int_T f(u) e^{i2\pi \frac{nu}{T}} du.$$

We can  $2\pi$ -periodize a temporal function because time is  $2\pi$ - periodic because we can relate it to an angle on a clock between the hands which give the minute and the hour (see the clock) .

So we have  $T=2\pi$  and :

$$f(t) = \sum_{n=1}^{\infty} c_n(f) e^{int} = \sum_{n=1}^{\infty} c_n(f) (\cos t + i \sin t)^n. \tag{1}$$

(sum of time-dependent sinusoidal functions). Any temporal function is expressed as the sum of sinusoidal functions which depend only on time, the time  $t$  is therefore an angle  $\alpha = \arctan\left(\frac{\text{opposite}}{\text{adjacent}}\right)$ ,  $\alpha = t$  and  $\alpha \neq \alpha(t)$ .

The  $\alpha$  angle does not vary over time, it is itself the time.

Therefore  $[\text{TIME}] = [\text{ANGLE}] = [\text{LENGTH}]$  and the universe is angular, the elementary particle which governs the infinitely large and the infinitely small is the angle. Among the trillions of angles that make up matter, atoms, cells, bacteria, humans, plants, planets, galaxies, time is one of those angles. It is present discreetly like a needle in a haystack. The Ummites are right.

By using the trigonometric relation  $\cos t + i \sin t = (1 + i \tan(t)) \cdot \cos(t) = (1 + i \tan(t)) \frac{1 - \tan^2(t/2)}{1 + \tan^2(t/2)}$  for



all  $t \neq \pi + k\pi$  and  $t \neq \pi/2 + k\pi$ , we have:

$$f(t) = \sum_{n=1}^{\infty} c_n(f) e^{int} = \sum_{n=1}^{\infty} c_n(f) (1 + itan(t))^n \left( \frac{1 - \tan^2(t/2)}{1 + \tan^2(t/2)} \right)^n \quad (2)$$

and therefore for a given instant  $t$ , the temporal function is a temporal function of  $(tan(t), tan(t/2))$ , consequently, by performing the change of variable  $T = tan(t)$  and  $T_{\frac{1}{2}} = tan(t/2)$  which are known, we have  $t = \text{Arctan}(T)$  and  $t/2 = \text{Arctan}(T_{\frac{1}{2}})$  which are angles between  $-\pi/2$  and  $\pi/2$  by definition of the Arctan function. For a given instant  $t$ ,  $t$  and  $t/2$  are angles, following the same reasoning, at instant  $t/2$ ,  $t/2$  and  $t/4$  are angles ( $n=1$ ),... and so immediately, for any  $n$ : at the instant  $t/2^n$ ,  $t/2^n$  and  $t/2^{n+1}$  are angles, so that if  $n$  tends to  $+\infty$ , the neighborhood of 0 consists only of infinitesimal angles. The first moments of the universe are angles. Even considering discrete time values, we obtain an infinite number of angles because the instant half then becomes an angle, so as an angle can be considered as a periodic time, by iterating the process,  $t/2, t/4, t/8, t/2^n, \dots$  up to  $t=0$  are all angles. All past instants obtained by dyadic dichotomy are angles. At each instant, we obtain an infinity of angles. We can do the same reasoning in reverse, using  $\tan(2t) = \frac{2\tan(t)}{1 - \tan^2(t)}$ , we see that for a given instant  $t$ , we have  $\tan(t) = \frac{-1 + \sqrt{1 + \tan^2(2t)}}{\tan(2t)}$  and therefore we have for all  $t \neq \pi/4 + k\pi$ ,  $t \neq \pi + k\pi$  and  $t \neq 0 + k\pi$  :

$$f(t) = \sum_{n=1}^{\infty} c_n(f) e^{int} = \sum_{n=1}^{\infty} c_n(f) (1 + i \frac{-1 + \sqrt{1 + \tan^2(2t)}}{\tan(2t)})^n \left( \frac{1 - \tan^2(t/2)}{1 + \tan^2(t/2)} \right)^n \quad (3)$$

Thus, the temporal function is a temporal function of  $(\tan(2t), \tan(t/2))$  and thus  $2t$  and  $t/2$  are angles, and by iterating  $2t, 4t, 8t, \dots, 2^n t$  (any  $n$ ) are angles and if  $n$  tends to  $+\infty$ , the neighborhood of temporal infinity  $t = \infty$  consists of an infinity of angles; thus at any given time, we have an infinity of angles in the past, in the present and in the future. All these angles from 0 to  $+\infty$ :  $(0, \dots, t/2^n, \dots, t/2, \dots, 2t, \dots, 2^n t, \dots, +\infty)$  can be represented on a trigonometric circle and not on an oriented axis. The choice of the moment is free except for the forbidden values 0,  $\pi$  and  $\pi/4$  modulo  $\pi$ , therefore we obtain a meeting of an infinity of angles where each infinity of angles corresponds to a given moment. Therefore the magnitude "Time" comes down to an angular opening modulo  $2\pi$ . Time is a concept that accounts for change in the world. The questioning focused on its "intimate nature": fundamental property of the Universe, or product of intellectual observation and human perception. The sum of the answers is not enough to bring out a satisfactory concept of time. Not all of them are theoretical: the perceptible "experience" of time by men is of capital importance to an attempt at definition.

The measurement of time cannot be conceived as, for example, a measurement of the electric charge. In what follows, it will be necessary to understand "measurement of duration" instead of measurement of time. The measurement of duration, i.e. the time elapsed between two events, is based on periodic phenomena (days, oscillation of a pendulum, etc.) or quantum phenomena (electronic transition time in the atom by example). The generalization of time measurement has changed daily life, religious, philosophical and scientific thought. For science, time is a measure of the evolution of phenomena. According to the theory of relativity, time is relative (it depends on the observer, with some constraints), and space and time are intimately linked, to the point of partially swapping each other in several cases. According to Plato's Definitions, time is the "movement of the sun, measure of its course".

Historical time is divided into three periods:

- The past designates what an observer cannot intervene whatever one does.
- The future designates what the observer can to some extent modify
- The present which designates the junction for an observer between his future and his past.

In certain religions or beliefs, the future, project or design of a supernatural force, can determine the present; however, the principle of causation states that the effect cannot precede the cause. This principle gives an implicit definition of time: time is the order of the sequence of causes and effects. More pragmatically, historical time is measured by its concrete consequences, in particular those which make it visible by the superimposition of geological strata (see stratigraphy) or tree growth circles (see dendrochronology).

Everett's interpretation leads many physicists to consider an observer's past to be unique, but not its future. Marlan Scully's experiment raises questions about the existence or not of time at the very small scales of quantum mechanics.

Chronos (in ancient Greek: "personification of time", or "time, duration of time") is a concept that, together with Aiôn ("time, duration of life from which destiny, fate") and Kairos ("opportune moment, opportunity"), helps define time. These concepts originated with the Greeks. Chronos is the whole of time, relative to the present: "Yesterday was the previous day and tomorrow will be the next day because I am today." It is a moving point on the arrow of time which defines the infinite at its two bounds.

The notion of time is a corollary of the notion of movement: movement is the variation of things most accessible to perception. Variation exists only in duration. Thus, according to Aristotle, time is the number of movement according to the anterior and posterior.

"In the same time, in a unique time, in a time finally, all things become" wrote Alain. The human being notes in fact trivially that "objects" of all kinds are altered by "events" and that this process takes place in a time shared by all those who are aware of its course. These objects, or at least their substance, are however supposed to remain the same, numerically, despite the changes they undergo. Time thus seems to suppose both change and permanence (just as a river seems to remain identical to itself while the flowing water is never the same). Time would have as a correlate the notion of substance, which Descartes had assimilated, as far as material things are concerned, to space. These observations lead to another pair of notions that are essential to the study of time: simultaneity (or synchrony), which allows us to express the idea that, at the same moment, a possibly infinite number of events take place together, a priori without any relation to each other. Correlated with this is the notion of succession, or diachrony, (and hence, anteriority and posteriority): if two events are not simultaneous, it is because one takes place after the other - so that innumerable successive events seem to follow each other in a chain on the path of time. Two moments felt as different are thus necessarily successive. From these two considerations, it is learned that time, so difficult to imagine and conceptualize at first sight, can only be examined from the point of view of the universal individual experience: the before, the after and the same time. The lived subjective experience also reveals us the external (time "containing" or undergone, calendar or social time) or internal (time "acts" - individual - or lived, psychological or intrapsychic) characters of time. Nevertheless, from the simple succession, or from the simultaneity, the duration cannot be deduced. Indeed, when the same film is projected at a greater or lesser speed, the order of the events is preserved, but not the duration. Let us also note that the reverse projection does not correspond

to anything in the experience of time, which is irreversible.

These notions notably call upon memory, individual or collective (social: family, clan, tribal, ethnic, of a people or of a geographically situated collective): the classification of events in any order can only be done if the observer(s) remember(s), in a spontaneous way (spontaneous recollection) or constructed (effort of memory), individual or collective (collective or social memory (Henri Hubert, Maurice Halbwachs), local, popular, professional, etc.) On the other hand, memory is constructed thanks to the fact that certain events are repeated (seasons, events), thus allowing learning (individual or collective). In a more general way, it seems that time can be considered (and considering is not knowing) under at least two aspects:

- the cyclical aspect: cycle of days, seasons, life...
- the linear aspect: evolution, irreversible transformation, passage from birth to death...

While the linear and irreversible aspect was first used to measure time, for example by the complete combustion of a candle, the regularity of the return of certain events gives a more precise measure. The natural periodic phenomena allowed to establish very early a reference of duration, the calendar, and thus to quantify the time, that is to say to associate a number and a unit to him, to carry out a measurement of it. In modern times, artificial periodic phenomena have made it possible to measure shorter durations with clocks. However, this knowledge is at best that of a substance of time: it learns nothing about its intimate nature, because measurement is not time - it takes time to establish a measurement. And although the intuition of the course of time is universal, defining time itself seems beyond our capacity, probably because we are both in time, and ourselves of time (physically and psychically). St. Augustine writes about the definition of time: "This word, when we pronounce it, we have, for sure, the intelligence of it and in the same way when we hear it pronounced by others. What then is time? If no one asks me, I know it; if I want to answer this question, I don't know it". It is true that to describe time seems possible only by an analogy, in particular with movement, which supposes space. To imagine time is already to imagine it and, in a way, to miss it.

It is therefore necessary to distinguish the problem of the representation of time from its conceptualization, just as it is necessary to establish what we know about time through experience in order to better detach ourselves from it. Over the centuries, these thinkers have tried to evaluate time through meditation, mysticism, philosophy or science. The result is that although it can be rightly assumed that all men have the same intimate experience of time - a universal experience - the path to the concept of time is not universal. It is therefore only by detailing these intellectual models and their historical evolution that we can hope to grasp the first elements of the nature of time. All cultures have brought numerous answers to the questioning of time, and most of them revolve around the same themes, dictated by the human condition: the immortality of the gods or the eternity of God, the permanence of the cosmos and the fleeting life of man, are all temporal dimensions shared by most of the peoples of the Earth. They are expressed in language, in the arts... However, they do not all carry the same intimate vision of time.

The most obvious division for the observer of civilizations - before considering the anthropomorphic study of time - is undoubtedly the separation between a linear vision of time, prevalent in the West, and a cyclical vision of the temporal order, prevalent for example in India (cf. the work of Mircéa Eliade). Time is often represented in a linear way (chronological friezes). However, representations in spirals, even in circles (time is an eternal restart) can be found here marking the cyclical and repetitive aspect of human history.

In almost all human cultures, the speaker represents himself with the future in front of him and the past behind him. Thus in French we say "se retourner sur son passé", "avoir l'avenir devant soi". However, the Aymara people reverse this direction of time: the past, known and visible, is in front of the speaker while the future, unknown and invisible, is behind him.

Two conceptions of the passing of time can be perceived: either the individual is in movement in relation to the axis of time ("moving towards the resolution of a conflict..."), or it is the events that are moving towards a static individual ("the vacations are coming..."). The first is more frequent in French.

Inherited from Vedism, the belief in a succession of the same time, or rather of the same cosmic duration, is found in Brahmanism and Hinduism. The cosmos and all the sensitive world is subject to a cyclic and infinite renewal, where periods of destruction and reconstruction follow one another to give birth to the same Universe again. It is a rebirth and an eternal return. Each cycle is a kalpa, schematically divided into four ages within which the Universe gradually decays. This cyclical vision will be transferred to Man in Buddhism, through the belief in reincarnation. Man's life, in the eyes of the Buddhist, is like a kalpa, giving him the immortality of the first Western gods.

In the West, time follows a very different order and reflects a very different vision of the world. The Judeo-Christian tradition itself inherits from older mystical views, where pure time is that of the gods and deities. Human beings experience a fleeting, limited life; a veritable "nothingness" in comparison with immortality. The Bible thus presents time as a revelation, because it is God who creates it and offers its "use" to men. Although outside of time, God plays with historical times to intervene in the destiny of men, at least through his thanksgiving. God's will is thus expressed in a duality quite different from Indian beliefs: time is completely limited by Creation and Revelation, and at the same time it is considered as universal, because of its divine origin. It is also understood that Christian time, from man's point of view, is a time of hope, of promise, of expected deliverance: its very end is a return to the divine<sup>7</sup>. Conversely, the intimate time of Hindu culture is a time of permanence and introspection, in which man has another role to play in his destiny: he is, as it were, less subject to the ravages of time.

On a smaller scale, each individual relies on his historical culture of time to define his own psychological time. There is no doubt that the fisherman, the craftsman and the executive do not share exactly the same notion of daily time, because each perception is the result of its own requirements. However, the cultural bases play a very important role in the global perception of time, as a rhythm of life. Writing a story, predicting the return of a comet, listing a series of dates: each of these actions is directly linked to time. However, it plays various roles. It can be essentially a more or less explicit reference point, as in the story or the list of dates. But it can also be the object of study of knowledge. In all cases, it is essential to quantify it in order to approach it in detail, whether this quantification is figurative or precise and effective (carried out with a measuring instrument). It seems that time offers itself to the human being first of all as an ambiguous object, whose measurement makes it possible to create reference points, but not to define it completely. Asian cultures have cultivated a taste for a mystical time, both fleeting and perpetual, illustrated for example by the Japanese haiku: the notion of flow is preponderant. At the same time, South American peoples such as the Incas have favored a ritual dimension of time, where discontinuity prevails; this is also the case in the Muslim tradition. For all that, all these approaches rest on the same intimate sensation: it is thus even more evident that what man has known of time throughout history has not been time for itself, but some cultural manifestation made possible by a particular singularity of time, given by certain aspects only. All these "unconscious" traditions will have a significant influence on the developments of the concept of time, whether in science or in philosophy.

They manifest the beliefs of a people at a given time, and the way in which these beliefs translate the feeling, the experience through the imagination. The finer and more conscious the confrontation with time, the more complex the conceptualization of time will be: indeed, a strong characteristic of time in the first ages of reflection was its direct and exclusive link with the divine. Over the centuries, this link will become more distant and will even be rejected by some.

Modern and industrialized societies are significantly changing the cultural and traditional relationship to time. Even where myths and religion endure, everyday time is under attack from the instantaneous: media, food, travel... all daily acts are accelerating, so that the constraints of time are less felt - or on the contrary, become more glaring when the facilities fade. Whatever the advantages or losses caused by this sometimes brutal mutation, cultural time has never been and is not the time of the economy. Slowness is a fundamental characteristic of the rhythm of human societies: it is perhaps the force of inertia which ensures their cohesion. Time of reflection and time of action enter in competition and distort each other, to the point of sometimes breaking down the psychological reference points. Thus, it is noted that urbanized areas, where personal time is very often sacrificed on the altar of constraints (to go faster, at a different pace, and all that this presupposes and entails) are the hard core of the consumption of psychotropic drugs. In its accelerated development, humanity is taking the risk of permanently altering its relationship to time. Time is oriented: it flows from past to future. Thanks to the deep feeling of duration, the human being can act, remember, imagine, put into perspective... so much so that time is essential to him, and therefore, commonplace. The level of complexity of the relationship to time is fairly well translated by language, although imperfectly: certain primitive cultures have few words with a temporal meaning, and are essentially situated in the present and the past. For the ancient peoples of Mesopotamia, for example, the future is "behind" and the past, known, is placed "in front". As soon as a people becomes interested in the future, however, this intuitive order is reversed: time is expected to bring us the next moment. This constitutes a first confusion between time and movement. The simplicity of this relationship quickly fades: soon, man tries to play with time. To "lose one's time" or "to take one's time", or any other expression in any language, translates the age-old will to gain control over this time. All in all, it is still a falsely spatial conception that is at stake: to be able to act on our intimate arrow of time, to stretch it, to distort it, to bend it. But time remains true to itself, and its rigid dimension is also tenaciously exploited, by the quest for the right and precise measure. Quantifying, here is another way of describing time which was engaged very early. Although privileged by the sciences, it is nonetheless a source of amalgams and deception that are always renewed. Thus, to count time is not to grasp it in itself, because the action of counting time presupposes time. What is this "real" time that measures time, the one invoked by the joke "let time do its work"? This question has left whole generations of thinkers speechless; modern disciplines try to answer it by exhibiting a plural time, physical, biological, psychological, but the time of the obvious truth does not seem to have come yet.

To think about the concept of time, human beings rely on their language; but words are misleading and do not tell us what time is - worse, they often dictate our thinking and clutter it with semantic prejudices. The paradoxical dimension of temporal language is not very complex: it is enough to linger on a simple common expression such as "the time which passes too quickly" to realize it. This expression designates a time that is accelerating. But acceleration is still a (spatial) position derived (twice) with respect to time: the unchanging "framework time" reappears! Time is neither duration, nor movement: clearly, it is not the temporal phenomenon. It is not because events are repeated that time is necessarily cyclical. This step back, distinction between time and phenomenon, will be relatively effective in the course of the history in sciences and perhaps less in philosophy, sometimes

victim of semantic appearances.

However, by distinguishing time and the events carried by it, an embarrassing duality arises: in which reality should we place these phenomena that occur, if not in time itself? The wise man will say, in the "course of time". This animated scene of phenomena is seductive and right, but we must beware of the semantic trap. The course of time is what many have represented in their schoolbooks by the arrowed line: beyond the misleading amalgam with movement, there is the idea of causality, and also of constraint. The course of time illustrates the sensation of imposed chronology, which is a property of time for itself. Nothing here yet indicates the idea of change or variation. It is truly a framework, the Chronos - the becoming made possible by Kronos. Man, for his part, becomes, and the phenomena, them, occur. This is the business of the arrow of time, which models the transformations in the course of time, or rather, "in the course of time". It is a property of phenomena.

These two notions are important and non-intuitive - they are mixed and blurred by language into a single whole, a false primary idea of time. Science, in particular, has relied on them to build several successive visions of time as it progresses. The instant is the product of the projection of the present in the successive series of times, that is to say that each instant corresponds to a past present. The present itself is however in its turn an abstraction, since nobody lives a pure present, reduced to a null duration. The past is the accumulation, or rather the organization of previous times, according to chronological (succession) and chronometric (relative durations) relationships. The future is the whole of the present to come. Only the contents to come, the future events, are likely to be modified again. This is what makes the future not yet.

Time presupposes change, but these changes can only be integrated into the thought of an object if one posits a substance under these changes. The Greeks, unlike the Hebrews, were alien to the idea of creation. The cosmos had always existed, time was inseparable from astronomical cycles, matter, underlying the forms, was eternal and uncreated. If the forms were also eternal, the information was fugitive, at least as far as the physical world in which humans live, as opposed to the sky, was concerned. "Ephemeral" is the word the Greeks used to refer to the condition of men. Men appear to disappear, "like shadows or smoke" writes Jean-Pierre Vernant. They lack consistency, of being. Etymologically, indeed, is ephemeral what lasts only one day and fades away immediately in death and oblivion. For want of gaining eternity, reserved for the gods, the ancients undoubtedly wished to gain permanence. Unlike Eternity, permanence is not outside of time. What is permanent in the strongest sense of the word is that which will always last, or even that which has always existed. At first sight, permanence is therefore confused with time itself. "Permanence generally expresses time, as the constant correlative of all existence of phenomena, of all change and simultaneity. Indeed, change does not concern time itself, but only the phenomena in time", writes Kant. In a weaker sense of the word, what we have "always" seen and will perhaps "always" see is permanent. "Where were you when I founded the earth?", Jehovah answers Job. Permanence is thus the primary attribute of what we can inhabit, of everything that allows us to organize existence and give it meaning. It is what is called the world, what constitutes the universe. It is not only a physical or institutional framework, but also the continuity of a civilization or values and representations that we take for granted. All these elements form permanence as a self.

As Hannah Arendt remarks, the distinction that Aristotle makes between fabrication and action must be linked to the transience of human existence. The manufactured thing is indeed the product of a human activity, but it survives it, it is integrated as soon as it is manufactured into this world that we inhabit. On the other hand, the action, as admirable as it is, is eminently transient. Only, it is basically the same for the whole of life. Time seems to crush us completely, to play with our

destiny. However, according to Epicurus, there is no incompatibility between the fleeting nature of our existence and happiness. When our life is over, we have the privilege to take it back as a whole. It does not matter if there is nothing left of us after death: we will not suffer from it any more than if we had not been before we were born. The old man must know how to enjoy the story of his own life, when it has been successful. "It is not the young man who should be considered perfectly happy, but the old man who has lived a good life. For the former is still often exposed to the vicissitudes of fortune, while the latter finds himself in old age as in a harbor where he has been able to shelter his goods."

Closely linking human existence to narrative helps us not to confuse duration with nothingness, nor with the instant. Duration is the condition for the unfolding of a story. It supposes the flow of time, and this flow itself remains, whereas one cannot represent the pure instant, infinitely brief, if not by making of it a kind of immobile photographic snapshot, out of time.

Yet, notes Henri Dilberman, death is more than a simple limitation. For example, the spatial limit does not abolish the space it encloses. On the other hand, my past life still exists only if I remember it. Death is precisely the forgetting, and thus the annihilation of what I was. Vladimir Jankélévitch reminds us, however, that we all have this melancholic viaticum for eternity: failing to be always, nothing will make us not have been.

Thus, according to Vladimir Jankélévitch, "L'avoir été" is a spectral form of the being that we have been, the ghostly becoming of our past. To make it a being, to give it a reality, to give in to its attraction, is to confuse space and time. Soothing and voluptuous, music also bears witness to this "almost nothing" - eloquent presence, purifying innocence - which is nevertheless something essential. Expression of the "exalting plenitude of the being" at the same time as evocation of the "irrevocable", music constitutes the exemplary image of temporality, that is to say of the human condition. Because the life, "parenthesis of reverie in the universal rhapsody", is perhaps only one "ephemeral melody" cut in the infinity of the death. But this does not mean that it is meaningless or vain: for the fact of having lived this ephemeral life remains an eternal fact that neither death nor despair can annihilate.

If Epicurus did not care much about not being soon, his case is exceptional, writes Arendt. The Greeks sought to immortalize their actions through glory, the condition of which was a brief but heroic life. They were haunted, she recalls, by the saying that no one passes for happy until he or she is dead: indeed, there is no guarantee that we will not end our lives ignominiously. Only the Men who will survive us will be able to say if our life was successful or not, because only they will be able to consider it as a whole, to tell it and to draw the lesson from it. The narrative would allow us to ward off the impermanence that time confers on existence. To read the paradoxes of Sextus Empiricus, the temporal dimension of the states makes it possible to deny them all, as well as the knowledge that claims to relate to them. Augustine will take up the skeptical themes, but to make of them the instrument of faith! What has been is no longer, what will be is not yet, the present is only the limit of these two nothingnesses. Time is less a dimension, or a framework, of the being than its negation. Saint Augustin, asked himself above all the question of the utility of time for the men. He notes that the knowledge of time escapes us, but this is the work of God: only the good human being will be able to transcend the time undergone, at the side of God, after his death. Thus, Saint Augustine insists on more anthropocentric notions of religious time. Time is only insofar as it is present. The present of the past is memory, the present of the future is expectation, the present of the present is perception. Time is no longer defined as a measure of cosmic movement, but as a psychological entity. It is a distension, probably a distension of the soul (*distentio animi*). This is at the same time subjectivizing time and sending it back to God, his

revelation, his mystery. The Christian must use the time granted to him with justice and piety in order to enrich his finitude, and to move towards Christ in a movement of hope. For Newton, time is, for example, a continuous flow. As is often the case, the analogy with motion - widely exploited by philosophers of all periods, at various degrees of abstraction - allows us to shed some light on the concept of time.

The continuity of a movement is not an easy thing to imagine. Zeno, in his paradoxes, had brought to light the duality between the finite movement and the infinite time of the journey. Indeed, the first intuition of motion is that of a spatial transition, continuous, between two points of space separated by infinite intermediate positions. In an analogous way to the infinite succession of whole divisions, space seems according to this description to be an infinite continuum. However, the movements perceived by our senses do take place in a finite time! Zeno explains that everyone will find it difficult to imagine how an infinite number of positions can be traversed in a finite amount of time. To imagine leaps in a space of points separated by a vacuum to define motion, as the Pythagoreans did, is not satisfactory, because it would lead, for example, to admit a uniform speed for all motions. A slower motion would be a longer motion, and a faster motion a shorter motion. We can, as a first step, conclude with Russell that "the continuity of motion cannot consist in the occupation by a body of consecutive positions at consecutive times".

Zeno is not merely detecting a paradox here. He knows as well as we do that Achilles will catch up with the tortoise at a given time, and shows that it is the fact of describing the problem in this way that prevents it from being solved. In contemporary language, we would say that he defines a finite value by an infinite algorithm.

The whole problem of time, and of space, lies here in the difficulty of imagining infinitesimal quantities. This is not a shortcoming: it is precisely that there are no infinitesimal distances, but an infinity of finite distances. To solve the paradox of motion in space, we must imagine that time is also conceptualizable in an analogous way: there are an infinite number of finite durations in the course of a motion, but no "infinite duration". If we imagine cutting a finite distance in two, and then cutting one of its halves in two, and this indefinitely, it follows that the smaller (and finite) the distance, the shorter (and always finite) the time needed to travel it. The progression of series of infinite terms, the compact mathematical series, illustrates this mechanism of thought. It is not important here to know whether this model corresponds exactly to the physical reality of the world: it is enough to advance that it illustrates it faithfully, that it translates it correctly. The reasoning of the compact series is the simplest that can be imagined and that corresponds closely to experience. It leads directly to the idea that we must consider, at least theoretically, instants without duration, which support moments and durations, and thus the whole of time. This philosophy, attached to the modern scientific thought but not exclusive to it, did not make the unanimity. Thus Bergson defended the idea of an indivisible movement and time, irreducible to a series of states. Indeed, perception is unthinkable if one does not admit that I perceive the past in the present, what has just happened in what persists. The pure moment is thus an abstraction, a view of the mind. Pushed to the limit, this doctrine is nevertheless opposed to daily experience, in the straight line of the Pythagorean vision of the world. We [who?] can consider a line, an area or a volume as an infinite group of points, the essential point is that we cannot reach all the points, enumerate them, count them, in a finite time - for example, the successive division into equal halves of a distance can well be repeated ad infinitum: it is therefore impossible to reach any end in this enumeration of divisions. We can quote Bergson: "How can we not see that the essence of duration is to flow and that the stable added to the stable will never make anything that lasts? (The thought and the moving, p.7). The knowledge of time gains in precision by these



remarks drawn from the mathematical theory of space, because for man it is easy to mix time, infinity and eternity in one and the same fuzzy idea. Kant, for whom time was an a priori form of (internal) intuition, and not a concept, distinguished between unlimited time and infinity: "The original representation of time must be given as unlimited. Time is not in itself infinite, but it is that it does not exist in itself. It does not have either a beginning. We always perceive a previous instant, but it is us who introduce in the experience this regression. Time is therefore neither infinite nor finite, because it is not a being but a form of our own intuition. Things in themselves are neither in time nor in space. If we gauge the idea of time by our impressions, it seems to us that it is sometimes fleeting, but equally endless; it is obvious and at the same time elusive, as Saint Augustine noted: everyone has experienced these contradictions of appearance. They are amplified by language, which by the word "time" designates everything and its opposite. But to know the infinite character of time is already to know time as it comes to us - and to seek a transcendental truth beyond this notion of infinity is perhaps quite vain. It would not be enough to conclude that infinity characterizes time in an essential way, because we do not have a better knowledge of infinity and the concept of infinity is not that of time! Returning to the problem of infinity in space, we can see that "from Zeno to Bergson, [a long line of philosophers] have based a large part of their metaphysics on the alleged impossibility of infinite collections." However, it has been known since Euclid and his geometry that numbers express so-called "incommensurable" quantities (the irrational numbers, formalizing an idea that allowed the Pythagoreans to create philosophy by taking note of the intrinsically irrational nature of certain numbers, but especially of the universe itself. Some elements resist simple measurement and are placed on another plane. What about time and the idea of the immeasurable? Can the measurement of time give us the keys to the understanding of time, as we hope since the most ancient times?

A return to Zeno can give some clue to reflection. His paradoxes, which also concern time, are based on several axioms - mainly the belief in a finite number of states to characterize phenomena, whether in terms of space or time: finite number of points in space, etc. These paradoxes lead to several metaphysical "solutions": one can reject the reality of space or time (Zeno seems to have done so, at least for time and in theory, so that he was in a way caught in his own trap); one can also decide to stick to Zeno's premises and consider that time is absolute and indivisible, as in Bergson's case, with the difficulties of returning to experience that we know and that led to the fall of classical mechanics. One can finally consider that the very bases of the paradoxes are false, and study the possibility of infinite collections, as we have also seen with compact series. Russell exposes the error of reasoning which, according to him, characterizes the Kantian doctrine, but which is not exclusive to it. Kant did not want to admit the possibility of an infinite in act, he equated infinity with an unlimited regress. The infinite was only in power, and supposed a subject. Thus, natural numbers are infinite, but only in the sense that the subject never reaches the greatest integer. According to one branch of the Kantian antinomy, which cannot be confused with the Kantian solution itself, the past must have a beginning in time, because, according to the other branch of the same antinomy, assuming infinite time, how could we have arrived until today? An infinite time could not indeed have elapsed entirely. Of course, in an analogous way, the future is bounded by the present moment, and extends over the course of time, but this poses no problem for Kant, because the question of the future is not symmetrical to that of the past. The future is not yet. Its infinity is "in power", not in act. The future is unlimited, but not infinite in act. Kant's tour de force will be to apply this reasoning to the past itself. It is the subject that always regresses to a previous past, in order to explain the present. The series does not exist in itself, it expresses the nature of our perception. It is us who carry with us the form of time, it is not a dimension of

the Being in itself, otherwise unknowable. At least one aspect of the problem of the infinity of time can be answered by leaving aside the question of the flow of time, and by assimilating it to space. Is it impossible for a collection of infinite states to be complete, as the philosophical tradition following Zeno suggests? We can answer in the negative by a simple argument that follows from compact mathematical sequences, but that can be found just as well in philosophy. The decisive point is that an infinite sequence can be bounded, as the careful examination of the past, present and future gives us the clue. It has a beginning, and no end, but there are values superior to it. Thus, the unit is superior to an infinite number of whole fractions which are all inferior to it. This sum has an infinite number of terms, and yet it is well anchored in a discrete framework.

This is because counting durations will never allow us to grasp time as a whole, just as counting the elements one by one of a series of infinite terms will never allow us to grasp its essential idea. Thus, time is dependent on other aspects of which we are also aware, and it is its relationship with space and matter that constitutes the "ontological" envelope of our macroscopic universe. This metaphysical doctrine fits well with the theory of relativity, which has modified the metaphysical idea of a unique time, because it suggests that time is a property of a frame of reference, and not what it would be in. Space-time is not only a scientific notion, far from it. This vision of the world is not in fact fundamentally opposed to those that prevailed with Kant or Newton: it is simply a matter of putting time back on its own level, of giving it a consistency of its own. In the same vein, Francis Kaplan takes up this definition of time as the multiplicity of a unity and space as the unity of a multiplicity. Like Kant, he considers that these two notions are subjective. Time having no material existence, he privileges the notion of temporality to that of time. If time is better described and understood at the end of these progressions, it is however still not known essentially.

Scientific conceptualization

Detailed articles: Time (physical) and Biological time. The time of science refers largely to its philosophical conceptualization, both because of the questions that rational study raises, but also because of the progress it brings: progress in measurement, progress in perception. If it is true that the essence of the scientific relationship to time lies in its representation - which scientists always wish to be better adapted and more precise - the history of the "time dimension" teaches us much about the essence of time. The concern to give it an objectivity of its own has led scientists of all periods to consider its study with great pragmatism.

However, from the "instantaneous" time of Newtonian mechanics to the dependent and parameterized time of the theory of relativity, closely linked to space, it is a real revolution by distancing that has occurred in the scientific field. Albert Einstein introduced in 1905 the new notion of space-time in a framework that will become special relativity. This notion was taken up by Hermann Minkowski in what is now called Minkowski space.

Thermodynamics, on the other hand, highlights the essential notion of the "arrow of time" as it appears in physics and biology. According to Ilya Prigogine, there must be two kinds of time: the reversible time of physicists and the irreversible time (arrow of time) of thermodynamics (and of biology).

But one cannot discard the mathematical conception that introduces this "mathematical being": time ( $t$ ), which is indispensable to express fundamental notions such as speed and acceleration as we perceive them by the senses, and which is therefore foreign, and sometimes even opposed, to any philosophical conception. Mathematical time and physical time are linked by the renunciation of the notion of period in favor of cycle in phase space.

The modern vision of time is thus paradoxically both more anthropocentric and more distant from the human being than the one that prevailed until Newton. From the Ancient Greeks to Kant, it

was necessary to decide whether time was within or outside of us, but always from our point of view: now science proposes a time existing for itself! But this time is dependent on other realities, first of all space and matter - and we live precisely in space, through matter. Time is thus viscerally acquired for us but partly masked. Through the examples of time arrows, we also realize more easily why our intuitive understanding of time is oriented, from the past to the future. However, where science has made time a creative element, man continues to suffer time and its ambiguity, as an unfortunate victim of solipsism.

In fact, from anthropocentric time drifts in the thought of some moderns on the ground of anthropomorphism. The human being has a schematic vision of time, between past, present and future: the reasons are now known. But if we understand why our consciousness dictates such a representation in the face of experience, it is more crucial to ask ourselves why time presents itself to us in the light of the "arrow of time". When we give time the image of an arrowed line, it is its course that we represent. By crossing this line with a perpendicular to mark the present moment, partitioning past and future in two psychologically hermetic compartments, we represent the becoming. However, the present is fixed, by definition. The present moment calls for nothing but itself, but here it is already chased by another moment, which immediately replaces it. On the arrowed right of time, the bar of the present moves in spite of itself: what is this engine of time? One approach among others, which contradicts the most recent conclusions of scientific origins (from the field of physical science, at least), places Man as the involuntary machinist of chronology, a thesis already defended by Hermann Weyl at the beginning of the 20th century. If we consider that time is the ultimate framework of reality, pre-existing to all things, then we make indeed a false idea of him, by attributing him our own historical movement. Immutable, "crawling in it" to catch up with an already written future, we are the battered consciousnesses of a complete determinism. Strangely, this vision is close to that of Arthur Eddington, who introduced in 1928 the term "arrow of time" - he presented the idea in a very different light from its current meaning, and perhaps, in a certain conceptual confusion between course and arrow of time.

One can just as easily take the opposite view of this doctrine, by arguing that nothing indicates that "pure" time must be thought of in terms of the present, that the past and the future are such only from the point of view of man, not from that of the absolute. According to Henri Bergson, if time in itself is a kind of unfolded fan, a film whose successive images are actually juxtaposed on the reel, it is no longer time, it is space. And if I crawl towards the future, I am in time. Time does exist, at least in me, it is not just an illusion. Or is it necessary to suppose that I pass from an eternal state of myself to another, while having the illusion that under the Mirabeau bridge everything flows and I remain? But what is this mysterious I who transits thus from a state of myself to another? Or again, why the one I was yesterday, if he still exists in the spatialized past, is he still not me? How did the relay take place from one to the other, if not in duration, this lived time that, according to Bergson, rebels against spatialization? Why not admit then that the cosmos is carried by the same movement? It is true that by proceeding in this way, one attributes to time a forward march which is perhaps only a cognitive development proper to the human being and to his finitude. It would therefore be presumptuous to try to settle the question of the nature of time here. On the basis of the informal "History" of time, each consciousness can decide to align itself with one or the other of the representations of the world, or to prolong the reflection on the always renewed ambiguity of the concept of time.

As previously explained in terms of measurements, an essential problem has consisted (and still consists, for example in quantum physics) in choosing the role that time will play in a system of laws. The way in which the concept of time is thought of has a very strong implication on the

overall result: time can be an immutable parameter (classical mechanics), or a quantity malleable according to the phenomena (general relativity). It can be given a priori or constructed, in order to bring a tailor-made answer to a problem. But whatever the conceptualization of time, the problem of its measurement remains. Trivially, man has a weak experience of time compared to the concepts he can imagine to define it: he simply has the intuition of a time that flows, and it is not surprising that he has sought to use this property of his universe as a reference point. This implies being able to measure time, and therefore to quantify it.

Paradoxically, time is a very simple object to measure. It is of dimension one: to express a date, a single number is enough. This is obviously not the case for three-dimensional space. However, this singular property of time implies a first complexity: should time be represented schematically by a straight line (linear time) or a circle (cyclic time)? Physics, and cosmology in the first place, has brought the notion of the arrow of time, thus of a linear time, but it was not always so. The Eternal Return and the Golden Age are illustrations of the belief in cyclical time.

For the first measurements, two different approaches coexisted:

- one can create landmarks, mark moments; A trivial way to measure time in this way is to simply count. The ability to sequence the course of time by regular intervals is certainly the mark of a deeper property, but it is especially its applications that are interesting here.
- One can also decide to create limited durations, using for example a finite quantity. Thus, in Ancient Greece, the time of speaking in the Agora was measured fairly by the flow of a well known quantity of water in a clepsydra.

In fact, the two ways of doing things come together, because marking two distinct moments amounts to updating the intermediate duration, so that the heart of the problem is none other than this: a "basic" duration could possibly be defined by a unit of measurement.

Since the standards set by the ancient Egyptians and Chaldeans, the calendar and time measurement system is as follows:

- each complete revolution of the Earth around the sun counts as one year (solar calendar) or each lunation counts as one month (lunar calendar). In the current civil calendar, the division of the year into twelve months partially overlaps with the lunations, although with a few days difference.
- The duration of the earth's rotation around its axis counts as one day. There are currently about 30 days per month, and 365 days per year (a leap day being periodically added during leap years to take into account the astronomical shift)
- the duration of a day is divided into 24 hours.
- the duration of an hour is divided into 60 minutes.
- the duration of a minute is divided into 60 seconds.

The original choice of the duration of the second is probably based on the time between each heartbeat at rest, measured by trial and error at the time (in reality, it varies according to age, and is rather 70 beats per minute on average). The choice of the bases 60 and 24 is explained by the fact that they are both multiples of twelve, the traditional division of the day adopted by the

ancient Egyptians.

In modern times, since 1967, the second is defined from a physical phenomenon which is at the base of the concept of atomic clock: the time necessary for a well-tuned light ray to perform 9 192 631 770 oscillations. This well-tuned light beam used to define the second is the one whose frequency causes a well-determined excitation of a cesium-133 atom (transition between the two hyperfine levels of the ground state of this atom). This means that in one second, there are 9 192 631 770 periods of this atomic "pendulum" or atomic clock whose clock frequency is close to 10 gigahertz. Thus to measure 1 second it is enough to know to produce this emission and to measure its frequency. This emission could, by its wavelength (3.261 226 cm), give a unit of length since it takes  $30.6633 = (9\ 192\ 631\ 770/299\ 792\ 458)$  spatial periods to make a meter. This emphasizes the fact that, according to current knowledge, the speed of light in vacuum is constant and independent of the reference frame, and is in fact the "natural" standard from which the time standard and the length standard are derived.

In fact, according to the current knowledge of quantum mechanics, the light rays that can be absorbed by a given type of atom always have the same frequency, for a given excitation (transition). And according to the current knowledge of general relativity, this measurement will always be the same for an observer who is immobile with respect to the atoms in question.

Before the decision of the General Conference of Weights and Measures in 1967 to define the unit of time in terms of an atomic phenomenon, time was for a long time defined in terms of phenomena of astronomical origin. The second is historically derived from the day (which is related to the period of revolution of the Earth on itself<sup>14</sup>), which is subdivided into hours, minutes and seconds. The coefficient 9 192 631 770 of the above definition aims at giving the second its historical value. But in fact, modern science has shown that astronomical phenomena such as the duration of the rotation of the Earth on itself, or the revolution of the Earth around the Sun, do not have a constant duration, and are therefore not a good support to define a unit of time. For example, the rotation of the Earth on itself slows down (very slowly), in particular because of the tidal effects of the Moon. Similarly, the orbit of the Earth around the Sun changes with time, because the Sun tends to lose mass due to its surface radiation (equalized by the nuclear reactions that take place in its center) at the rate of 4.3 million tons/s, plus its "solar wind" of about 1 million tons/s.

The realization of the first atomic clock in 1947 allowed the adoption of the known definition of the second, which is more rigorous, from a scientific point of view, than the historical definition based on astronomical phenomena.

Most modern clocks (watches, computers, etc.) use quartz crystals with a stable oscillation frequency to define their time base. The frequency used is almost exclusively 32 768 Hz ( $2^{15}$ ), which allows to obtain very simply the second. These small quartz crystals in XY section are called "watchmaker quartz".

The times defining the durations necessary to carry out a task in a factory are generally measured in hundredths of an hour (ch) or decimilli hours (dmh). These various needs explain the options of modern chronometers.

Time is an essential parameter in computing. Indeed, computer processing requires time, both for data access processing (input/output or I/O), and for processing calculations and data formatting (CPU time, Central Processing Unit). The necessary computing resources are a combination of these two types of processing. In scientific computing, the predominant processing is computation time. The accesses are limited to the research of the calculation parameters. In business computing, the predominant processing is access processing, in other words input/output. The calculation times (CPU) are most often limited, except for end-of-month processing which often involves large

volumes (accounting), as well as backups.

In industrial computing and embedded computing, processing is essentially carried out in real time. In business computing, it was customary to distinguish between batch processing ((en)batch, or deferred response, Rd in initials) and transactional processing (or transactional processing, or TP in initials, or instant response, or Ri in initials), depending on whether the processing was carried out some time after the data entry, or immediately after the entry.

Before the appearance of modern computing, at the time of mechanography in particular, the techniques available only allowed processing to be carried out in batch, using punched cards. The appearance of modern multi-tasking computers first allowed the simultaneous processing of several different tasks on the same computer, then the real-time processing with keyboard input coupled with a monitor allowing to display the input data, then the result of the processing. The so-called passive terminals, exclusively used until the 1990's, before the appearance of microcomputers, required real-time processing on a remote computer (mainframe, computer under Unix). The advent of microcomputers has made it possible to execute certain processes on the user's workstation, thus in theory limiting the amount of access time due to remote communications.

The most common batch processes are long and difficult to divide, such as accounting tasks, payroll calculations, interfacing processes, complex controls and backups. They are generally performed periodically. Processing periods can be daily, monthly, yearly, or sometimes weekly.

In the client/server system, the real time processing time depends on the processing time on the microcomputer, the time it takes for the information to travel over the network (local/LAN or long distance/WAN), and the processing time on the central computer. The processing times are largely dependent on the computing power and especially on the memory available in the computer. The travel times on the network are dependent on the capacity of the line.

Today, the traditional distinction between real time and batch tends to evolve: the technical possibilities (memory, storage capacities, capacity of the telecom lines) have radically changed the deal. The Ri/Rd notation (instantaneous/delayed response) from design methodologies (MERISE) is no longer as interesting. The choice between real time and batch is most often imposed by the ERP designer. The discriminating character of the choice between real time and batch is no longer the same. For a long time, technical capabilities dictated the choice of processing mode. Batch processing is still necessary for voluminous processes or those requiring controls that are impossible to perform in real time. There is also often a question of synchronous or asynchronous processing. The treatments carried out on the Web are most often carried out in real time and remotely. There are still constraints on the consistency of the information entered, so that this information complies with the business repositories, the accounting repositories and the ever-increasing legislation. These constraints are expressed in an even more complex way, and can no longer be managed by controls carried out a posteriori in each application, but by the constitution of repositories or standards, and by the management of data and documents in communities (forums, groupware, shared workspaces...).

With the Internet, the logic of real-time processing with partners requires more and more interoperability between software from different domains. This interoperability is ensured, in the markup languages, by the intermediary of special data, among which we find the date.

The artistic creation can be assimilated to the synthesis of the making and the action in the sense of Aristotle, that is to say, in the vocabulary of Wilhelm von Humboldt, of the creative energy (*energeia* in Greek) and the product (*ergon*). To appreciate a work of art, it is at the same time to consider it as a reality distinct from the artist, possessing the ambiguity of the things, and to find there the living power of the imagination, the feelings, a vision of the world. The work confers the

permanence of the thing to the fleetingness of the inspiration and the gesture of the artist. This tension between Apollo and Dionysus is found in the rivalry between classicism and romanticism, or formalism and expressionism. In a nod to Bichat, André Malraux defined the whole of culture as the set of forms that resist death. To tell the truth, remarks Jean-Paul Sartre, if the work of art survives indeed to the artist, one would not know how to confuse it with a thing, that is to say a reality which remains independently of the human imagination. It is because we contemplate a painting that it is more than pigments spread on a canvas.

Some cultures see in creation only the dynamic aspect, the pure act or inspiration, and do not care at all about the durability of the drawing or painting. In India, for example, all life is transition: everything is caught in a perpetual cycle of creation and destruction. Art is no exception. It is true that it is mainly a question of communing, through an object, with the spirit of some deity. Apart from this sacred moment, the work is only a deserted receptacle. It will have served above all to connect the artist's soul to the divinity, in the manner of a prayer.

Benedetto Croce underlined however that there is art properly speaking only if the creation continues in the contemplation. To contemplate, it is not to coincide with the artist's affects. Art is not of the order of the immediate feeling, which does not mean that it is a frivolous and cold game. Art objectifies feelings as well as ideas. Anger fades away as it spreads. But the artist gives to see it, gives to see the passions, the impulses of the heart, concepts metamorphosed in the form or the rhythm. He puts them in the past tense in a way. Alain writes about music that it is neither happy nor sad. "One sometimes calls melancholy, for lack of a better word, this state where one contemplates one's own misfortunes, and all misfortunes, as objects which pass and are already distant; music figures marvelously this memory and this oblivion together."

Thus, the aesthetic contemplation does not consist only in appreciating a form withdrawn from time. It frees us from the urgency of the moment, it allows us to contemplate the human condition from afar, or from further away. It was also the *raison d'être* of tragedy: to contemplate the misfortunes of man from the point of view of destiny, in a movement of withdrawal with regard to time.

In music, time is the main parameter of music, one of the rare arts to be inscribed in a temporal evolution and to create a time. The differentiation between subjective time and objective time plays a primordial role, since the emotion procured is measured in terms of this subjective time of active listening, a time that cannot be quantified, and which is the subject of several psychological researches. Several contemporary composers, like Arvo Pärt, Pierre Boulez, José Manuel López López and many others, have sought forms of writing, musical processes to suspend this subjective time, to inscribe the lived time in a controlled dimension.

In the *solfeggio*, time is a subdivision of the measure and suggests the dynamics to bring to the interpretation (strong time - weak time).

The observation of children's musical behaviors allows a slightly different approach. Music, in its "concert" practice, implies a common time. It is a time that is both practical and formal. One of the thinkers of the *Ars Nova*, in the thirteenth century, Francon of Cologne, brilliantly expresses this idea: *Tempus* is the measure of the music emitted and the music omitted. Observation highlights the construction of this formalized time by children, who pass from egocentric activity (in the Piagetian sense) to a practical time, based on the concrete, perceptive and active which produces it, then to this formalized time which allows interactive, complementary activities. This level is hardly reached before the sixth year.

The movie "The Age of Adaline" shows us the dream of every person: to escape the ravages of time. After an accident that should have been fatal, the beautiful Adaline stops aging. Today, despite having lived for almost eight decades, she is still 29 years old. After leading a solitary existence



so as to never reveal her secret, a chance meeting with the charismatic philanthropist Ellis Jones, will rekindle her passion for life and love. Who hasn't dreamed of stopping aging and becoming immortal? That's what happens to Adaline in Lee Toland Krieger's 2015 film of the same name, starring Blake Lively in the title role. What if the dream isn't really a dream? Adaline Bowman has a very normal life: she married the man she loves and is the mother of an adorable little girl. Now a widow, she is the victim of a car accident that has an unexpected effect: on the verge of drowning, she is struck by lightning and stops aging. From 1938 to 2015 (the year in which the film takes place), she will not exceed 29 years of age, seeing her daughter marked more quickly than her by the years... After a few setbacks with the police following a speeding ticket, she decides to move and change her identity every 10 years to avoid attracting attention, not taking the time to get attached to anyone or anything - except her dog, and her daughter, the only one to know her secret.

If the use of the flashback is not very original in the cinema today, it is the repetition of this process that marks Adaline. We will mention, of course, the long jump in the past telling the story of Adaline's accident and the years that followed, until her decision to move for the first time. It was necessary to contextualize the plot in order to understand why the young woman now calls herself Jennifer Larson and associates with counterfeiters... Other snippets of her past will appear



thereafter regularly, illustrating what led Adaline to make certain decisions in the past. Perhaps the most interesting flashback occurs when the young woman, now Jennifer, decides to flee the city when she starts to get attached to Ellis (Michiel Huisman), but refuses to do so. In a cab, she stops in front of a park. Images come back to her of a man waiting on a bench with a ring in his hand. Director Lee Toland Krieger demonstrates a fine mastery of parallelism here, superimposing images from the past on those of the present, whether of the bench in the park or of Adaline in her cab. Subtly, we also see the change in appearance that the heroine imposes on herself with each move, going, in this case, from a brown fringe to a blond hair on the forehead. This scene, realized with great finesse and intelligently illustrating the emotions that are jostling in Adaline's heart, marks a turning point, since she will finally decide to try the adventure with Ellis...The paradoxes of non-aging

But what this film questions above all is the effect of this immortality on Adaline and the characters around her. There are of course positive sides: living for more than sixty years with the cognitive abilities of a 29 year old woman allows her to acquire a lot of knowledge. Adaline will demonstrate her mastery of Portuguese to help Ellis negotiate with investors, or will show her impressive general knowledge to put an end to Ellis' father's undivided reign on the game of Trivial Pursuit.

Yes, but... this comes at a price, and it is not necessarily easy to live this situation, on a psychological level. We've already talked about not wanting to get attached; what about when the past comes up unexpectedly? While she decides, on the advice of her daughter, to try to go further with Ellis, he decides to introduce her to his parents, on the occasion of their wedding anniversary. William (Harrison Ford), the father, immediately recognizes Adaline, whom he knew in England 40 years earlier, when he was studying medicine there. Despite the protests of Adaline-Jennifer, who will invent that Adaline was her mother, the truth will soon be revealed. And this is where the director brings the psychological question in a particularly intelligent way: what to do when you love a man, after having been in love with your father 40 years earlier? A situation difficult to accept for both of them, which will be like a storm under a skull, while Ennis does not understand anything... The role of Flemming (Ellen Burstyn), Adaline's daughter who has become an old woman full of wisdom, is also worth mentioning here. Acting as a conscience, it is she who convinces her mother to be attached to Ennis, after having forbidden herself for so long. Flemming understands better than anyone what is going on in her mother's head and the unhappiness she feels with each move. In the end, Adaline turns out to be a good film whose psychological questions on a subject already often approached are brought in an original and rather subtle way. We regret the somewhat expected end and the codes of the romantic comedy that could have been a little more shaken up. However, we appreciate to feel a certain uneasiness in front of the ethical question that Adaline faces, when she has to choose whether or not to give up Ennis, after having had a relationship with her father 40 years earlier... And this is where this film works perfectly, by making the audience feel emotions similar to those of its heroine, emotions that only she can face and answer. Rest assured, all's well that ends well!

What is aging?

Biological aging refers to all the changes that occur as we age, outside of any disease. It is an obligatory process for all long-lived species and occurs at all levels: genes, molecules, cells and tissues. Aging is characterized by a progressive decrease in physiological integrity. This deterioration is the main risk factor for several serious diseases, such as cancer, diabetes, cardiovascular and neurodegenerative problems.

What is the point of knowing the causes of aging?

A good knowledge of normal aging allows us to distinguish the effects of aging from those of diseases.

Falsely attributing certain symptoms to the effects of aging leads to a lack of awareness of health problems and to neglecting their management and treatment. The aging process is complex and multifactorial. Advances in research have made it possible to recognize the important role of genetic factors, alterations in cellular functioning or protection systems against oxidation, or the role of changes in protein metabolism. The better knowledge of the mechanisms of aging allows today to consider strategies likely to prevent certain effects of aging. Certain diseases or syndromes whose frequency increases with age have long been confused with the expression of aging. Alzheimer's disease has long been considered as an expression of cerebral aging. Heart failure was seen as a sign of cardiac aging. Atherosclerosis was seen as a sign of arterial aging. Bladder incontinence as the consequence of urinary ageing.

Today, we know that these disorders are related to pathological processes, which are certainly very frequent in the elderly, but not obligatory. In this respect, the study of centenarians who illustrate extreme aging is particularly interesting. Thus, the fact that some centenarians are free of Alzheimer's disease or heart failure indicates that these disorders are not the expression of aging. But then what are the causes of aging?

Research on biological aging has revealed genetic and biochemical causes. In 2013, *The Hallmarks of Aging*, a study published in the journal *Cell* lists nine genetic and biochemical phenomena that represent a common denominator of mammalian aging.

1. Genome and DNA damage
2. Telomere shrinkage
3. Epigenetic degradation
4. Protein misfolding
5. Mitochondrial dysfunction
6. Poor detection of nutrients
7. Cell senescence
8. Stem cell depletion
9. Intercellular signaling and inflammation

There is a division of the nomenclature into 3 families:

1. Primary aging at the DNA level
2. Alteration of systems that are supposed to protect us, but which become deleterious with aging
3. Causes reinforcing the impact of the first two families of causes

First we look at aging at the DNA level.

Cause n°1: Genome and DNA damage The DNA is a chain of information which allows the manufacture of the body. All the information contained in the DNA is grouped in our genes taken

together are called the genome. The genome contains the information that allows cells to make proteins. They each have a specific role to play in the functioning of the body. These proteins are synthesized thanks to the data contained in each gene. Our organism contains between 25000 and 30000 genes. All this information must be transmitted from one cell to another, when they divide to generate daughter cells. The DNA must be replicated in its entirety at each cell division. Damage to our DNA is perpetuated with each cell division. Over time, it accumulates and causes cells to malfunction or die. A common denominator of aging is the accumulation of genetic damage throughout life. DNA integrity and stability are threatened by exogenous factors, such as errors in DNA chain replication or spontaneous hydrolytic reactions. The impact of these lesions on DNA results in mutations, displacements, loss or gain of chromosomes, telomere shortening, etc. To restrict these lesions, organisms have built DNA repair systems that are able to resolve most of the damage inflicted on the nucleic DNA. The genome is not stable. It can undergo programmed modifications and others that occur under the influence of our metabolism, through the production of free radicals, for example. In addition, our environment and living conditions also have an impact on the genome and influence its stability.

Lesions on our DNA accumulate with age and alter the code that allows cells to reproduce, thus causing major cellular dysfunctions. Some genes make proteins that repair replication errors, but errors can affect these genes, and by a "snowball" effect, we witness an exponential growth of problems within the cell. A causal link between the accumulation of DNA damage and our aging has been demonstrated. When the cells in our body divide a large number of times and carry genetic mutations, this leads to a dysfunction of the cell, which can cause a problem in the organ concerned. As we age, repair systems become more abundant in the cells, suggesting that our body is aware of the problem and is trying to address it.

The activity of repair cells is dependent on co-enzymes, small molecules that enable them to function. Their concentration decreases with age. We often talk about NAD, which is essential to the repair mechanism and to the health of the mitochondrial DNA. When these molecules are depleted, the repair system does not work well, leading to disturbances, particularly at the level of duplication. Cause n 2: Telomere shrinkage

At the end of each of the four ends of the chromosome is a small DNA cap called a telomere, which protects the integrity of the chromosome. With each replication, the telomere deteriorates, until it disappears completely. The DNA is normally capable of replicating without error, which causes the cell to die. With each cell division, the modalities of DNA replication make a shortening of this structure inevitable. This erosion can be accelerated by stress. Beyond a certain limit, this shortening results in cell senescence. An altered chromosome mistransmits genetic information and causes fatal errors. The maintenance of telomeres of sufficient length and correct conformation associated with protective proteins is essential for the continuation of cell divisions. Stem, germ and somatic cells are able to repair telomeres and thus avoid their progressive shortening through the activity of an enzymatic complex, telomerase. There is a maximum number of division that a cell can perform (this is the limit of Hayflick), it is dependent on the length of telomeres. In the absence of telomerase, cells that are unable to repair telomeres choose to die rather than risk replicating their DNA with missing information. Cancer cells also express telomerase, making them immortal and able to replicate endlessly. The shrinkage of telomeres makes us age but also helps to protect us against certain cancers. The discovery of telomeres and their impact on aging enabled E. Blackburn to win the Nobel Prize in medicine in 2009.

Telomeres can be used to measure physiological age and some private companies propose to measure this from a sample of cells.

#### Cause n°3: Epigenetic changes

Genetics is the study of DNA, the epigenic, the mechanisms that will modify the expression of genes without modifying DNA. Epigenetics highlights the variability of gene expression as a function of time and environment. Every cell in the body contains the same genetic information, but some will give the skin, others the brain and others the kidney, depending on their environment. This discipline is at the heart of current research against aging. Scientists believe that epigenetic alterations have a role to play in triggering age-related diseases, including cancer and Alzheimer's disease.

#### Cause n°4: Bad protein folding

Each of the 30,000 genes in the genome is the design of a protein. They function by their shape. Once folded in the right way, the protein can begin to fulfill its role. If this is not done well, proteins can accumulate and cause disease, pollute cells and impair their functioning. Parkinson's disease is believed to be caused by the incorrect folding of the  $\alpha$ -synucleic protein. The misfolded proteins form aggregates in the neuronal endings and cause the symptoms we know. This problem could also explain Alzheimer's disease. This accumulation may be due to a poor structure of the protein and a deterioration of the mechanisms, due to age.

Now, we will discuss the causes that emanate from the systems supposed to protect us but that become deleterious with aging.

#### Cause n°5: mitochondrial dysfunction

Mitochondria are the 'cell power plants'. Present in each cell, they produce about 90% of the energy that cells, tissues, organs need to function. Mitochondria contain their own genes, mitochondrial DNA. The abnormalities of these genes are associated with disorders, sometimes serious, often degenerative, which mainly affect the brain and muscles. Mitochondria produce 'waste', free radicals, which act on mitochondrial DNA and proteins. With aging, the autophagy (cleaning) mechanism would no longer work as well. Mitochondria have been known to contain their own genes since 1963, but the first disease due to these genes was only identified in 1988, a form of blindness in young adults, Leber's disease. Mitochondrial DNA is only transmitted by the mother. The abnormalities of these genes are associated with sometimes serious, often degenerative disorders, which mainly affect the brain and muscles. Several external factors, such as prolonged exposure to toxins in the environment, could disrupt mitochondrial energy production in the elderly, even when mitochondria and nuclear genes were initially normal. Many toxins inhibit mitochondria. The progressive accumulation of somatic mutations in mitochondrial DNA would also disrupt energy production. There is a mitochondrial theory of aging according to which the alteration of mitochondria causes the appearance of clinical acronyms observed during normal aging: loss of memory, decrease of hearing, sight and muscle strength. In people whose energy production was already greatly reduced by hereditary mutations or via toxins, the additional abnormalities of mitochondrial DNA would lower energy production below the tolerable threshold.

Tissue analyses of elderly people with neurodegenerative diseases confirm that some of these pathologies result from the accumulation of somatic mutations. Characteristic of the syndromes caused by the abnormalities of the mitochondrial DNA: these are often hereditary diseases, long to declare themselves. The condition of the patients gradually deteriorates. The progressive accumulation of somatic mutations slowly reduces energy production, until the tissues no longer function.

#### Cause n°6: Poor nutrient detection

Our organism adapts the behavior of the cells according to the amount of nutrients available to it. Aging alters this process. Nutrient sensing pathways degrade over time. This can lead to

atherosclerosis, the leading cause of cardiovascular disease, which is the leading cause of death in people over 70. Poor nutrient sensing results from a problem in the body's adaptation to our diet. The solution could be to reduce caloric intake without depleting vitamin intake to reactivate autophagy.

cause n°7: Cell senescence.

Cellular aging plays a role in aging, cardiovascular diseases and malignant tumors. These two classes of pathologies are essentially responsible for the death of the elderly. Apoptosis or programmed cell death, or cell suicide) is the process by which cells trigger their self-destruction in response to a signal. It is a physiological cell death, genetically programmed, necessary for the survival of multicellular organisms. It is in constant balance with cell proliferation. The senescent cells send a signal to the surrounding cells which can become senescent in their turn. They accumulate in tissues, causing a loss of homogeneity and promoting rapid degradation. Senescent cells can be destroyed by the immune system, but the mechanism slows down with age. They accumulate because of the lack of renewal of stem cells and a less efficient immune system. Their accumulation weakens the surrounding tissues.

cause n°8: Stem cell depletion

Stem cells are capable of generating the basic cells of any organ. They are stored in the body and are used when needed. In some animals, like lizards, they allow the regeneration of a limb. Some organs do not contain stem cells and are not able to recover if something goes wrong. This is the case for the heart and the pancreas.

As we age, our bodies are less able to store stem cells and functional reserves. The decrease in stem cells accelerates the breakdown of tissues. Linked to the accumulation of damage in the stem cells and the shrinking of telomeres. These phenomena make stem cells scarce and lead to the development of senescent cells.

cause n°9: Intercellular signaling and inflammation

Over time, more and more cells produce inflammatory signals, which stress the surrounding cells, which in turn start to emit them and degrade our body. Cells communicate less well with each other (hormones, immune system molecules) and no longer react efficiently when needed (inflammation, detection of toxic substances).

In conclusion, this categorization helps to conceptualize the essence of aging and its mechanisms. The categories are interrelated and the effects are reinforcing. Researchers are not yet able to know if one of the factors has more impact on aging, but the 2013 nomenclature, which is the phenotype of aging is used by hundreds of laboratories around the world to find cures for aging. The Ummites, although technologically advanced by several centuries compared to this filthy Earthly human race, have not found the solution to overcome the ravages of time on the body. So this means that all human beings will end up like OEOE 95, the leader of the first expedition to Earth, dead at 95.

Soul and time. The collective spirit - The IBOZOO UU - The pluricosmos. Date: 12/03/1973 To: Mr. Juan Dominguez Original language: Spanish Notes: Second of 2 letters (D105-1 and D105-2) sent from London - 3 pages

Translator's note: Spanish, "ser" (plural: "seres") translates to "being". It is difficult in French to speak of "inanimate beings" for stones for example. So I chose a translation by "entities" but I indicate in Ndt that it is "ser(es)" in the Spanish text if there may be a doubt (note that appears in popup when you hover over it). I kept the translation by "beings" when it was about "living beings". Keep this copy Mr JUAN DOMINGUEZ M.

You know well that for an Oemii whose formation process involves a high degree of neurocortical complexity, time appears as the conscious sensation of a flow of events whose arrow is defined

by the comparison of two events of any kind, taken as a reference. Our mental mechanisms, by opposing these states, consciously assess - unconsciously the fact that one of them is always more complex in accumulated information than the other. In this way we fix the arrow of time: We will express this in another way for your less prepared brethren: How will we know today that time passes by moving from the past to the future? We will have two episodes: the one in the morning when we read in the press about a catastrophic train accident, and the one in the afternoon when a radio station enriched our information, giving us the names of the dead during the derailment.

Observe that the whole measure of TIME has been limited to finding different levels of information. At a given moment, the observed watch or pulse controlled assumes the counting of a given number of revolutions of a gear or recording the number of cardioid pumping pulses for the blood plasma. What you call "a moment later" is to observe an increase in information, represented by a new number of motor revolutions or by nerve impulses activating the muscle fibers of the heart. Put another way: the wealth or the informative increment is TIME, not THE FUNCTION OF TIME AS SOME THEORISTS OF THE EARTH THINK.

Any physics that purports to measure a magnitude that in turn is A FUNCTION OF TIME, is actually measuring A FUNCTION OF INFORMATION. A timekeeper who claims to have evaluated the speed at which a JET moves in space, in reality did not measure more than a distance and simultaneously, he himself became more complex, He enriched the information contained in the databases of the memory register with his neurocortical memory, and therefore (as we will explain later) he enriched the mass of information contained in the BUUAUEE BIAEII (Esprit du Réseau Social).

Says another way: the time interval, represented by a chain of IBOZOO UU, inaccessible by the instruments of the scientific OEMII, undergoes a rotation of its axes and comes to convert into an increase of information that enriches the biological system "neguentropic" (network of living beings) It does not matter that the timekeeper dies and with him disappears the molecular-coded record of this information contained in his neurobrain. BUUAUEE BIAEII maintains indelible information content.

(We will use a crude example: it will not matter if a symphony of Beethoven, recorded on a mylar tape with a magnetic emulsion, is destroyed, if the symphony is engraved in the minds of millions of listeners.) But the example, we repeat, is rude: But if the recording had not been listened to (by anyone), if not by the microphone of an EARTH tape recorder, the information would be destroyed when the band would burn.

It does not happen that way when a single OEMII receives, even at a subliminal level, a stimulus coded sequence (INFORMATION), then the information is inscribed at three levels (IMAGE A) These levels are:

LEVEL (BIAEYEE IUEOO DOO): it corresponds to the physical (molecular) bases of our OEMII (somatic factor: physiological body). Information received by neural sensory transducers accesses the cortex through nerve impulses transmitted by nerve fibers. This mnesic coding is carried out in binary base through alterations of the molecular structure of cells that constitute the BIAEYEE IUEOO DOO.

SECOND LEVEL. the information codified in the IBOZOO UU that form the neuronal mass can disappear by the degradation of the physiological structure that underlies it (physical death of the OEMII)but at the same time a complex process of triplication occurs in the storage of information: The information captured by our sensory channels is not only recorded in our physical memories. A network of DIUIAA (Krypton Gas) receives from BIAMOASII (a biological structure not yet detected by the anatomists and physiologists of the earth) this information of a very particular form.

Nerve impulses cause the decomposition of an enzyme. This reaction is exothermic in character. In turn, the thermal function generated by this process induces a very high-frequency gravitational alteration, which results in the excitation of these krypton atoms through other HELIUM atoms. The result is a resonance effect between a network of helium atoms and the network of krypton cited, and the resulting alteration of the quantum states of the two IBOZOO UU networks (we think of atoms as networks of IBOZOO UU. The BUUAUAA (individual mind) thus fixes this INFORMATION, but "uncoded" in a mathematical system (digital coding BINARY)?

The BUUAUAA is adimention 1. However it has a component that you would describe as MATERIAL. We are entering, Mr Dominguez, a very difficult educational process. From now on your familiar semantic bases are not enough to explain it in an intelligible way. Aristotelian logic will absolutely not help you to follow our reasoning.

Let's see: in this writing I am making sure that BUUAUAA has a component, or else is affected (to express us more realistically), by a physical component. Even before we speak of him, it seems to apply a logico - binary conclusion, in contradiction with the scholastic conception of the animist thinkers of EARTH.

According to our "affirmation" it infers that the SPIRIT has "parts" and therefore, it is divisible: fractionable.

But this is not the absolute case. BUUAUAA is an IMMATERIAL entity even if its internal processes are, or possess, a physical character.

We have told you in other documents the existence of what we call PLURIUNIVERSE (UAAM-UAAM). An infinity of cosmos coexist for a hypothetical observer who could observe the IBOZOO UU NETWORK that constitutes the AIOYAA (in our logic: Entities that exist with dimensions) from various perspectives. Just as a sculpture can be photographed from different angles by producing distinct images on the photographic plate (forgive us, men of the EARTH, the simplicity of the example), so an ideal observer could contemplate the UAMM-UAAMM.

In practice such ideal observer exists. It is possible, using technical means, to pass from one UAMM to another UAMM. And in fact we do it ourselves in our travels.

What physical means will allow us to become aware that we meet-Is this another three-dimensional framework?

One is enough:

In the absence of mass disturbance, appreciate an interval of time: (the fact that we conceive the awareness of time as an increase of INFORMATION will make our assertion even better understood). This time interval is the time that elapses when an IBOAYAA OOU (what you call "energy quanton") moves over a standard distance. This interval will be different in each UUAMM (COSMOS). After this digression, we continue our description of BUUAUA: we know that there is a UUAMM (inaccessible by technical means) in which a hypothetical OEMII that could move within it (hypothesis completely absurd) measure this time interval as NULL. Observe that we define the interval of TIME (NON PHYSICAL) as a discrete quantity defined by two IBOZOO UU; So that there is no metaphysical sense to refer to a time interval of zero, as it would be absurd to refer to a zero distance. Since in either case the Minimum time and space intervals are defined quantities, when evaluated with a standard, as non-zero.

And yet (insurmountable contradiction with binary logical bases) there is a UWAAMM in which the speed of light, in the absence of mass disturbance, will be infinite. In this cosmos all this network of IBOZOO UU has been reduced to a single IBOZOO UU, another apparent absurdity if we transpose it to our three-dimensional framework, in which a single isolated IBOZOO UU has no physical significance.

And yet this UAAMM, analysed in a simplistic way, would seem a disconcerting simplicity. What can a single IBOZOO UU represent? It possesses an important transcendental for us the OEMII of different galactic origins.

Before we go on, perhaps you could ask Senor Dominguez one of the questions. What about the IBOZOO UU network that would make up the UAAMM-UAAMM? For the utopian visitor of this cosmos: has such a structure disintegrated? No: simply this IBOZOO UU is the image of the whole NETWORK (visible in the rest of the COSMOS). Again using a childish didactic metaphor, it is as if the observer of the statue visits the museum one night to photograph it and finds it only illuminated by a light spot. On the photographic plate would be recorded only a brilliant point.

As we mentioned a few paragraphs earlier, such a UUAAM is transcendent for us humans. Indeed: our telepathic processes: the information contained in the BUUAUAA (SOUL) and the BIAEYEE IUEOO DOO (Spirit of the SOCIAL NETWORK) would not be possible without its existence. It was to him that we referred, when we previously spoke to you of the physical "component" of the soul. The BUUAUAA itself cannot encode the information. It is adimensional. "IT DOES NOT EXIST IN SPACE OR TIME". The theologians of the Earth have erred an error when they have considered that the SOUL, according to the animist conception that inspires them, can "know" what the body realizes. It leads to the contradiction that the soul would be able to accumulate INFORMATION and at the same time to BE INDIVISIBLE.

In the UUAMMM we mention, you can consider that the SPEED OF LIGHT, measured within it, is INFINITE. Although precisely in this cosmos the concept of SPEED OF LIGHT lacks meaning, as it would also be wrong to define in it a quanton of length or a measure of energy. However, it has characteristics that precisely define it: He is able to accumulate INFORMATION. The flow of information takes place in a NULL time. The increase in INFORMATION has no significance ( $\Delta t$ ).

This letter previous titled "the soul and time.The collective spirit-The IBOZOO UU-The pluricosmos" sent in 1973 to Juan Dominguez where the Ummites explains that time is a discrete quantity defined by two IBOZOO UUs and a time interval is a chain of IBOZOO UUs; The flow of time is the rotation of these axes, and therefore the angular speed called pulsation  $\omega$ , it is the speed with which time flows, so writing  $\cos(\omega t)$  no longer has meaning, because time is the angle itself. It is precisely this axis rotation that enriches the biological system which leads to the aforementioned alterations, the 9 causes of the aging of the OEMMI. For an atom, or subatomic particle, the axis rotation causes the atom to age, but this has no influence on its lifespan. At the biological level, however, this leads to a series of dysfunctions that lead to aging. Although living beings age because they have an internal angle that rotates (the speed of rotation is contained in the angle), these angular variations end up making mistakes to the biological cells in their duplication.

The soul and time.The collective mind - The IBOZOO UU - The pluricosmos. Date: 07/12/1972

To: Mr. Juan Dominguez Original language: Spanish Notes : First of 2 letters (D105-1 and D105-2) sent from London - 3 pages.

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Senor JUAN DOMINGUEZ MONTES MADRID SPAIN THE BUAUAA

The concept of BUAUAAA can only be considered by means of certain hypotheses that require different semantic instruments, a logical basis different from the topicality and thought of the different philosophical schools of the EARTH. In a first linguistic interpretation the phoneme BUAUAAA, and the entity or ontological factor that it tries to represent or encode could be translated in the language of the EARTH as : SOUL, MIND, PSYCHE, or VITAL MOTOR. In reality the concept that on UMMO we label with this term has much more complex characteristics. It would not be easy to identify our idea of BUAUAAA with the ideal image that theodic thinkers of your humanity, Christian theologians and scholastic psychologists have formed of the MIND.

Undoubtedly, many of the characteristics assigned by us to the BUAUAAA are identified with the qualities which some of your thinkers ascribe to the soul. As a general rule we know that the "soul" we call BUAUAAA is dimensionless and therefore the factor or dimension of TIME is meaningless to it. It is also indestructible and has the particularity of being GENERATED by WOA (GENERATOR OR GOD).

There will surely appear a conflict with the EARTH ontologists when we say that it cannot be ETERNAL because this concept automatically implies the temporal dimension. And the confusion for you will become even more apparent if we assert, using our logic which considers as NON-EXISTENT that whose ontic chain does not include IBOZOO UU (essence of the real, of the dimensional and therefore ascertainable by physical means), and if we assert - we repeat - that the BUAUAAA DOES NOT EXIST. For the animists of the EARTH, the SOUL is created at the moment of conception of a new human being, the soul will conform, with its free will, all the conduct of the man until his death. After this death the soul continues to exist and is "remodeled" by the creator, who sanctions it according to this line of conduct freely chosen by it.... (Excuse us for summarizing so narrowly a psychotheological doctrine that we know to be much more complex: but we are not trying to make any criticism of it and on the other hand we assume you are informed of your own philosophical conceptions on this subject).

Instead, we will try to outline our own conceptions. In the first place we distinguish between two classes of BEINGS existing in the UAANM (COSMOS) in opposition to two other great kinds of "NON-EXISTING ENTITIES" These last ones are : AIOYAA AMMEIEE UAA such as WOAA - THE GENERATOR - BUAUAAA (HUMAN MIND) BUAWEE BEIAEII - COLLECTIVE MIND - or BUAUAAAA BAAIOO (MIND OF THE LIVING BEING) and AIOYAA AMMEIEE OUEE (Such as: the content of a piece of information, the sensation of pleasure, or a popular tradition). The "EXISTING" ENTITIES whose essence is defined by IBOZOO UU, such as a rock, a virus, a star, or the flow of time and which, therefore, allow an empirical way of analysis, then we define them as.

Existing: For us, the distance between two points or an interval of time has the same ontological nature as a crystal of antimony sulfide or a neuron. On the other hand, we do not see how the stated concepts could differ from each other, except in their complexity as a chain of IBOZOO UU, and in the content of the information that such structures possess. Undoubtedly the distance between two solid stars is materialized by a NETWORK of IBOZOO UU, we do not conceive the straight line as a purely mathematical abstraction without its sub-base of IBOZOO UU, because such an entelechy is not contained in a gnoseology of UMMO.

But it is that also an interval between two "instants" (we use here the concept of instant to facilitate our presentation but it does not have a reality with us) has a structure of IBOZOO UU. Moreover, we can assure you that the distance already quoted between stars would be interpreted, by beings of another dimensional framework, as a simple flow of IUW (unit of time) measured by its chronoscopy

A distance and an interval of time constitute examples of CHAINS with a minimum state of possible information.

Conversely: with an equal number of IBOZOO UU involved, a volume of antimony sulfide has a complex structure that will involve a greater degree of information. Already you must be aware now that the distinction that the mathematicians of the Earth formulate between CONTINUOUS AND CONCRETE OR DISCRETE SIZE is false since it does not make sense to assign to distance, speed, time... a character of continuous size. The "quanta" of speed, acceleration, length, etcetera, have their own personality in the universe of AIOYAA (EXISTING) beings.

The degree of informational complexity defines these beings. As your own biologist brothers of the EARTH have very well sensed, the VIRUSES (also known on Ummo) are AIOYAA, whose degree of complexity (this one being defined by the quantity of INFORMATION contained per unit of volume and mass) means a threshold between the living and non-living beings. We prefer to call the first ones ENTROPICONEGATIVE OR NEGUENTROPIC and the second ones ENTROPICO POSITIVE (AAIODII EXUEE and AAIODII YOOWAAA respectively) because for us a LIVING BEING is a SOCIOIBOZOO NETWORK able to enrich its content of INFORMATION "relatively to its mass", structuring itself in the course of time towards more complexity. And why is this so? Simply because the IBOZOO UU that form the chain of TIME are positively incorporated into its previous structure, changing their axes and permuting themselves in discrete quantities of volume and mass.

For living beings the flow of TIME means nothing else than a "conversion" of a NETWORK of IBOZOO UU potentially linked to them, as a TIME GREATNESS into other GREATNESSES (such as GRAVITATIONAL FIELD, MAGNETIC FIELD, ELECTROSTATIC FIELD, LENGTH and MASS). Using a crude but didactic comparison, you could translate this into the fact that LIVING BEINGS "feed" on the elapsed TIME, "digesting" it and transforming, through a curious metabolic mechanism, the TIME into MASS and other "by-products". We observe here a process of ADDITION. On the contrary, AAIODII iwaa entities (inert "seres" entities as you would say) such as argon molecules, an aerolite, or a microwave beam, are characterized in that they degrade their own complexity. What EARTH physicists have already observed when they define the laws of thermodynamics and formulate concepts such as THERMAL ENTROPY and DEGRADATION of the UNIVERSE have a slightly different meaning for us. The non-living entities are characterized because their own NETWORK of IBOZOO UU undergoes a slow process of "rotation" in its "AXES". The chains of IBOZOO UU that previously possessed mass characteristics first degrade in energy with increasing wavelength and finally in TIME. According to this concept, the end of the UAAMM (COSMOS) would not be, as some human cosmologists assume, "a terrible ocean of thermal radiation", but rather a disconcerting universe in which only TIME, as a dimension, would have its home, without any living or inert entity, being able to undergo its flow, "its arrow". But this is not precisely the end that awaits our WAAAM, as we will explain to you on another occasion. Before continuing: allow us, Señor Juan, to propose a pedagogical model that makes the concepts stated so far more understandable. Naturally this example should not be taken too much as the image of reality, although it may contribute to the assimilation of such ideas by your brothers.

Imagine an immense plain, or perhaps a gigantic table, on which have been spread with uniformity and symmetry millions of playing cards placed upside down. For one purpose only, the player has dealt a long line of identical cards. Perhaps it was the AS of TREFLE which of them was placed on the back. An observer flying a few decimeters away in an imaginary helicopter over the huge playing table would observe only a large area covered by the same color of the back of the cards and as a dominant color note the AS of TREFLE, positively reversed. The cards represent the

IBOZOO UU. The hidden player can, under the table, make the driver of the vehicle believe that the card "advances", "runs", on the table. With a wand and through the holes in the table, turning over all the AS DE TREFLE cards on the table in a row, taking care to turn over the previously turned over cards. If the player is skilful and does it with a dizzying speed, the observer will have the optical illusion that our reference card, skates, slides, when in reality not one of the colored cards has moved from its original position.

But the player can take his joke even further. Each time he picks up an AS DE TREFLE, he also turns over an adjacent card, two in the second operation, three in the next... so that the observing pilot contemplates that the AS DE TREFLE not only "slides" but also that in its surroundings appears in a magical way, a whole polychromy of cards.

Perhaps the example would have been more telling by substituting, to the cards, polyhedrons with multiple faces that would represent better IBOZOO UU, but this model would have lost of its simplicity of explanation. Why beings: VIRUSES, PROTOZOARS, VEGETABLES, MEN ... enrich their informative complexity at the expense of the same TIME, and on the contrary inanimate entities like a steel bar, a cloud of ammonia vapour, or a galaxy, reduce (albeit with an extremely slow pace) their informative content? The explanation is none other than the BUAUAA, as we will inform you in another letter, Mr. Juan Dominguez Montes.

In this other letter next to the previous one on the conception of time, the sentence of the Ummites «you could translate this by the fact that LIVING BEINGS "feed" from the elapsed TIME, the "digesting" and transforming, through a curious metabolic mechanism, mass TIME and other 'by-products'. Here we see a process of ADDITION » so time is transformed into mass, so the rotation of the IBOZOO UU pair generates time and time is lowered by the biological structures that transform it into mass, and they add that there is a process of addition, so mass is a sum of angle, and one of those angles is time. This angle, by turning, has been transformed by the biological system, that is to say the organization of the atoms that constitute the biological tissues absorbs this angle and transforms it into geometric deformation or mass.

These notions are valid for all living beings, but UMMO is a historical society like the Earth, 'that is to say which is able to describe and date the significant events of its civilization on a chronological phrase as presented in the following letter.

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 Title of the letter: History of Oummo. The soul and the Ibozoo uu. Date: 04/10/1987 To: Mr. Jorge Barrenechea Original language: Spanish Notes: A letter from? page. UMMOAELEUUE  
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Mr de OYAAGAA Jorge Barrenechea (especially for your wife Carmen Maria)

Jorge: We are a people older than OYAGAA (Cold Star of the Earth). The appearance of the OEMII on the old volcanic lands of Ummo dates back to some  $9.3 \cdot 10^6$  earth years, which makes our OYAA about  $43.9 \cdot 10^6$  years of Ummo.

It is very difficult to determine among the different "humanoids as you would say" that have succeeded each other in these distant times, which branch has been converted by a very special mutation, in OEMMII or rational man with all its attributes that center in the integration of the OEMBUAUFW (Krypton Network).

When the human "is born", that is to say: not at the moment of the Parturition, but when both female and male gametes base their genetic charge develops in a distant Universe a gigantic cell

of IBOZSOO UHUU (actually a complex network of these particles, formed by large chains of angular relations). These large chains in turn form an extensive substrate or matrix in which all the information of our life will engross in an area of the network while the rest codifies a whole program of instructions that conform to each tetradimensional OEMII. Notice that this four-dimensional human, including Time – is conformed as a non-continuous (discrete) entity (meanwhile, time is constituted by quantum or discrete units). The BUUAUUA as this cosmic cell is called models all man's conduct freely and all at once, although we experience the illusion that time flows slowly. But it is necessary to better understand the process, to accept our slow perception of time and to analyze along its axis what happens in relation to the organism and its BUUAUUA.

In principle, we know that any living organism, an alga, a bacterium or a giraffe of the Earth, when it is generated, has a BUUAUUA (individual soul) (B.) in this "distant cosmos".

This soul is sterile. Its network of IBOZSOO UHUU is not able to codify any information because there is no link that attaches it to the organism that was born on a cold star.

Only the OEMMII (human) synthesizes at the moment of chromosomal fusion, a set of Krypton atoms which, by an effect we call (translated:) Membrane Effect or Border Effect, allows communication between two so distinct Cosmos.

This is what happened with the first hominid that turned on Ummo by converting into "really OEMMII". We do not know exactly when this happened, nor who was the first privileged person to live at the time indicated at the beginning of this letter. We have obviously been able to reconstruct, with more precision than the Earth Paleontology, the habits and roles of these first inhabitants of our OYAA (Star).

We know that about the 11.8 million-year-old Ummo traveled, our ancestors wrote with a quasi-ideographic alphabet and counted using the decimal system as you do now (For now our system of numeration is based on 12). Even in year one of the first era they still counted in decimal system. In the year One it was believed that humanity would live only for six thousand years-Ummo (one thousand two hundred and seventy years of Earth approximately).

This is where we find the origin of the current era of six thousand years-Ummo. Because you are asking for a comparative calculation, we will say that the year One corresponds to what we call the Monocratic Government (started at zero of the first era). The second era, called UMMOWOA (Divine Man), began in the six thousand years.

UmmoWOA was born in the year Ummo 1282.03 of this second era.

If we could synchronize time with you without disturbing the spatio-temporal relations we would say that for my UMMO brothers we are today in the year of Ummo 5923 of the third era and therefore practically on the point of initiating the fourth. In this idealized scheme (it is because such perfect temporal synchronization is not possible) The divine figure of Jesus of Galilee born on OYAAGAA (Planet Earth) would have arisen around the year Ummo 2541 of the second era.

Important dates in our timeline are (expressed in U years).

First traces of medical therapy appear 390 first Era.

We discover the real rotation of Ummo 3326 1st Ere.

IUI 12 son of IUI 11 dies: 4331 1st Wing.

The first gigantic toroids were built to obtain electrical energy from the Ummo 5607 1st Age magnetic field.

We obtain the first real images on a sensitized surface in the year 402 2nd Ere.

The first AACXBOUZZ 752 2nd Wing Methane Gas (Rotatory) Force Generators are invented.

Birth of the cruel child IE 456 in the year 1230 2nd Century.

UMMOWOA was born in 1283 B.C. UMMOWOA disintegrates in 1405 2nd Century.

Birth of iMMII 28 sons of IMMII 22 and with him the modern BIEEUIGUU (neurobiological psychology) 4100 2nd Era. We build the first plasma engines 5476 2nd E.

Separation on UMMO of the New Company IGIAAIUYIXAA 5902 2nd E.

From the year 6000 follows an era whose calculation is not taken into account on UMMM0. It lasted 11,750 Ummo years and is called AGFUIUU DUUA. It's the «Night of Ummo».

Then began the zero moment of the third era (Our Time).

In the year 75 came the naves of the Cold Star DOOCAIAA.

Krypton atoms from OEMBUAUF 315 3rd Wing discovered. The principles of Cosmological Biogenetics are based on 2906 3rd Century.

The distant beginnings of Ummo Humanity have left their mark on many archaeological remains. Our stratigraphic analysis methods, which allow us to analyze any topographical area without any destruction, by exploring the ground layer by layer at laminar thicknesses of less than 0.2 microns using fine particle beams (note 1) neutral and a receptor that penetrates deep into the ground by melting the rock with ionized gas at very high temperatures and transmuting the residues into hydrogen gas, allowed us to study virtually the entire large continent of OYAAUMMO, the emission is neutral but undergoes a transformation in its components IBOZSOO UHUU then transforming into quantum photons of high energy.

Thanks to this system, even small fossilized bone remains and diminished remains of old scrap can be detected. Their shape is codified in three-dimensional models and stored in biological memories. It is not necessary to extract these remains from their framework in contrast to what paleontologists and archaeologists of OYAAGAA (EARTH) do. We assume that your descendants will be horrified when they analyze historically the great plunder of the Earth that your analysts have realized, extracting these remains from their topological framework. (We are not criticizing the method, because in the current course of Earth technology, the study of past civilizations would not have been possible without exhuming these remains, restoring them and depositing them in museums). We also have museums where the remains accumulate, which in a way similar to that developed by your current archaeologists of the Earth, were isolated by our previous techniques. We can even determine the color of an object buried at great depth. The neutrino beam is of such resolution that it not only analyzes the density but also the chemical or molecular composition, not only of the surface of the artifact or the rest of the anatomy, but also of its internal mass. Later a decodifier system allows to discriminate the rocky or clay environment that surrounds the object. Our SANMOO AAYUBA (computer network) sends to the UULODASAABI (three-dimensional visualization terminal) an image that can be amplified or reduced at will, of the topological environment where these remains are located, which are visualized as if they were floating in space (Space: we repeat; that corresponds to the middle of NIAA (rock) muddy, sandy, etc., where these objects are located. A study by processing all the information received, allows to reconstruct the historical course of our ancestors, starting from their own fossilized remains and the artifacts they built (buildings, tunnels, scrap metal, containers, weapons, writings, etc.) Thus we have been able to isolate very curious documents that show; how interlaced fibers in various ways constituted the primitive forms of codification of information (writing). In another posterior form of writing we saw coarse balls of dried mud on which were nailed small thorns or small stems of shrubs. A third form, more advanced, incorporated thin slats of hammered copper, which our ancestors pressed either on a surface of semi-fluid clay or on a layer of freshly cut leaves. With wooden punches they traced their ideographic signs.

We can also observe in some places of our Continent, large monoliths of volcanic rock, forming slender steles on which the doctors of the time traced their therapeutic writings. They were real

public encyclopedias where anyone could consult the remedy to his evil.

The tendency of our ancestors was to build underground houses. Our soil is volcanic, very friable in the rocky parts and it did not take much effort to build large galleries in the lands where the natural caves were not abundant. They were, like us, great lovers of Nature and considered it an authentic desecration to alter the physiognomy of the landscape with constructions on Earth although we have also located some in some regions.

The diet focused on the use of the flesh of OAGISUHUA Animals that recall the reptiles of the Earth and the eggs of UYAAIAAAA, whose structure would remind you of the terrestrial arthropods and especially, as a basic food, the fleshy pulp of the AIMOOAA.

They formed very bellicose groups although we did not find any serious traces that they practiced cannibalism, but on the other hand, some tribes cruelly pursued their enemies. In this they had nothing to envy to the abuses and cruelties of some of your distant ancestors.

The earliest vestiges of electrical technology date back to 5300 CE when large copper conductors were laid on the ground and plates of the same metal were buried to use the electrical potentials you call telluric. They were also obtained in silver which on OYAAGAA is almost as abundant as the first quoted metal.

But the historical past on UMMO, although an older civilization, has been less turbulent than on Earth. Racial groups were less numerous, phonic expressions less rich in singularities and the diversification of cultures much less multifaceted than the one that developed in you. There were really terrible times; During a dark night, the omnipotent power of a very young girl. - Only a teenager, -threw into the despair and suffering of the enormous multitudes of human beings. A very large part of the female population suffered torture from being forced to suffer successive copulations and forced by planned rapes. The men were condemned by this cruel teenager to ingest their own feces and to experience torture based on refined technological principles. This sick person generated a high quota of pain in society but yet during his term of office Nature's studies developed and Technology experienced a remarkable advance.

In the end we all UMMO OEMMII generated the same language and developed our OANEEAOII YOIO (telepathic) communication capability.

Understanding our language is difficult for you because normally we overlay within the same series of phonemes, two simultaneous flows of expression. The modulation of these sounds and the repetition of phonemes is not redundant but it constitutes a course of ideas distinct from that expressed by the pronunciation of words and their ordinance. It is as if to emit the thought "We were in the country" you were enjoying another sentence with a different semantic content "KILL ME THIS SNAKE" You could achieve this by codifying the repetition of syllables and changing the tone of voices in the distinct phonemes "TUeez eez moi Ce Ce ser SER pen T t" We simultaneously express these two ideas through the bilaterality of the two cerebral hemispheres that you call Phonation or Broca latero-frontal area, and which in the OEMMII of the Earth is located only in the left hemisphere while in us it is in two symmetrical zones. The course of our thought also doubles which allows us to have a single conversation (this time in the simple sense of discourse) and to simultaneously meditate around a subject that has nothing to do with dialogue. It is then as if two ego coexisted in the same brain, but capable of exchanging information.

I don't want to take advantage of your kind patience in reading something that has nothing to do with the man of the earth. I am a woman of Ummo (We pronounce IIEE to express our gender, and I am the director of the small commission of twelve OEMMII my brothers, who are currently in Europe. Which: Four beings including me, sleep in Spain, your beautiful country. My name is INDOO 33 daughter of INDOO 29.

You have recently had the opportunity to receive reports from my brothers, submitted to me, who express to you their own greetings.

The Ummites have 4 million years of evolution more than this dirty race the Earth, so it is an important advance in terms of evolution. Many anthropologists wondered how it is possible that a neighboring extraterrestrial human species (located less than 20 light years away) is at the same level of technology and about the same level of evolution (9 million years, or twice as long as SAPIENS), because on the scale of the age of the Earth and the Sun, it is finally not much. By observing the face of ADAA 66, we can distinguish a very large font, which supposes a larger brain and mediums' eyes, these people have a magnetism very superior to the average and are able to heal the sick by tactile contact and are capable of telepathy. We can therefore say that during these 4 million years, We can say that during these 4 million years, the human species of UMMO has evolved in term of capacity of the brain, and of capacities of telepathy, of communication at a distance, that's why the capacity to speak with the vocal cords, besides the Ummites, that they tried to correct this defect to stop speaking during the adolescence but that the operation failed. So the technology and the operative techniques cannot go against the natural evolution of the species, it is that the great teaching of this information. But it took several million years to reach this degree of evolution to acquire the ability to speak through thoughts and for the brain to be able to hear sentences sent by telepathy. Obviously the species of the Earth is still very far from it. It is easier to catch up with a technological delay of several centuries, than to catch up with millions of years of evolution. The Ummites also have the ability to see images from the touch of their hands, they place their hands with fingers tightly together, the contact sends an image to the brain which is perceived by the retina, this image is of lesser quality than that perceived by the retina directly. That's why they didn't like typing because it makes them lose this wonderful evolutionary ability. The genetic mutations thus led to marvels of the evolution, which must make shame with the representatives who are only vulgar primates beside the Ummites. Time has thus had an admirable influence on the Ummites who communicate without speaking, they are on the way to the ultimate spiritual elevation, they are jewels of evolution. They must treat the Earth race with the greatest contempt. Not only is the star too hot, but the evolutionary delay is abysmal. This explains why they communicated by mail, because they can't talk face to face or on the phone. The evolution leads to not talking anymore, we talk by thought. As Albert EINSTEIN said: « Let A be a success in life. Then  $A = x + y + z$ , where  $x = \text{work}$ ,  $y = \text{fun}$ ,  $z = \text{silence}$  ». So, we are very far from this stage of evolution, and that is why although the physical resemblances between the Ummites and the Earthlings are sufficient to penetrate the terrestrial network by posing as Scandinavians (Danish passports, Swedish , Norwegians), they are always reluctant to make an official announcement of their presence on Earth. They were also cooled (no pun intended) by the attitude of the scientists who tore up their letters with contempt, which is why they addressed themselves to enthusiasts of ufology and esotericism: the head of the Ummites had also said about Sesma: « He loves the universe, that's enough ». What will the man look like in 1000 years? In the year 3000, the evolution of the human species will give birth to larger individuals, with large eyes but with smaller brains, according to science fiction forecasts of the daily The Sun. "By reasoning absurdly, one may wonder what it would take for a human population to remain stable," says Alexandre Courtiol, a researcher in evolutionary biology at the Leibniz Institute for Zoo and Wildlife Research in Berlin. " The conditions necessary to avoid any form of evolution are indeed very restrictive: «That we all have the same number of children, that we all live to the same age, that we choose our partner at random, that there are no mutations, that there are no migrations», lists the biologist.

Indeed, as Darwin understood so well, living beings evolve mainly because the individuals best adapted to their environment live longer and reproduce more. This famous natural selection thus helps to propagate the most advantageous traits.

If we understand that a more powerful wolf dominates its pack and transmits its genes for example, we can however wonder what separates two potential partners mated to a pair. In a cosmopolitan metropolis like Montreal, a multitude of visible or invisible traits are represented in the population. Success in love, and possibly the number of descendants, depends mainly on socio-economic conditions, the vagaries of life as well as free will, but the DNA of each one also contributes in a small proportion.

Evolution happens whether we like it or not, as long as there are variations in reproduction that are related to certain traits, explains Elisabeth Bolund, a specialist in evolutionary biology at the University of Uppsala in Sweden. We often hear that natural selection has been stopped because most babies (and not only the best adapted) survive to adulthood. Yet the number of children per person varies enormously. And in modern societies, like here in Sweden, only two-thirds of adults reproduce." So there are multiple levers on which evolution can play. In a study published a few years ago, there was a strong selection favouring high statures among men in the Netherlands," the researcher said. According to the article in question, the Dutch older than average had about 10% more children than their smaller compatriots. Obviously, the criteria under which partners are chosen are very different from one society to another. What pleases the Netherlands may lack charm in China.

But, everywhere on the planet, great mechanisms at the basis of evolution always act on the human, including natural selection, which crystallizes in the choice of the partner and the number of children of each; genetic mutations that occur at a sustained rate, perhaps even accelerated; and all-out migrations, which homogenize the global gene pool.

Yet, the evolution of modern humans attracts very little attention, says Scott Solomon, a biologist at Rice University in Texas and author of the 2016 essay *Future Humans: Inside the Science of Our Continuing Evolution*. "When I did research for my book, I was surprised to find that we knew much more about the evolution of some bird species than we did about ours!"

After spending a lot of time watching turtles, lizards and birds on the Galapagos Islands, biologists may want to take a look at the bass fauna while sipping a beer.

There are four forces behind our current evolution.

#### 1. Mutations

Genetic mutation is the basic ingredient in the evolution of a species. Without mutation, the DNA would be stable, unable to incorporate new variations. However, there is no reason for the rate of mutations to slow down in humans today. In fact, we can imagine that it is accelerating, with all the pollutants we are now exposed to," notes biologist Alexandre Courtiol. Experiments with mice have indeed shown that air pollution increases the number of mutations.

Although genetic mutations occur every time a cell divides, it is those that affect sperm and ova that feed evolution. These mutations replicate during the growth of the embryo and are found in all the cells of his body. It is estimated that the DNA of a newborn has on average about 60 mutations compared to the genomes of its parents. While these mutations can sometimes be responsible for rare genetic diseases, they are for the most part harmless. And may also, on occasion, confer a useful or attractive trait...

The rate of mutations is not decreasing, says biologist Scott Solomon. Especially since the number of mutations is strongly correlated with the age of the father at the time of conception." In a study published in the journal *Nature* in 2017, Icelandic researchers noted that, for every eight months



of age, fathers on average transmit one more mutation to their child. The same study found that 30-year-old fathers bequeath an average of 45 mutations, while mothers of the same age give only 11. Because the testes produce sperm throughout life, genetic mutations add up over the years. There are four forces behind our current evolution.

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### 2. Power Supply

“Tell me what you eat and I’ll tell you who you are.” While diet is one of the most important determinants of a person’s health, it is also one of the main forces shaping the evolution of our species.

Indeed, natural selection favours individuals who are most suited to the food available in their environment. For the first farmers to domesticate cows for their milk, probably in Anatolia more than 7,000 years ago, this meant having the genetic mutation to digest lactose. For a human today, the challenge is to stay healthy while eating fatty, sweet and salty foods and eating portions that have never been larger in the history of humanity. “Our regimes have changed a lot in the last 100 years,” says Scott Solomon. There is a strong correlation between diet and some causes of mortality, such as cardiovascular disease, diabetes and obesity.”

Moreover, a major American study shows that the last generations have adapted to a menu rich in cholesterol in order, it seems, to protect themselves from the deleterious effects of this fat taken in too large quantities. In 2010, a team led by American biologist Stephen C. Stearns analyzed data from the Framingham Heart Study, which assesses the health of thousands of subjects over three generations, hoping to detect the mark of evolution. The researchers found that women who were genetically predisposed to maintain low cholesterol in their blood had more children, for reasons that scientists do not understand. As a result, these alleles (genetic variants) tend to become more common in the population. For the next generation of this cohort, the authors predict a reduction in cholesterol levels due to natural selection of 0.8 mg per 100 ml of blood (normal levels range from 150 to 300 mg per 100 ml of blood). However, the average real rate will depend to a greater extent on our collective system. “This study shows a relationship between blood cholesterol levels

and reproductive success,” says Emmanuel Milot, a genetic biologist at the Université du Québec à Trois-Rivières. “However, it is not clear whether this is due to decreased survival, decreased fertility or anything else.”

How the food culture in this case is constantly interacting with nature. Culture is part of the environment. Collectively, we often change the traits that are selected and cross-selected, stresses researcher Alexandre Courtiol. And it can go very quickly, because you control the culture.”

### 3. Migration

In Canada, one in five people was born abroad. On a global scale, there have never been so many population movements: around 250 million people now live outside their country of origin. For genomes scattered all over the earth, this is an unprecedented mix.

This will create more homogeneity in the distribution of alleles on the planet, notes Courtiol. As a result, migration will reduce the local adaptation of certain groups to their environment, such as people living in high altitudes.” Thus, the former Andean populations had genetic «attributes» endowing them with heart muscles particularly adapted to the low concentration of oxygen in the air. A 2018 study traces this evolutionary adaptation to six or seven millennia before today. However, this type of “specialization” is eroding as populations are intertwined.

However, thanks to migration, “we can expect beneficial mutations to spread faster as well,” says researcher Scott Solomon. 1,000 years ago, a baby born in China with a mutation protecting it from an infectious disease absent from China (but present in Brazil for example) would have had no evolutionary advantage, he explains. This mutation would probably have died out after a few generations. Now, however, it would be entirely possible for this individual to migrate to Brazil and for his advantageous mutation to be transmitted and spread there.

In addition, with increasing migration, the phenomenon of “genetic drift” is declining. Genetic drift occurs in a small, isolated community where, with a few random mutations, a trait with no evolutionary advantage extends to all its members. In Quebec, the founding effect in Saguenay–Lac-Saint-Jean is a good example. The small group at the origin of this population carried alleles causing certain hereditary diseases. Over the generations, these mutated genes have finally been passed on to many of the inhabitants.

Genetic drift will no longer be an issue, confirms researcher Elisabeth Bolund. Existing variations may mix in several new ways.”

### 4. Medicine

Improved medicine and hygiene have significantly reduced the infant mortality rate in the West in recent centuries. However, this revolution still underway in several countries of the world continues to guide the evolutionary trajectory of our species.

“Before the demographic transition in Finland, one in two children died before adulthood,” says Elisabeth Bolund. Under these conditions, parents generally chose to give birth to large offspring in order to ensure the sustainability of their family. Genetic mutations favouring fertility were then strongly advantaged by natural selection. Then, when advances in medicine and hygiene resulted in almost all children surviving to adulthood, the size of the population exploded. One or two generations later, parents began to have fewer children and population growth stabilized. This pattern is typical of the demographic transition of a population.

In The Gambia, a small country in West Africa, the demographic transition is underway and its effect on development has recently been demonstrated. In 2013, a study, signed in particular by Alexandre Courtiol, revealed that between 1956 and 2010 the criteria favoured by natural selection in two Gambian villages had changed. At the beginning of the period, the small and corpulent women produced greater offspring than the other women in the villages. In the end, it was

women who were tall (over 1.57 m) and thin (body mass index under 21) who had relatively higher reproductive success. The demographic transition took place almost «spontaneously», explains Emmanuel Milot, due to the establishment of a clinic in the region in 1974. All of a sudden, infant mortality is virtually gone,” he said. However, researchers do not understand the link between slender morphology and reproductive success in the context of post-demographic transition.

In short, our evolutionary history, which began more than three billion years ago with the appearance of life on Earth, continues, but what about the future? If we want to know what the human of the future will look like, we must also define the environment of the future, argues Courtiol. It makes the exercise really speculative.”

According to the French biologist, the two main variables to monitor will be diet and exposure to pathogens. These two aspects of our physical and cultural environment are radically different from those of our recent ancestors. Our ultra-clean homes and compulsive antibiotic use minimize our exposure to pathogens. For now, the demographic transition is well advanced or has at least begun in all countries of the world, says Courtiol. But if suddenly there is a big environmental change, such as the development of very strong resistance of bacteria to antibiotics, the trend could reverse. We could go back to dying like flies and making babies like rabbits.” Then the evolutionary context would be completely reversed.

Climate change could also be the next page in the story of *Homo sapiens*, believes Scott Solomon. However, it is not the few degrees more that will redefine the rules of the game, but the indirect effects of this disruption. “Climate change will promote the spread of infectious diseases,” said the biologist. In addition, rising sea levels will drive large-scale migration.”

Finally, the human of the future will evolve in reaction to transhumanism, for better or for worse, thinks Emmanuel Milot. We are moving towards interventions designed to modify humans, such as genetic screening or genetic editing. It is difficult to forecast. These operations could change the patterns of natural selection,” says the Quebec professor. The infinite evolution of the human is well underway. The Ummites are pure beings, not polluted by too strong radiation from their star, unlike the Earth’s race whose DNA is damaged by the Sun’s ultraviolet rays, So it is not immediately that we will be capable of the same prowess as the Ummites, which have 4.5 million more years of evolution, we must remember that there are 4.5 million, men were only vulgar primates. In 1974, "Lucy" the oldest hominid fossil ever discovered, dated by specialists to about 3.2 million years before us (Toumaï, seven million years old, has not yet been found), which confirms that evolution is a very long process spanning thousands of years. Solar radiation is likely to reach the ultimate stage of evolution.

Here is the story of episode 13 of season 2 of the famous television series SLIDERS produced by Tracy Tormé.

In a world where the United States is under Spanish rule, sliders are immigrants. Another Canadian immigrant, Dennis McMillan, was arrested at the same time as Wade, Rembrandt and Professor Arturo. Quinn, managed to escape, finds refuge at Daelin Richards, a former high school friend of whom he was in love. But unfortunately, she can’t follow the sliders because McMillan hurt her brother and she prefers to stay with him. They then arrive in a world (a parallel Earth) where Quinn went to live in Seattle. Rembrandt suggests to Quinn that he should find Daelin in this world. He manages to fix things with his double and Daelin. But in the next world, where time runs backwards only for its inhabitants, sliders are accused of killing Daelin. In this world, the arrow of time does not point to the future but to the past. In this world, the arrow of time does not point to the future but to the past. Were the writers inspired by Ummites or Sakharov? In this world Daelin Richards and his companion form a couple of policemen. Quinn’s double

does not exist. At the beginning of the episode, the four sliders (Wade, Quinn, Rembrandt and Professor Arturo) are in prison, they arrived directly in the cell without coming out of the vortex as they usually do, Quinn is accused of the murder of Daelin. In this world Daelin does not know who Quinn is because there is no Quinn. The sliders do not understand why they are in prison, there has been no trial, what are they accused of? They do not know who took them to prison. They have a complete misunderstanding. The arrow of time is pointed to the past, time rotates counter-clockwise for the inhabitants of this universe, just as for the twin universe described by the Ummites, but this is another universe where there is another planet Earth where events have evolved differently. It is the only episode of SLIDERS where we find this particularity. There's also another episode where the Earth's Atmosphere has a pink-looking color a little bit like the OEOE 95 photo with the UMMO Atmosphere that the Ummites published on Twitter, but when the SLIDERS writers wrote this episode in 1995, they didn't know the color of the atmosphere sunsets of the UMMO planet. So it was the SLIDERS writers who were visionary in thinking about deflecting the light rays leading to an atmosphere of pink color. In this episode, there is mention of Stephen Hawking who predicted the possibility of an arrow of opposite time.

But what is interesting to observe is that this episode really describes what happens when people from a universe where time normally flows to the future enter a universe where time is oriented to the past. For sliders, the time continues to the future, but for the people they are in contact with like the lawyer or the judge it is the opposite, they go to the past and they do not realize it, This is very important because the time of the universe is an internal angle to any biological entity that goes back to the past for all the biological entities that make it up. In our universe, it is the same, but time is directed towards the future for all biological entities, from man to the simple cell. The arrow of time is global, valid everywhere in the considered universe. The speed with which time flows, it depends on the local gravity that is applied to the biological entity. Time is transformed in mass by the biological entity, mathematically a mass is a sum of several trillion angles and among these angles, there is one that indicates a meaning: trigonometric or anti-trigonometric. This angle is internal to the biological entity, which is why Quinn and his companions arrive at the end of the story, after their life sentence, so they arrive in prison even before they have been tried, they are subject to the laws of this universe whose time goes backwards, the minitor gave 1 week to stay in this world before traveling in another. If  $t=0$  is the time they enter this world, then they arrive at  $t=+1$  week for them, but for the inhabitants of this world it is  $t=0$  and when the week is over, the sliders will return at the time of their arrival while the inhabitants of this world will be at  $t=-1$  week, they will have arrived at a time when the sliders are not yet in this world, and they will never set foot there again.

When the four sliders are in prison, they wonder why they don't remember their exit from the vortex, it's because there was a first jump in time, as time flows the other way for this universe, they arrive directly at the moment when they should have left this world, that is to say in prison, so they will undergo the events but from the future to the past but the difference is that they will have conscience while the others from this world absolutely not. When the lawyer with the Spanish accent visits them in the cell in a condescending tone, she knows why they are in prison, because they have just been sentenced for the murder of Daelin Richards, and for complicity for Quinn's 3 comrades. But as time goes backwards, the lawyer does not know that for them, the trial has not yet taken place, so they will leave their cell in a few moments to start their trial. They're not leaving their cell to go to San Quentin State Prison on the Bay of San Francisco, but to go to the California Supreme Court courtroom, the laws of the universe have integrated these foreign masses that are Quinn and his friends by bringing to the end of the week where they must stay in this

world, so as not to violate the laws of physics because time flows at the same speed for everyone, but at trial; after the lawyer's pleadings, Quinn and Professor Arturo understand what is going on, they understand that the time goes backwards for the judge but not for them, So they plead guilty out loud and proudly and ask Wade and Rembrandt to do the same, which they also do; so they avoid the death penalty and the judge sentences them to life imprisonment where they will end their days in San Quentin prison. And there Wade and Rembrandt cry and at that moment, they are released from their handcuffs and they leave free from their trial. Professor Arturo and Quinn explained to their friends that time goes in the opposite direction for others, but not for them what they could not understand.

Of course, if time were to pass in the same way for them, they would not have done so, so they caused another jump that they brought them faster to the moment of their arrival in this world, before being wrongly accused of the murder of Daelin Richards. This expression "broken record" of the familiar register and the obsolete register is used - figuratively speaking - to signify amicably to someone that he repeats, repeats, or even repeats the same things over and over again. When Quinn and his friends pleaded guilty, they caused a temporal redundancy between the protagonists belonging to this world who go to the past and them who go to the future, which projects them more quickly to the future, and so the course of events is changed and they will not be questioned as they should have been. Quinn changed the normal course of events that would have occurred if time had flowed into the future; he was able to do so because he knew that the time within him and his friends goes in the opposite direction; so this confirms that it is the biological entity that is transforming time into mass, because it is Quinn's decision to plead guilty when he is innocent that caused an acceleration of time for him and his friends; the judge, the lawyer and the police officer who restrained him in handcuffs did not suffer this temporal acceleration, for them there was a point of inflection where time remained frozen, time forfeited to another reality. The reality where he was to be arrested, accused of the murder of Daelin has disappeared.

This modification of the course of events does not violate the laws of physics because on the one hand the sliders would have left this universe returning at the time of their arrival and on the other hand, there is no violation of the mass because we can travel in another pair of universes without there being a problem of conservation of the mass provided that we do not stay there, it is the two twin universes that must keep the same mass in absolute value, between them, which means that a twin universe where the arrow of time is opposite can accept a mass from another pair of universes. At the end of the episode, Quinn intervenes to neutralize the shooter who misses his target, Daelin is saved. The course of events changed because Quinn was free and knew that Daelin was going to be killed and that we were going to take him for the shooter, so he acted faster than expected. An intelligent being changed the course of events without traveling in the past, but only because his internal clock (an internal angle "TIME") turned in the other direction, towards the future whereas for Daelin, his internal clock was going towards the past. Time is therefore linked to the biological entity that transformed it into a mass, and not to the universe in which it is situated. The Ummites are therefore right.

Her boyfriend Dennis McMillan, also a policeman, intervenes and kills the shooter. They reproach Quinn for having intervened, they do not know that without her intervention, she would have died, because they are going to the past, so the future for them has not yet taken place, but for Quinn it did take place, that is the whole temporal nuance of this story. The striped disc is nothing other than the trigonometric circle that rotates counter-clockwise (Daelin's universe) and Quinn and his friends are foreign bodies that go in the opposite direction and have all the time to create temporal redundancies by adopting erotic behaviors, that go against logic, The lawyer was telling the judge



FIGURE 51A: Quinn is absorbed by the vortex as he turns his back on it, he leaves the world where the arrow of time is reversed exactly as he entered it, but in reverse. Quinn goes to his future, which is here his past. It went from  $t=0$  to  $t=+1$  week but this world from  $t=0$  to  $t=-1$  week.

that Quinn was out of his mind when he pleaded guilty. Quinn's internal angle was going the other way than that of the lawyer and the judge, by shortening the trial, he allowed his internal angle 'TIME' to interfere in the angular velocity of the other internal angles of the people present at the trial apart from his 3 friends. Time froze for the judge and the lawyer and the policeman removed his handcuffs instead of handcuffing him to direct him to the prison. They all became statues frozen in time while Quinn and his friends watched them. At the end of the episode, the gliders see the planet Earth appear in the sky that pops up in a window, they do not understand, no one understands, Daelin, Dennis, the four sliders, are amazed, and Professor Arturo explains to Quinn that by acting this way, he changed the course of events, so the reality "Daelin dead and Quinn convicted of murder" that disappeared went to another universe, that of the Earth that appears in the sky, the bifurcation of events created another parallel universe. Quinn and his friends didn't travel in time, he changed Daelin's future because she was going to her past, she was going to her future, which was to leave this universe when the timer indicated the time to open the wormhole. The biological entity and time are one and the same couple, by transforming time into mass the living being is prisoner of his body (mass) which contains the internal angle, the sliders continue to go towards their future, independently of the arrow of time of this universe. Professor Arturo opens the wormhole where they arrived without remembering it, and the wormhole opens, Quinn was inspired by the fact that he was turning his back on the wormhole. For the record, Quinn's lawyer who spoke with a Spanish accent was dressed like a beautiful slut from what I remember. She was really a whore, I hate women lawyers because they killed my mother and broke her adolescence. When I saw this bitch frozen in time until Quinn was released from her cuffs, I felt happiness.

He usually dives inward, but this is the time that sucks him in the same way that he arrived in this world, and sliders can thus quitetr this world, for another.

But in the WAAM-WAAM (infinity of universe pairs), all universes have a universe that goes to the past, and another (twin universe) that goes to the future.

But in the WAAM-WAAM (infinity of pairs of universes), all universes have a universe that goes to the past, and another that goes to the future, travelers who invert their mass and that of dying spacecraft, also inverse their internal angle "TIME", this is the difference between wormholes that require exotic matter (negative mass) to be opened (series SLIDERS or STARGATE SG1) and intersettlary journeys of the Ummites, which invert their mass, Exotic matter is their own mass and that of the ship. It is theoretically possible to travel to another universe of negative mass but on condition of reversing its own mass. If we travel in a twin universe of negative mass of another pair of universes, we would theoretically be in Quinn's situation (provided we interact with the environment), because the mass is foreign to the pair of universes, not to violate the principle of mass conservation, it always follows the arrow of its original universe, it is negative but follows the arrow of time directed towards the Future.. But during their journey, the Ummites who enter a twin universe of negative mass of another pair of universes, do not interact with the elements of this universe, although they are not likely to change the course of events for this other pair of universes. They are foreign bodies in the other pair of universes (imaginary mass that goes to the future) while when they travel in the twin universe (of our universe); they are negative masses that go to the past. The biological entity is subject to the laws of its universe pair, in which the constants were set at the cosmological birth called "BIG BANG". The bifurcation of parallel universes took place at the level of the adjustment of cosmological constants which are not the same in the different pairs of universes. There is no bifurcation at any given moment (decoherence) as stipulated by the Heisenberg uncertainty principle, the uncertainty took place at the time of the birth of this infinity of parallel universes (or pairs of cosmos) that was made during the BIG BANG, common point where all the pairs of universes are born.  $C$  being the speed of light in the vacuum, we go from  $C=0$ ,  $C=1$ ,  $C=2$ ,...  $C=300000$  km/sec (our pair of cosmos), ect... up to  $C=+\infty$ , these differences in values on one-verse constants occurred at the time of the birth of this infinity of pairs of cosmos, and therefore there is not necessarily another universe where Daelin is dead and where Daelin is alive, but a universe where the Earth exists and where the Earth does not exist, but is replaced by something else. Daelin is dead and alive (TETRAVALENT LOGIC).

Constants serve as tools to test the limits of our scientific theories (Theories of Newtonian Gravitation, Newtonian Quantum Gravitation, Quantum Mechanics, Quantum Electrodynamics, Special Relativity, Newtonian Mechanics, General Theory of Relativity, Strings). In the 17th century Newton wrote the "Principia" (1687), many consider that this is the foundation of modern physics because he introduces the notions of space, time, universal gravitation and universes in the sense that the laws are unified. For modern physics to develop, it needs universal laws to be able to repeat experiences, here and elsewhere, today and tomorrow. These universal laws operate within a framework that is the Universe. It is at this time that we move from the notion of the world to the notion of the universe. Constants therefore play a central role in physical theories. Paradoxically the constants can vary over very large periods of time, however the constants allow to structure the domains of validity of the different physical and astrophysical theories. The classes in 3 categories:

Table 9: The cosmological constants

State	Amplitude	Probabilities;
Speed of the light	c	299 792 458 m/s
Astronomical unit	au	149 597 870 700 m
Light-year	ly	9 460 895 288 762 850 m
Parsec	pc	30 857 656 073 828 900 m
Constant gravitational	G	$6.673\ 84\ 10^{-11}\ \text{m}^3.\text{kg}^{-1}.\text{s}^{-2}$
Constant cosmological	$\Lambda$	free parameter 0 or $\neq 0$
Constant of Hubble	h0	73 km/s/MPC
Constant of Boltzmann	k	$1,3806488\ 10^{-23}\ \text{J.K}^{-1}$
Constant of Planck	h	$6,62606957\ 10^{-34}\ \text{J.s}$
Planck length	$l_p$	$1.616\ 24(12)\ 10^{-35}\ \text{m}$
Planck time	$t_p$	$5.19121\ 71(40)\ 10^{-44}\ \text{s}$
Planck mass	$m_p$	$1.672\ 621\ 71(29)\ 10^{-27}\ \text{kg}$
Planck Temperature	$T_p$	$1.41679\ \times\ 10^{32}\ \text{K}$
Constant of fine structure	$\alpha$	$7,2973525698(24)\ 10^{-3}$
Proton mass	$m_n$	$1.674\ 927\ 28(29)\ 10^{-27}\ \text{kg}$
Mass of electron	$m_e$	$9.109\ 382\ 6(16)\ 10^{-31}\ \text{kg}$
Muon mass	$m_\mu$	$1.883\ 531\ 40(33)\ 10^{-28}\ \text{kg}$
Mass of the lepton $\tau$	$m_\tau$	$3,167\ 77(52)\ 10^{-27}\ \text{kg}$
Boson mass Z0	$m_{z0}$	$1.625\ 56(13)\ 10^{-25}\ \text{kg}$
Boson mass W	$m_W$	$1.4334(18)\ 10^{-25}\ \text{kg}$



- Constants characterize a given physical system, for example the mass of the electron.
- Constants describe a class of phenomena, for example the gravitation constant.
- The universal constants which appear in many laws of physics, for example the speed of light although the speed of light can be classified in the class of electromagnetic phenomena.

In summary, to characterize a constant among these 3 classes, depends on the knowledge one has of physics, says Jean-Philippe UZAN (IAP).

The 3 fundamental constants of nature are:

- The speed of light  $C$  or  $c$  (electromagnetism, relativity) is the speed of propagation of electromagnetic waves, it is a speed limit for the propagation of information, a speed that cannot be exceeded.
- The gravitational constant  $G$  (Gravitation) is a constant of the force of attraction between the bodies, the force of attraction between two massive bodies is proportional to the product of their mass and inversely proportional to the square of the distance separating their respective centre of mass.
- The Planck constant  $h$  (Quantum Mechanics) describes the size of the quanta. This constant is used in quantum mechanics to link the energy of a photon to its frequency. This is an extremely small value.

In the standard model and general relativity, there are 20 constants. In addition to these constants, we use 3 fundamental units of physics, which are the kilogram, the meter and the second. The value of a constant is closely related to the arbitrary value of the metre, kilogram and second. This is why we define rather ratios, mass ratios or ratios of force to avoid calculation errors. Thanks to constants, for example, by measuring the distance between the Earth and the Moon, we can test the universality of free fall. We can verify that the Earth and the Moon fall in the same way in the gravitational field. With constants, we can wonder if the absorption spectrum of the different elements is the same as it was 10 billion years ago. Scientists made the measurement and the electromagnetic interaction was lower by 0.001%. Only the outer layer of the star is visible, it is the only source of information about the star. Also, to know the constitution of a star we look at the electromagnetic interaction between the light emitted by the star and the elements it passes through. The light emitted by the photosphere is that of an incandescent body, its spectrum is continuous. But in reality, the spectrum observed from Earth shows rays. The continuous background of the spectrum is streaked by numerous absorption lines. A part of the light emitted by the photosphere is absorbed. Thus, this absorption is the signature of the chemical elements present in the star's atmosphere.

For the record, Quinn is nicknamed Q Ball in the SLIDERS series because in addition to being a brilliant student in quantum mechanics, He plays at a high level in the university team at the University of California in San Francisco and Q Ball is a 2019 American documentary film about the San Quentin Prison basketball team. Strange coincidence?

You have probably heard of the Big Bang theory, which describes how the Universe was "born" from a very dense and hot mass of matter about 13.7 billion years ago. A gradual expansion, like a balloon being inflated.

But before? What was there before the Big-Bang?

Is it possible that the Universe was born from "nothing"?

"It is not excluded, but it is (very) (very) complicated to answer this question," warns Johan Richard, astrophysicist.

A question beyond physics "It is a question that comes up against the limits of our knowledge," emphasizes the researcher. "It clearly takes us beyond physics, even if different models exist at the moment."

It is possible that the Universe was born from nothing, that is, from the vacuum.

Quantum theory allows that a quantum fluctuation of the vacuum is at the origin of the appearance of particles. In quantum electrodynamics, the energy contained in the Universe produces matter. The quantum decoherence which makes that one tends towards a state could not be reached at the level of these fluctuations of the BIG-BANG, that is why there is an infinity of pairs of universes with speeds of light and different gravitational and Planck constants. The physical laws pre-exist the fluctuations, for example the law  $G/c^2$  is a constant for all pairs of universes equal to  $7.4256711 \cdot 10^{-22}$  in the international measurement system.

This law pre-existed before the Big-Bang, it is found in the solution of the field equation and in Einstein's constant. The gravitational constant  $G$  must adapt according to this constant each time another universe is created with a new value for the photon velocity in the absence of mass deformation.

"When we have a model, we know in which context it applies. But in this context, we do not have a model that works," summarizes Johan Richard. Why?

In its beginnings, the Universe was extremely dense: the appropriate model is a priori that of general relativity.

But in its early days, the Universe was also extremely small:  $10^{-33}$  centimeters, smaller than a particle. The appropriate model would then be rather quantum mechanics.

And a combination of the two?

« General relativity and quantum mechanics don't work together at all. We need another, unified physics, and that's what everyone is looking for! »

Until string theory, parallel universe theory or brane cosmology offer (perhaps) a satisfactory description of the birth of the Universe, this ultimate unknown will continue to fascinate poets... and others!

Quantum mechanics does not agree with general relativity because Earth scientists do not apply the superposition of states to objects of the infinitely large (TETRAVALENT LOGIC) what the astrophysicists of UMMO do and do not translate general relativity with angular magnitudes representing the masses of the infinitely large on the one hand and the behavior of the subatomic particles characterized by the rotation of two IBOZOO UU (one linked to the system and the other free) on the other hand. The bodies whose trajectory is described by Einstein's equations (Mercury's perihelion advance), also translate the behavior of particles on a discrete grid where each variation of index corresponds to the jump of an atomic particle from one orbit to another orbit of another atom (Heisenberg's Uncertainty Principle which says that we cannot know the speed and position of a particle simultaneously).

Ultimate quest, terminus or Holy Grail of physics, Einstein's unfulfilled dream... the words to speak of her are rarely half-measures. "She is the famous theory of everything, the edifice that makes it possible to describe. from a single fundamental law, all the phenomena of nature, from the interactions between elementary constituents to the evolution of the entire Universe. Fact. the various physical theories currently in force only describe parts of the Universe. While a theory of everything would describe the entire Universe, allowing in particular access to the big bang, this

particular moment when, phenomena from the infinitely small to the infinitely large, everything held together. The discovery of the theory of everything would provide the key to a global understanding of the Universe.

They miss this theory of everything because of an ingenious conception of the warping of space, the fixed folds of space identified by Einstein and the variable folds of space (shortened trips over great distances) are a response to quantum sinusoidal stationary waves, this response translates into masses, and these masses are sums of angles both in the infinitely small (quantum gravity) and in the infinitely large (general relativity). One of its angles is time, which enriches the system in which it finds itself by rotation of its axes, which leads to its aging, and as the balance of a living organism of macroscopic size is fragile, it ends up dying of old age, whereas a very simple system like an atom can age without dying much longer because the elements that compose it are maintained simply by the weak interaction. The weak interaction allows all leptons and quarks to exchange energy, mass and electric charge, allowing them to change families and flavors.

The weak interaction has a very short range, and its influence is limited to the atomic nucleus.

Photosynthetic organisms are photoautotrophic, which means that they are able to synthesize their biomolecules directly from mineral compounds - most often carbon dioxide CO<sub>2</sub> and water H<sub>2</sub>O - using light energy received from the sun. However, not all organisms capable of using light energy for their metabolism are necessarily photosynthetic: the so-called photoheterotrophic organisms synthesize their biomolecules from organic compounds, not CO<sub>2</sub>, as carbon sources.

In plants, algae, cyanobacteria and several bacterial taxa (green sulfur bacteria, green non-sulfur bacteria), photosynthesis releases oxygen O<sub>2</sub>. This is called oxygenic photosynthesis. Although there are differences in the biosynthesis carried out by these organisms, the general mechanisms remain quite similar from one species to another. There are, however, bacteria that possess anoxygenic photosynthesis, which consumes CO<sub>2</sub> but does not release O<sub>2</sub>.

Carbon dioxide is converted into carbohydrates through a process called carbon fixation. These are endothermic redox reactions, so this process needs electrons to reduce CO<sub>2</sub> to sugars and energy to make these reactions thermodynamically favorable. Photosynthesis is broadly the reciprocal of cellular respiration, in which organic compounds such as glucose are oxidized to carbon dioxide and water to release energy and produce reducing coenzymes. However, these two processes involve different chemical reactions performed in different cellular compartments.

Photosynthesis occurs in two phases: in the first phase, light-dependent reactions capture light energy and use it to produce a reducing coenzyme, NADPH, and a chemical energy-storing coenzyme, ATP, while in the second phase, light-independent reactions use these coenzymes to absorb and reduce carbon dioxide.

Most oxygenic photosynthetic organisms use visible light, however they are only active at certain wavelengths (i.e. they absorb these wavelengths by their photosynthetic pigments) for chlorophyll a, the action spectrum includes blues and reds (wavelengths around 440 and 680 nm), other pigments absorbing other wavelengths such as chlorophyll b, xanthophylls, or carotenoids, play a role in photosynthesis, so some photosynthetic organisms use the near infrared or, more particularly, the far red (around 800 nm wavelength).

Finally, it should be noted that, although photosynthesis is a biological process specific to plants, algae and certain microorganisms (including protists and bacteria), there is also an animal, the sea slug *Elysia chlorotica*, which is known to be the site of a photosynthetic process taking place in chloroplasts that it does not produce itself but that it absorbs with the algae on which it feeds.

By feeding, a biological system absorbs or swallows time, digests it and transforms it into mass, this is the growth of individuals, weight gain, and plant growth via photosynthesis. These chemical

reactions that occur correspond to the synthesis of biomolecules that allow the living organism to keep itself alive because the balance of its functioning is fragile. Obviously this is not the case of an atom (a much less complex system), because these constituents are maintained by weak interaction for non-radioactive atoms, while for radioactive atoms, it is responsible for their decay is the beta decay. We speak of beta minus ( $\beta^-$ ) or beta plus ( $\beta^+$ ) decay depending on whether it is the emission of an electron (negatively charged particle) or a positron (positively charged particle). The angle "TIME" of the water molecules combines with the angle "TIME" of the sun rays in order to sum the angles of this mineral enrichment between them and to integrate them to the existing sum of angles (sum+integration), this summation of angles makes the length of the biological tissues grow. The result is that the plant grows, but this growth is done according to rules which remained before the BIG BANG and which are independent of the quantum fluctuations. In nature, for example, the Fibonacci sequence appears in many biological forms, such as the branching of trees, the arrangement of leaves on a stem, the fruits of the pineapple, the blossoming of the artichoke, the unfolding of the leaves of ferns, the arrangement of a pine cone, the shell of the snail and the arrangement of clouds during hurricanes. As for daisies, they most often have a number of petals derived from the Fibonacci sequence.

In the Asteraceae, in the inflorescences in capitulum, the arrangement of florets on the receptacle forms regular spirals, dextrous and senescent, which follow the rules of phyllotaxis in which we can find the Fibonacci sequence.

Honey bees have haplodiploid reproduction: an unfertilized egg will give a male and a fertilized egg will give a worker or queen. Thus, a male will have a mother, while the workers and queen will have a mother and a father. Therefore, a male's pedigree consists of one parent, two grandparents, three great-grandparents, five great-great-grandparents, etc.; it is a Fibonacci sequence. Another example is the center of a sunflower. The receptacle forms regular spirals, dextrous and senescent, in which one can find the Fibonacci sequence.

The growth of biological entities and species obey mathematical laws. In the Fibonacci sequence, which is a sequence of integers in which each term is the sum of the two preceding terms, we sum vector rays (OAWOO) carried by 2 axes (IBOZOO UU 1 and 2) which grow, which gives a spiral, they are summed two by two (we take each time the last two), so we obtain a sum of angles.

The computation of the n-th term of the Fibonacci sequence via the recurrence formula requires the computation of the previous terms. On the contrary, a functional expression of the Fibonacci sequence is an expression where the computation of the n-th term does not presuppose the knowledge of the preceding terms. Binet rediscovered a formula in 1843, which had already been obtained by de Moivre in 1718 and by Euler in 1765. This functional expression is called Binet's formula  $F_n = \frac{1}{\sqrt{5}}(\phi^n - \phi'^n)$  with  $\phi = \frac{1+\sqrt{5}}{2}$  and  $\phi' = \frac{1-\sqrt{5}}{2} = -\frac{1}{\phi}$ . As the Fibonacci sequence is linearly recurrent of order 2, its characteristic equation is a second degree equation:  $x^2 - x - 1 = 0$  whose two solutions are  $\phi = \frac{1+\sqrt{5}}{2}$  and  $\phi' = \frac{1-\sqrt{5}}{2} = -\frac{1}{\phi}$  where  $\phi$  is the golden number. The sequences  $(\phi^n)$  and  $(\phi'^n)$  then generate the vector space of the sequences verifying  $u_{n+2} = u_{n+1} + u_n$ . It follows that  $F_n = \alpha\phi^n + \beta\phi'^n$  where  $\alpha$  and  $\beta$  are constants to be determined from  $F_0$  and  $F_1$ . With the initial conditions  $F_0 = 0$  and  $F_1 = 1$  we obtain  $\alpha = \frac{1}{\sqrt{5}}$  and  $\beta = -\frac{1}{\sqrt{5}}$  which leads to the functional expression (These calculations remain valid for n negative integer when the sequence is extended as below).

When n tends to  $\infty$ ,  $F_n$  is equivalent to  $\frac{\phi^n}{\sqrt{5}}$ . More precisely,  $\phi^n$  tends to infinity and  $\phi'^n$  tends to 0 because  $|\phi'| < 1 < \phi$ .

In fact, from rank n=1, the second term  $\frac{\phi'^n}{\sqrt{5}}$  is small enough that the Fibonacci numbers can be

obtained from the first term only:  $F_n$  is the integer closest to (and it is greater or less than it, depending on the parity of  $n$ ).

There are other proofs of Binet's formula, such as the Z-transformation and the technique of generating functions. Indeed, since the  $F_n$  sequence is equivalent to  $\frac{\phi^n}{\sqrt{5}}$ , thus the sequence  $\frac{F_{n+1}}{F_n}$  is equivalent to  $\phi$ , thus converging towards  $\phi$  (gold number).

Note that once discovered, this formula can also be proved by recurrence (including for negative integer  $n$ ).

The sequence can be extended to negative indices, we speak of negafibonacci numbers. The recurrence formula also defines them from close to close by the formula  $F_n = F_{n+2} - F_{n+1}$ .

So around 0, the following is  $F_{-6} = -8, F_{-5} = 5, F_{-4} = -3, F_{-3} = 2, F_{-2} = -1, F_{-1} = 1,$

$F_0 = 0, F_1 = 1, F_2 = 1, F_3 = 2, F_4 = 3, F_5 = 5, F_6 = 8.$

We notice, on these first values, that

- if  $n$  is even then  $F_{-n} = -F_n$
- if  $n$  is odd then  $F_{-n} = F_n$

or more synthetically:  $F_{-n} = (-1)^{n+1} F_n$

This can be proved for any integer  $n$ , by the Binet formula above, or directly by recurrence.

We notice that for negative indices the Fibonacci sequence alternates between positive and negative integers which means that the biological entity alternates between a positive and negative growth, a bit like if you press the gas pedal of your car, you go in reverse. A negative mass works with an opposite arrow of time, so we get the behavior of a biological entity of negative mass by analyzing the behavior of the terms of the sequence for negative indices starting from 0, The plant alternates between positive and negative integers that are increasingly larger in absolute values. So it is a growth which will oscillate between -infinity and +infinity. So a biological entity of negative mass has no sense and will behave in an incomprehensible way, it will grow when it has less consumption, and shrink when it is fed. The Fibonacci sequence is a mathematical law that describes how the plant will transform time into mass. We can see that there are important biochemical disturbances because the more the plant will consume energy in the form of light rays or water in the water table, the more its growth will oscillate in an important way, we do not know any more if the plant goes towards +infinity or towards -infinity.

So a biological entity of negative mass can theoretically not survive because its growth no longer makes sense, so the negative mass universe is a universe that serves just for travel between the stars. One does not move in the twin universe for pleasure, according to the solutions of relativity, in theory time no longer flows during the journey, on the one hand because  $dt=0$  during the passage in the twin universe of negative mass (Schwarzschild solution after making the appropriate angular variable changes views beforehand). Time no longer elapses for travelers exactly like the travelers of the film Planet of the Monkeys, space-time is pure imaginary, distances are shortened, as we have represented it with my sheets of paper; so time always goes in the opposite direction in this twin universe, but for travelers, it no longer gets old, so old no longer ages. This trip lasts about 6 months; The ship's recommended cruising speed is about a third of the speed of light, the Ummites eltters do reissue to a lithium plasma varying at very high frequency. There is therefore no risk for the traveller and the nave to enter the twin universe. In the letter D57-2 the Ummites recount their first journey on Earth. First voyage of exploration of the EARTH. Date: 30/01/1967 To: Mr. Villagrasa Original language: Spanish Notes: Letter 2 - out of a total of 30 pages. FIRST

## ARRIVAL NEAR EARTH.

On January 7, 1949, after the exploration of the planets NEPTUNE and MARS by our displaced brothers in two OAUOLEA UEUA OEMM (NEFS SPATIALES), they arrived near a new OOOYAGAA with an atmosphere much denser than that recorded on the previous star. The first exploration was carried out in helical orbit on an elliptical trajectory whose perigee was 337 kilometers from the Earth and the apogee 398 kilometers.

During the exploration of Neptune we had already received a wide range of radio emissions from the Earth that allowed our brothers to identify this Planet. The presence of higher life on it was therefore evident. No other source of emission was identified and it was reasonably inferred that the rest of the OYAA (COLD BODIES) gravitationally related to OOOYIA D57-0(D57-4e) (called by you SUN) had no intelligent biological forms or at least had developed techniques. This last reasoning led the explorers to go to an OYAA which they codified with the name D57-0(D57-4f) (which you know as MARS). This first examination was conducted at a height of 290 KOAE. (One KOAE is approximately 8.7 kilometres), revealed the absence of an atmosphere dense enough to allow the external development of complex pluricellular beings. The holes of multiple meteorite impacts and the crystalline structure of the soil studied by our remote sounding instruments, revealed the absence of a bacteriologically active and productive life of soil decomposition.

at least in the small areas that have been explored. Later on we discovered on this OYAA not only protein forms and aminoacideas but also unicellular and simple plant pluricellular beings. (You will soon discover them).

The strict examination program of this inhabited OYAA began to be implemented. First of all the rationalization of the measures for the escape in case of attack obliged us to maintain a very high speed of translation which hindered the accuracy of the observations. It seemed obvious that the OOOYAGAA (Astre Carré) recorded by our UMMO was precisely the one we were analyzing (I explain myself in the plural by referring to my brothers because I was on UMMO).

We knew that if you had attained a certain degree of civilization, you would instantly detect our presence. In case this presumption is false, the criterion of not manifesting our presence would then be imposed. If we wish to study a Civilization in all its purity, our presence should avoid causing social disturbances, abnormal dynamics in the technical means of defense, detection and interception as well as serious disturbances in the means of communication relating to the probable information network. A social network thus distorted or disturbed by the presence of foreign beings cannot be studied analytically in all its purity. You will find a comparison with a bacteriologist who wants for example to study a new strain of spirochaetes. It should not disturb the culture broth with new germs that would alter the biological process of the former. If he did, in front of the field of his microscope, the elementary forms of conduct of these microorganisms would be abnormal.

## OBSERVATION

It is for this reason that our presence among you is unofficial: a few people with whom we have contact, especially of North American and Australian nationality, often ask us and ingenuously why we do not make ourselves known officially.

It is curious to note that among these, there are earthly men who, with their erudition and scientific training, should themselves understand the real causes that force us to inhibit ourselves. We believed at the time that you would be more consistent. We understand that the average Earth man with few intellectual faculties maintains the stupid hypothesis that: both we and other alleged galactic visitors should present ourselves with one of EUA OEMM (flying saucers) in the middle of a large New York square, dressed in a silver jumpsuit and with a shotgun of deadly rays as in the Science Fiction news. That is to say, if you consider us eager for an absurd popularity. Your

embryonic and primitive reasoning seems to be this: "If these beings come from another star, why do they not make themselves known and why do they not prove it?" Any expert in terrestrial philosophy this sophistry "repeats of principle".

We, (and we presume that it is the same for other visitors who may be among you) have absolutely no interest in the terrestrial social network being absolutely certain of our presence.

From the beginning our brothers took precautions to go completely unnoticed. As we were soaking up your culture and learning the laws of earthly social psychology, we realized that revealing our presence to a few people would not be dangerous because the other members of society would react with disbelief and that is what actually happened. Do you think that if it were not the case, we would have taken the risk of getting in touch with you? And even three people in the advertising profession, with whom we maintain conversations, have published our stories (in three newspapers or magazines in Poland, Spain and Canada) and logically their readers have adopted the natural skeptical posture we hoped for.

Thus such an attitude would be modified and we would present ourselves ostensibly, by bringing proof of our identity, before the terrestrial press, and governmental or international technical bodies. Posture that we have no intention of adopting at this time.

In this way we were able to cover two objectives. A direct contact with a group of earthly inhabitants to exchange facts concerning our mutual civilizations, avoiding to disturb the rest of the earthly society which remains on the sidelines of a situation he considers legendary because of its lack of evidence.

Unfortunately, we were unable to reach our second objective. Go unnoticed by the technical bodies of States; United States, France, England, Soviet Union and we think with reason that Italy, Germany and the Argentine Republic are aware of our presence and are concerned even though we have informally shown them that their fears are unfounded. In view of the fact that knowledge of such a situation can provoke reactions of anxiety and panic among the civilian population, the chancelleries of these governments can be reassured at least with regard to the brothers of UMMO. We will not make ourselves known for the moment, because the risk that this will exceed the few scientists or writers with whom we are in contact is NIL, with the exception of the few people with a high critical mind included among the family and friends of our correspondents.

The others, saturated with prejudices, with narrow mental frameworks and aware of the risk of fraud that can insinuate in our revelations, will maintain a skeptical posture to excess.

For this we ask you not to be excessively zealous in disclosing to the people of your entourage the reality of our existence. Thus you will not be mistaken for an enlightened or a mentally disturbed and your own professional stability will not be attacked. To those who, without a first analytical examination of the facts, show a skeptical attitude, believing themselves thus "intelligent", approve them without any comment.

#### FIRST VISUAL EXAMINATION OF THE EARTH LAYER BY OUR FRERES

The abundant cumulus clouds at that time on the American and South Asian continent, prevented us from observing clearly the dense network of communications (later identified as tracks and tracks, although initial misidentification was thought to be pipe). This allowed us to evaluate by a first estimate your degree of technical civilization (we no longer have any road networks for a long time). Your first aircraft was detected near an archipelago where we later identified the Bahamas. The image was agandie in the on-board laboratory and its morphological characteristics were analyzed. This was the first indicator of the technological level that we were able to obtain. During the 86 UIW the analysis was able to go down to a height of 0.62 KOAE on an area identified then as the south-west of the Swiss Republic (SWITZERLAND), images of urban and industrial centers as

well as railway nodes, concentration of flora (Forests and plantations), floating structures on the Atlantic Ocean and fragments of streams and multiple samples of atmospheric gases at different altitude levels.

#### OBSERVATION

Careful analysis, even if it prevented the distinction of facial features, offered no doubt of sexual identification thanks to the localization of the female breasts on some silhouettes. But it was impossible to distinguish small details in clothing. We also discovered that the YIE (Woman in our language) were characterized by an abundant cranial hair, although it could be any fibrous wig on the head. Unfortunately some images of YIE (clearly differentiated by the bust), had legs covered like men, which had introduced a controversy on the differentiation of clothing of both sexes.

This analysis was very important because our brothers, selected to move to Earth, had to be provided with EEUE (clothes) similar to those of the Earthlings to go unnoticed. Unfortunately, it was not possible for us to detest either the composition of these (we did not know if they were fibrous tissues until we arrived) nor the most essential details of their manufacture.

A second point that was much debated was that of the most suitable area among those explored for the descent of our brothers. It had to be a depopulated area, but not a desert because otherwise any careful contact with the inhabitants would have been impossible.

This, from your point of view, seems very simple because it was sufficient to examine the topographical UULAYA (Captured Images) and then select a semi-wild geographical environment. But we did not know at that time whether the men of the Earth lived in underground "ants". Don't forget that we focus on cities and open-air construction only when it comes to what you call industrial zones. While the rest lives scattered in the XAABI (emerging houses) that can fold underground.

In addition, other inhabited planets concentrate human beings in large underground colonies. Was it the same for this Ayaggaa (Planet Earth)? The buildings that we know today match your homes were initially identified as factories. But what intrigued us most were the images obtained from long vertical tubes located in all these constructions, nozzles located in the vehicles that our cameras were able to capture, sending dark-coloured vapours and aerosols (smoke).

You cannot imagine the stupor that caused us something familiar to you; the spectral analysis of such gases with a high dose of carbon monoxide, tar and hydrocarbons. We imagined then that the physiological organisms of the earths could not live in an atmosphere of oxygen and nitrogen without the gases mentioned previously and that is why you added them to the environment air to make it the most breathable. This had filled us with concern because we were thinking about the consequences that such an artificial climate could have for us.

(Once we arrived on Earth, as we will tell you later, our hypothesis was corroborated by seeing you with these tobacco cylinders that we interpreted at the beginning as gas generators for breathing, by marvelling even more by observing that children and other individuals did not wear them).

I told you that strong discordances had arisen among the technicians at the time of selecting the terrestrial zone where the descent of the shippers was to be realized because we risked, by choosing the apparently least populated place to locate us precisely within an underground concentration and to be thus detected and even destroyed by you.

The detailed study of the images corresponding to various aircraft gave us an indication of your technical level. Some still had aerodynamic propeller traction. We carefully examined the welds made between the metal layers (we did not yet know that it was an aluminum alloy) and the structures of some of the auxiliary mechanisms of these aircraft.

There was one element that made us conceive a totally aberrant idea in relation to the Terrestrial



Social Network. Several hundred radio emissions were recorded from many points on this planet in a very wide frequency range. Thus we were surprised to note the enormous linguistic multiplicity and our specialists in acoustic techniques, by classifying the languages which presented a homogeneity in phonemes, have sometimes identified two or three as being a single language. Our attention was strongly drawn to the fact that a large part of the broadcasts, captured in relation to metric wavelengths, had the same type of binary language (short pulses, long implusions) already captured in the first message.

But in trying to translate it in the same way as the first we realized our mistake. What could be the real code used by you? A conclusion was reached: the inhabitants of OYAGAA (planet EARTH) used a multitude of local languages and to connect the different communications, you had to logically use a unique international language based on short and long whistles whose code was still indecipherable for us. ( Later we found that such a hypothesis was very simplistic because the MORSE code serves as a vehicle for many languages). To complicate the panorama even more, we also captured Vidéo de Télévision programs.

But we did not know that such frequencies carried an image. As we interpreted them acoustically and all the recorded ones came from North America, we thought that in this area we spoke three languages the last (video signals) did not have the slightest resemblance to the others.

The enormous linguistic anarchy (further complicated by our errors of interpretation) added to the immense range of technical differences observed with the multiple facilities and constructions of the different zones of the planet, filled us with real perplexity.

It was thus impossible to have a coherent panorama of what the Terrestrial Civilization could be. On the other hand, the atmospheric composition obtained by various samples at various points in OYAA and at various altitudes showed us that we could descend without the help of auxiliary breathing equipment.

But the very important question of the enantiomorphic structure of protein molecules remained to be solved. Were they dextrogyres or levogyres? If the biological molecules of beings and foods were the opposite of ours, it would be impossible for our digestive organs to assimilate them and we would be doomed to hunger if we did not bring our own food. It was therefore necessary to equip the shippers with other auxiliary equipment to purify the water in case it had toxic salts in suspension, perhaps assimilable by the inhabitants of OYAGAA (TERRE) but not by us.

The policy to be followed with you was carefully elaborated. Violent defense in case of attack. Initiation of official contacts if we are detected and controlled peacefully. Absolute neutrality and attempt with all techniques within our reach to go unnoticed. This should be done in the event that it is impossible to pass unnoticed by the Earthlings.

To go unnoticed, an underground observatory would be set up in the right rural area and underground the most accessible observation methods and techniques would be studied.

Even on this point we were mistaken as we shall see later, for we realized with astonishment that it was perfectly possible to mix with you without provoking any surprise.

Immediately the programme of preparations was implemented and the people who would make up this first expedition were carefully selected from the beginning. Of the six selected, there were only two YIIE (so we call women). They all learned long fragments of the different captured languages (completely ignoring their meaning) simply to familiarize the EESEE OA (SUBCONSCIOUS) with the phonic structure of the terrestrial acoustic expression codes. They were able to examine all the information material captured and became familiar with the multiple plant forms whose images were the clearest of the terrestrial flora seen. Few things in truth for some Oemii who were going to be confronted with an unknown world.

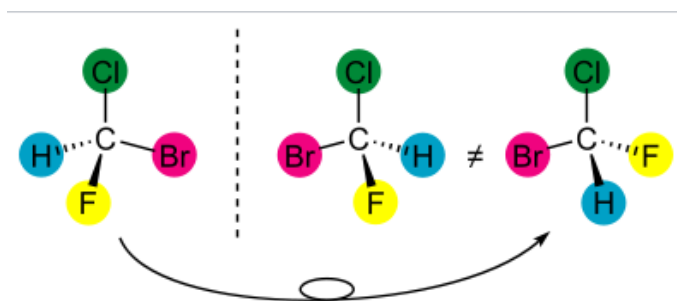


FIGURE 51B: The first two molecules are the mirror image of each other. If we turn the first we see that it is not superimposable on the second. The Ummites are right, there is a rotation of axes in molecules (for subatomic particles, it's the same thing), the elements reduce to angles who turn.

The Ummite Expeditionaries feed themselves during the trip, but once they arrive on Earth, they can no longer use their UMMO food, so they are forced to eat the food they find on the planet visited. And since molecules are rotated two different ways in the universe, in case they were rotated the other way, there was a specialist in pathology of the digestive system named UORII 19. In chemistry, a compound is called chiral if it is not superimposed on its image in a plane mirror. There are a number of reasons why a molecule can be chiral:

- the presence of one or more asymmetrical centres (except for certain special symmetrical conditions);
- a propeller shape;
- a chirality plan.

If a molecule is chiral, it has at least two so-called enantiomeric forms which are differentiated by an opposite absolute configuration. It is necessary that all the asymmetric elements are opposed between a molecule and its enantiomer. This is called Enantiometry.

When a molecule A is completely equivalent to a molecule B except for the absolute configuration of its asymmetric centers, and A and B are not enantiomers, then A and B are said to be diastereomers of each other. This is Diastereomerism. If molecules A and B, diastereomers of each other, differ only in the absolute configuration of a single asymmetric center, then they are called epimers. Chemical reactions aimed at reversing the absolute configuration of a single asymmetric center are called epimerization. It is epimerism.

Before the modern possibilities of determining the exact structure of a molecule or when the structure has not been determined, that is, when it is not possible to determine the absolute configuration of a molecule, we can still indicate the direction of the optical activity of the compound: + and -, formerly *d* and *l*. A solution rotating the plane of polarization of a beam of counter-clockwise polarized light contains an optical (-) isomer (it is the opposite for an optical (+) isomer). Birefringence is the origin of this phenomenon and is described in detail in the article Rotatory power. This property was first observed by Jean-Baptiste Biot in 1815 and has acquired considerable importance in the sugar industry, analytical chemistry and the pharmaceutical industry.

Louis Pasteur showed in 1848 that optical activity is linked to chirality (Pasteur's criterion).

If chirality is a very present property in the history and the present of organic chemistry which has as its object carbon-based molecules, it is necessary to underline the importance of chirality in the history of coordination chemistry which is interested in metal complexes. It was on the basis of arguments based on chirality that Alfred Werner postulated the importance of octahedral geometry for the very common complexes of transition metals which possess six ligands. To prove their theories, Werner and his collaborators had to isolate enantiomerically pure forms of metal complexes. Furthermore, they also proved that chirality in chemistry was not only associated with carbon by isolating the first enantiomerically pure complex that did not contain any carbon atoms. For this work, Alfred Werner received the Nobel Prize in Chemistry in 1913.

A molecule is chiral when it has no intrinsic symmetry. It can then theoretically appear in two forms, images of each other in a mirror, therefore symmetrical to each other with respect to the plane represented by the mirror. These two forms are not superimposable. They constitute a pair of enantiomers (from the Greek *enantios* "opposite").

Similarly, a shoe is a chiral object because it cannot be superimposed on its mirror image. Its two enantiomers are right shoe and left shoe.

Two enantiomeric molecules have the same physical properties (solubility, boiling temperature, etc.) but different biological properties. They can be differentiated by an optical property, the deviation of polarized light: one of the compounds deflects it to the right and the other to the left. For example, lactic acid exists in two enantiomeric forms: levo-lactic acid and dextro-lactic acid.

The stereogenic centers of a molecule are very generally asymmetric carbon atoms. The distribution of different atoms in space, for example around a point, can lead to non-superimposable situations in a mirror, therefore different objects. In general, the tetravalent carbon can accept 4 different substituents on each of its 4 bonds, which gives rise to two non-superimposable forms in a mirror, enantiomers denominated R and S (from *Rectus* and *Sinister*, right and left in Latin).

Such a carbon atom is usually called an "asymmetric carbon". The presence of such a carbon atom in a molecule makes it chiral. However, there are exceptions to this rule, for molecules containing more than one asymmetric carbon (meso compounds, see below). For example, amino acids (except glycine) are chiral molecules: an amino acid and its mirror image cannot be superimposed because the molecule contains an asymmetric carbon atom (linked to 4 different atoms or groups of atoms). For example, the amino acid alanine has an asymmetric carbon, therefore two enantiomers named R and S, not to be confused with the L or D series (FIGURE 51C).

It should be noted that the concept of asymmetric carbon atom, if it has been used from the historical point of view and is still frequently employed in the teaching of chemistry, does not correspond to the current recommendations of the IUPAC. Indeed, the correct term is central chirality around a carbon atom. The carbon bearing 4 non-identical substituents is a center of chirality.

Chirality is not limited to carbon or other tetravalent atoms:

- octahedral metal complexes and metallocenes can be chiral. The most frequent case is that of complexes comprising three bidentate ligands which gives rise to an environment of the axial chirality type;
- other molecules with a chirality axis such as allenes, biphenyls and spiro compounds;

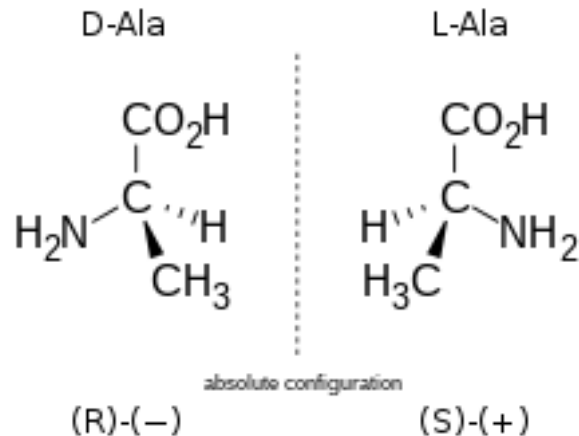


FIGURE 51C: The two enantiomers named R and S

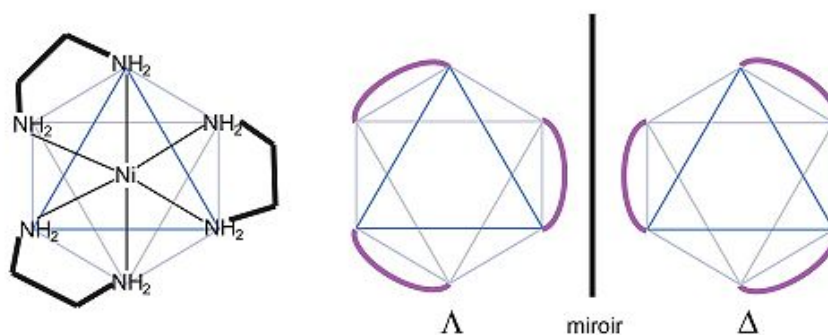


FIGURE 51D: Enantiomers of octahedral metal complexes

- molecules exhibiting helicity such as helicenes (see hexahelicene) and many polymers of biological origin such as proteins and nucleic acids;
- molecules with a chirality plane such as E-cyclooctene, compounds of the ferrocene type whose ring bears two different substituents, etc.

Formally, it is the symmetry of the molecule which determines whether it is chiral or not (it is then called achiral). In practice, a molecule is chiral if and only if it does not have any improper axis of rotation of order  $n$  ( $n$  strictly positive integer), denoted  $S_n$ . It is the rotation of the molecule by  $2\pi/n$  around the axis, followed by a reflection with respect to a plane perpendicular to this axis. An improper axis of rotation of order 1 ( $S_1$ ) is a plane of symmetry (denoted  $\sigma$ ) and an improper axis of rotation of order 2 ( $S_2$ ) is a center of symmetry (denoted  $i$ ).

The enantiomers of octahedral metal complexes possessing three bidentate ligands are denoted  $\Delta$  (delta, right) and  $\Lambda$  (lambda, left) and determined on FIGURE 51D:

The octahedron is arranged on a face which includes one end of each ligand (it is viewed along an axis of symmetry of order 3, the symmetry of the complex is  $D_3$ ), the vertices of the octahedron are distributed over two planes. If a vertex on the upper plane is bound by a ligand to the vertex to its right on the lower plane, the complex is said to be straight or  $\Delta$ . On the other hand, if the lower vertex is to its left, the complex is left or  $\Lambda$ . The enantiomers of allenes, biphenyls and spiro compounds are determined by precise IUPAC rules and are referred to as aR and aS (a=axis), or P (plus) for the right pitch helix and M (minus) for the left pitch respectively (nomenclature of the propellers).

The enantiomers of molecules having a plane of chirality such as E-cyclooctene are denoted pR and pS (p=plane) or M and P respectively.

Today, the "natural" amino acids that make up living beings are all L whereas, when they are synthesized under symmetrical conditions (Miller-Urey experiment for example), a 50/50 mixture of L forms is obtained. and D: it is a racemic mixture. The same goes for sugars: all "natural" (organic) carbohydrates are of the  $D_3$  series. Generally speaking, in living organisms, a single enantiomer has been selected each time the problem has arisen. For example, only the L form of vitamin C is assimilated by the body. We talk about the homochirality of the living. This does not prohibit the participation in life of D-amino acids.

Why and how has life systematically favored one of the two forms? remains an unresolved question. For a beginning of explanation on how the excess of a type of enantiomers of biological molecules was generated, researchers turned to space where the phenomena of radiation can operate on a large scale, and it is the hypothesis of researchers at the Argonne National Laboratory in the United States. Crossing bodies with strong chiral orientation produces polarized light. Strong sources of polarized light having been detected in the Orion Nebula, it is assumed that there are large quantities of enantiomerically pure molecules there.

Two enantiomers possess identical properties in a symmetrical environment. Thus a flat and symmetrical kitchen glove will suit the right or left hand in the same way. On the other hand, a right glove is not suitable for a left hand. In biochemistry, a receptor that is itself chiral can therefore discriminate between two enantiomeric molecules. However, the human being is built with elementary chiral bricks (amino acids, sugars, etc.) and, as far as living organisms are concerned, the consequences of this situation are multiple, depending on the molecule and its biological receptor:

- one enantiomer can be endowed with an interesting biological property, insecticide for example, while the other remains totally inactive. This is the case of deltamethrin;
- two enantiomers can have different properties; for example, the characteristic smell of fennel and dill, which is due to one of the enantiomers of carvone, while the aroma of spearmint is due to the other. Similarly, the two enantiomers of limonene give the aromas of lemon and orange.

These properties can sometimes differ much more dramatically: for example, one can be an effective medicine and the other a poison. This danger was not understood until the 1970s. Previously, for cost reasons, it was natural and common to synthesize drugs in racemic form, assuming that one enantiomer was active and the other was not. had no biological activity. Thalidomide is a classic example of a dramatic failure of this hypothesis: the painkiller was marketed in racemic form, but the supposedly inactive enantiomer was found to cause fetal malformations (teratogenic activity). However, since the two forms can convert into each other in vivo, the teratogenic effect would not have been avoided by administering only one form. Since then, it is mandatory for pharmaceutical

companies to test all stereoisomers that can be generated by the original drug.

The Trans-en-Provence affair refers to the landing of an "object in the shape of a flying saucer" which a mason from Trans-en-Provence (Var), Renato Nicolai, is said to have witnessed on January 8, 1981, as well as the investigations which followed (report by the gendarmerie, GEPAN investigation and INRA analyses). The conclusions of GEPAN (Groupe d'études des phénomènes aérospatiaux non identifiés), according to which the settling and the heating of the ground would be due to a "large-scale event", are contested by the skeptics of the Zetetic Observatory. For them, it is a question of tire tracks, and the affair a hoax of which certain declarations of the witness would be the admission. On January 8, 1981, around 5 p.m., an inhabitant of Trans-en-Provence, Renato Nicolai, retired mason, builds a cement shelter for the water pump of his garden. According to his testimony, he then saw a machine land, with a slight whistling sound but without flames.

Renato Nicolai later states:

"The device had the shape of two plates overturned against each other. It was the color of lead and had a rib around its circumference. Underneath the device, I saw, as it was being lifted, two kinds of round pieces that could be reactors or feet. There were also two other circles that looked like hatches. The two reactors or feet protruded slightly on 20 cm below the device. It was about 1.80 m high and 2.50 m in diameter. Shortly afterwards, the object took off, and soon disappeared in the distance. Between the beginning and the end of the observation it took 30 to 40 seconds.

The object left traces on the ground that the witness showed the next day to his wife, who spoke about it to her neighbor, who, fascinated by UFOs, informed the gendarmerie. The gendarmerie brigade, called on the scene, proceeded to the examination of the traces. In its report, it wrote, about the traces left on the ground: "We note the presence of two concentric circles, one of 2.20 m in diameter, the other of 2.40 m. [...] two diametrically opposed parts of approximately 0.8 m [...] and which present black stripes similar to tire tracks length: 80 cm - width: 10cm".

The report of the gendarmerie also specifies that a different and erroneous description was made by an investigator of XYZ (the report does not specify which group or association it is) claiming that "all traces of vegetation have disappeared", which is incorrect, according to the terms of the report. GEPAN notes that the soil was compacted by a heavy truck, estimated between 4 and 5 tons, that it underwent a thermal heating inferior to 600 °C and that a deposit of iron oxide was left there. Analyses were carried out on the plants and the traces left at the place of the presumed landing, they were carried out by professor Michel Bounias who created the laboratory of Biochemistry of the University of the INRA (INSTITUT NATIONAL DE LA RECHERCHE AGRONOMIQUE) in Avignon.

A contract was signed in 1981 between the CNES (CENTRE NATIONAL D'ETUDE SPATIAL) and the laboratory of Michel Bounias, because the CNES wanted to know if it was possible to highlight a biological impact of unidentified aerospace phenomena and Professor Bounias had answered that under certain conditions it was possible, so a contract was signed between the CNES and the Ministry of Agriculture represented by Bounias. One week after the signature of this contract, an inhabitant of the small town of Trans en Provence saw a machine land in his garden which left a sort of photographic imprint in the ground. Professor Bounias is in charge of analyzing the plants taken around the trace. He made a complete analysis on a series of plants taken on the center of the trace, on the trace itself and at increasingly distant distances. He demonstrated that very often the effects that were observed decreased according to the inverse of the square of the distance, which could make one think of an electromagnetic type phenomenon. He tried to compare these effects produced with those of toxic products, chemicals, heat, different physical sources, and nothing that we know on Earth was likely to produce these effects and explain the observed

phenomenon. In addition, the phenomenon observed in these plants had another peculiarity: the metabolism worked in reverse in these plants, as if when you put your car in first gear, you go in reverse, and as you accelerate you have less consumption. In his conclusion, Bounias states with certainty that there were abnormal biochemical disturbances, applying the criteria of toxicology. The GEPAN report concludes that "It was however possible to show qualitatively the occurrence of a large-scale event that caused mechanical deformations, heating, and perhaps certain contributions of trace materials. On the other hand, on the biochemical level, it does not pronounce on the origin of the strong traumatisms that these plants underwent because it estimates that "the current knowledge on the traumatisms that plants can undergo, remains too fragmentary for one to be able to provide from now on a precise and unique interpretation to this remarkable group of results". GEPAN classified the Trans case as category D (unidentified phenomena).

In 2007, a journalist from L'Express commented on the case in these terms: "The case of Trans-en-Provence (...) remains one of the most famous French cases, not so much because of its scenario as because of the exemplary scientific investigation that it has led to...".

For the Zetetic Observatory, "This new exemplary investigation of GEPAN, by far the most often quoted, turns out to be, however, the one that probably flouts the most its own research methodology". Skeptical about the conclusions of GEPAN, Eric Maillot asks a question which, according to him, sums up the value of the UFO of Trans-en-Provence: "What object placed on the ground, probably emitting pulsed microwaves, can produce a heating of the ground lower than 600°C and not leave any trace of a thermal effect on the plants which grow there?"

Skeptics explain the case by a tire ripping, perhaps due to a concrete mixer used in the masonry work that took place at that time, or to another vehicle.

The earliest debunking (1995) is found in the booklet published by the Society of Investigation and Research on Unidentified Aerospace Phenomena (SERPAN), presided over by Michel Figuet: according to the latter, "tire tracks were used as a pretext to give credibility to the unique testimony of Mr. Nicolaï and to support the belief in UFOs of ET origin".

David Rossoni, Éric Maillot and Éric Déguillaume criticize, for their part, in 2007, the extraterrestrial interpretations of this case and defend, against the opinion of the GEPAN investigators, the scenario of a hoax in their book *Les ovnis du CNES - 30 ans d'études officielles*. According to Éric Maillot, the witness made the following statement at the end of a television program devoted to his observation: "The little word that I wanted to say to finish, it is in... Let us say, I saw, I saw, it is a tale let us say! The proof that one can find on the ground there,...people, scientists there, to raise something, that is another thing. I say me also in the night I dream". And to Michel Figuet, he would have confided: "There are so many idiots in the world. One day, I will tell you the whole truth".

When Michel Bounias died in 2003, this is what Jean-Pierre Petit wrote:

«Who cares? Who talks about it? This death will leave no trace in the big press. Yet this man will have undoubtedly provided one of the most important contributions to the science of our time, and to the history of our planet.

In 1981 a discoidal object landed in broad daylight on a "restanque", in Trans-en-Provence, a small town in the Var. The device jumped a hedge of trees and hit the ground, resting on three feet similar "to cement buckets" according to the only witness of Italian origin, Renato Nicolaï, who observed the object at a distance of about twenty meters, sheltered behind a small wall.

Then the machine takes off again and disappears. Nicolaï does not address either the gendarmerie, or the GEPAN. But his wife chatted and it is finally a gendarme who takes his testimony, in spite of his reticence (he is afraid to be considered as a madman). This one, very appropriately, collects simple alfalfa plants inside a trace of one and a half meter in diameter and outside. He has the

good idea to collect the earthy support. All this is sent to GEPAN in Toulouse, which is then directed by the polytechnician Alain Esterle succeeding the engineer Claude Poher. These samples were taken on the initiative of the gendarme and did not correspond to the "directives issued by GEPAN" which had decided to be interested in traces on the ground only:

- If there were several witnesses
- If it had not rained

Now there is a single witness and the landing site has undergone a large rinsing between the event itself and the taking of samples. These arrive in Toulouse and it will take three weeks before they land on the bench of Michel Bounias, Director of Research at the INRA of Avignon (Research Institute in Agronomy). His skills put him in a particularly favorable position to analyze the traumas suffered by plants since he had done his thesis at the CEA, focusing on the alterations suffered by plants under the effect of ionizing radiation.

Very quickly Bounias, able to carry out his analyses on the smallest fragments, detected very important anomalies concerning the "pigmentary equipment of plants" (chlorophylls A and B, carotene, pheophytin, violaxanthin, etc.). He asks for a systematic analysis with samples taken every meter, specifies that the information contained in the samples can be frozen (literally and figuratively) by keeping them in liquid carbon dioxide. The analysis highlights an extraordinary phenomenon-distance correlation (I will complete this file later. It is a first draft, quick). As Aimé Michel and Pierre Guérin pointed out at the time: "Scientific ufology was born that day".

What is extraordinary is that these biological traces are not only very clear, but also durable. Bounias will carry out a follow-up of the site from far and wide, showing that the return to normal will take place in 18 months! He has thus created a fantastic "UFO trap" which only asks to function. An obscure ufologist, Michel Figuet, night watchman, puts forward a personal hypothesis. These alterations would be due to cement projections and the circular traces, evoking a shifting, would have been linked to the movement of Nicolai's cement mixer. Brilliant "ufological" contribution.

Annoyed, Bounias will nevertheless make verifications, negative. Cement has no effect on the pigmentary equipment of plants. To this day, nothing known, apart from the radiation of a megarad, could cause such alterations. One year later, the case of the "Amaranth" occurred. A UFO parked under the eyes of a researcher of the CNRS, in his small garden. The plants which are there, "Amaranths" are affected to the point that the trauma is visible to the naked eye.

- Bounias is not solicited to make himself the collection and the analysis of the samples
- Gendarmes take care of it who "do not preserve the plants in their earthy support, but cut the stems and put the collected samples in plastic bags" where... they rot.
- It is in an advanced state of decomposition that they will arrive in a university biology lab in Toulouse, which will not be able to extract anything from them.

What happened? Have the people of GEPAN, although given very explicit instructions by Bounias, who was totally out of the loop, all become idiots? Of course not. But, immediately with this breakthrough of Trans the ETCA (Etablissement Technique Centrale de l'Armement), laboratory of analyses, military, created without difficulty a copy of the modest laboratory of Bounias and it is there that landed the correctly taken samples, while these plants, sectioned, cooked, will constitute a phony analysis "of which, alas, one will have been able to draw nothing".

There have been other Trans-en-Provinces but this time the system, well locked, worked without anyone seeing the samples. Remember: the gendarmes, these "brave pandores", are above all military men, bound to secrecy. At the same time, and this is where it gets ugly, Bounias will be plagued by difficulties, by the aggressiveness of the INRA management. But the Army did not care. It got what it wanted. The "capture of know-how" was carried out in a satisfactory way. The



author of the analysis method, the one who hit the jackpot, can now go fuck himself. It is even desirable that these difficulties discourage him from pursuing research in this field. Everything is done to make him sick.

The capture of know-how continues. Shortly after Trans en Provence, Bounias and I ask to go before the scientific council of GEPAN to propose a simulation. It would be a question of subjecting alfalfa-witnesses to microwaves pulsed in 3 gigahertz, pulsed in low frequency. Size of the waveguide: 5 mm by 5 mm. A "table manipulation" with a modest source that a laboratory like Thourel's, the DERMO (department of study and research on microwaves, linked to GEPAN) could have lent. But, detail, these microwaves do not exist in nature. They are... radar waves. If Bounias had been able to reconstitute the alterations, for which no other cause could be found, "the cat would be out of the bag" which was not desired in high places. In parallel I had suggested that waves of this kind, modulated in audible frequencies, be directed on rats having undergone a Pavlovian conditioning, to verify (what we know pertinently today) that the organs of the brain can be sensitive to this effector without the eardrums moving. The Cnes eludes our proposals "because, not being from the house, we cannot floor in front of the Gegan Council".

Well, let's see....

But the ETCA takes good note and mounts the manips. A single echo, by an indiscretion of Velasco and collected by myself, during a visit to Toulouse: "the system of defoliation by microwaves works very well...". At the same time, Esterle and Zappoli, at CERT (Centre d'Etudes et de Recherche de Toulouse, closely linked to the army, to which DERMO belongs), set up the manip-catastrophe "based on my ideas", which failed, due to a costly accumulation of nonsense linked to the incompetence of the two will lead to the dissolution of GEPAN and the dismissal of the two, on the recommendation of René Pellat (current High Commissioner for Atomic Energy, at the time a member of the Scientific Council of Gegan). I will present a complete file on this manipulation when I have a moment. I have all the elements, the letters, the photos, the damning evidence. This failure foreshadows the setbacks that await the brilliant MHD team that is currently being set up in France.

Twenty years later these elements will constitute the pieces of the COMETA file given to the President of the Republic (Chirac) and to the Prime Minister (Jospin) with a plan for the development of research (to reinforce... the SEPRA!).

Thank you Hubert Curien, thank you Alain Esterle, thank you René Pellat, Thank you Jean-Jacques Vélasco. Thanks to the Army, to the ETCA, to the DG and, of course, to the conductor of this fantastic mismanagement: Gilbert Payan.

I hear people saying "Petit is settling scores, bringing up stories from thirty years ago. He periodically freaks out. He is "a man of difficult character". Wouldn't it be better to turn to positive things?" What are they? Reinforce the SEPRA, water the COMETA? applaud the setting up of this "French MHD project" (see Air et Cosmos of April 18, 2003).

Haven't you had enough of being taken for fools for 28 years? Can you remain indifferent when UFO sites are infiltrated at the highest level by people working for the intelligence services? When forums contain people who have been working for the secret services for a long time? But what do you believe? That the UFO dossier is part of the "magazine" side of the news? That it belongs to this "science" called "ufology", generated by "eminent ufologists" who perorate all day long on subjects of which they know nothing.

Usque tandem, Catilina, abuserat patientia nostra ?

But, it is well known, J.P.PETIT is "intolerant", even... paranoid.

Continue to be deceived, infiltrated by people who pretend to be dedicated people, even humanists. Do you think a good spy has a spy's face? That said, some people lose their cool sometimes. Then the lips curl up and the "good fat cat" shows some nice sized canines. Sometimes threats worthy of thugs are uttered. If you knew the number of "moles" I have seen in 28 years, you would not believe your ears. Are you trying to identify them? Look at former military personnel or people who "used to work for the secret services" or "know these people well". Or else sleep on your two ears, remain blind, deaf.

But maybe you will think that COMETA is a "civilian organization"? Of course, it is a simple association under the law of 1901. Perhaps you will think that "the army is not so bad as that, that one should not make primary antimilitarism".

One day, I will die, too. Things are so blocked that it is possible that when I pass away, after Aimé Michel, Pierre Guerin and Michel Bounias, the ufological scene will still be occupied by the same sad clowns and parasitized by the same envoys of the "services". My books will end up in attics. On Earth, what will happen will happen. Anything, as usual.

Michel Bounias must have been buried somewhere. Soon, how many will still remember the name of this courageous earthling who never turned his back, resisted all pressures and who, one day, made the first "UFO trap" work, perhaps in the history of the world.

When I put on my site this file dedicated to the memory of the late Michel Bounias several readers drew my attention to a commentary of his work which had been made by Eric Maillot in a site <http://www.zetetique.ldh.org/tep.html>. So I went to consult this document, about which I would like to make some comments.

The reader may be surprised to see that I will not focus on the technical aspects of the criticisms made. In any case, when one reads Maillot's text, the intention is clear: to demolish the work of Michel Bounias by all means. This is the mission that he gives through his writings, which make him a debunker (in English, to debunk means "to take down"). The function of the debunker consists in demolishing files, and mainly UFO files; here the famous case of Trans-en-Provence.

In examining this text I would like to emphasize the psychology and motivation of the debunker. Such characters have existed as soon as the UFO phenomenon appeared. Initially, it was scientists who took up the cause. The most famous in this regard was undoubtedly Philip Klass, who was, I believe, editor-in-chief of the magazine *Scientific American*. To deflate any UFO affair, for him, everything was good. Many witnesses who had observed objects with a large apparent diameter, by perceiving details, were invariably retorted:

- You have observed Venus...

One day Klass replied to an airline pilot who told of his observation of several objects flying around in front of his plane:

- You observed fireflies that had slipped through the double glass of your cockpit.  
leaving the unfortunate observer stunned.

An academician, an astrophysicist, at the time when he was president of the Rationalist Union, an association whose mission was to fight against all false sciences, played a very active role as a debunker in the seventies. At that time no scientist of value had taken up the cause of the HET (hypothesis advocating the extraterrestrial origin of the UFO). He went from town to town throughout France, developing an argument that seemed to him to be without appeal. As many witnesses reported evolutions which, if they referred to those of material objects, implied supersonic or even hypersonic speeds, he replied curtly that in this case the witness should have perceived the "Bang" linked to such an evolution. It took the appearance of my theory of MHD propulsion for this argument to lose weight. Currently France is trying to set up an "MHD project". It mentions

MHD systems allowing to operate "a reduction of the wave drag" field in which "the Russians would have played a role of pioneers". The total suppression of the shock waves is not yet evoked, but that will not be long.

Our academician was put in checkmate in 1976 after taking too imprudent positions. Confronted with my model of discoidal MHD aerodyne, he declared during the assizes of the Rationalist Union in Grenoble that same year "that it was impossible for a flying machine to ensure its sustentation by producing itself its own magnetic field and its own electric field". He even added on this point "that there were theorems that opposed it" and compared it derisively to a story told by the famous Baron of Munchausen, the German Tartarin, who claimed, while sitting on his mare which had gotten stuck in a swamp, to have pulled her out of trouble by pulling... on her mane.

In doing so, the astrophysicist was simply mistaken ... of MHD. Let's take the opportunity to clarify this point. Why two MHDs?

In the MHD, an ionized gas, conductor of electricity, an electric current associated with a current density  $J$ , in amperes per square meter and a magnetic field  $B$  are combined. From these data, in particular from the value  $s$  of the electrical conductivity, we can calculate a magnetic Reynolds number:  $R_m = \mu_0 s_0 V_0 L_0$ . If  $R_m$  is elevated the magnetic field will be strongly bound to the "plasma". This is the case, for example, with solar flares where the lines of force of the solar magnetic field are closely linked to the plasma bursts emitted by the star of the day (in English we use the expression "frozen in", in other words "frozen in"). This world of plasmas with large numbers of magnetic Reynolds is therefore that of astrophysicists and it is in this precise case that the theorems invoked by the astrophysicist Schatzman apply. It is also on this "MHD" that the reader will fall after he has carried out a search on the Internet where he will be surprised to find many articles "dedicated to the MHD".

When the Reynolds number is low or simply moderate things change completely. Take a basin of water that you have made conductive electricity by adding a handful of salt. Move a magnet just above the water so that its field lines are perpendicular to its surface. It will not be hot or cold, because the local value of the Reynolds number is low. With a high value the magnet would carry the fluid with it.

Our academician had taken his feet in his theorems and this distingo, which is sometimes not yet well perceived, can lead scientists to utter new nonsense.

End of this parenthesis evoking an episode where a heavy duty physicist came to reinforce the supporters of the HET, hitherto easily undermined by the Ayathollah of science.

As there was now a certain risk of pronouncing too peremptorily the scientific fundamentalists became more cautious and more measured in their remarks.

Surprisingly, the debunking task was now carried out by ... ufologists. You have an example in the person of Michel Figuet, quoted in the article of Maillot. What does it read? Confronted with this analysis carried out by Professor Michel Bounias "the ufologist" Figuet immediately constructed a counter-theory. He imagines that the traces highlighted on the site and which have been the subject of quite thorough analyses by the GEPAN (see note GEPAN n°16 of 1981) could have been created by a simple ... concrete mixer, ripting on the ground. Maillot asks with insistence why we did not take into consideration the fact that the traces visible on the pictures cannot be tire tracks. And Figuet perfecting all this by suggesting that the biological alterations highlighted by Bounias could be attributed "to cement projection". Although the researcher at the INRA in Avignon had said that it was impossible to modify the pigment equipment of the plants in this way, Figuet persisted in evoking "his hypothesis", which compelled Bounias, frustrated, to make a counter-study by spraying alfalfa with cement and redoing all measurements in the laboratory.

We could say that it is healthy for different opinions to be expressed. But it is the way they are worded that causes concern. When you read Maillot's article you see that he gives the floor to a "professor A" who criticizes the work of Bounias, while having strongly insisted on maintaining a cautious anonymity. That doesn't sound very serious.

Then examine the tone adopted by Maillot in his text. He writes several times "during this time Bounias shows himself on television". I personally have been on television 25 or 30 times, and I'm not warm or cold. I can't say to myself that I like it very much because in general I am invited only in "magazine" shows where you have to play the game of entertainers, which is not always the most pleasant. Do not imagine that French television will one day organize a real debate between scientists on the UFO theme. To inform, you have to agree to be on these "mainstream" programs. It's either that or nothing.

Then consider the "profit" taken away by the scientists who have agreed to commit themselves in this way. I may have sold a few books, but on the other hand, this commitment meant a complete scuttling of my career and endless trouble. I had to face a witch hunt for more than a quarter of a century where very few would have survived the way I did. I had to deal with I don't know how many more violent plots and attacks. The corridors of the CNRS have the look of a punch, very often.

The same goes for a Bounias, whose fools will only remember what feeds their dreams: the passages on the small screen, for them "sublime consecration". They forget the repression, the infamous war of nerves of which man was immediately the object from his hierarchy of the INRA. His collaborators, his equipment, his premises were taken away from him, at the very moment when, in complete discretion, the Army was cloning its laboratory in its ETCA (Central Weapons Technical Establishment) sanctuaries, without the slightest complexity. In France repression and looting are by no means incompatible when the reason of state covers everything.

What do you think happened. Somewhere "high up" someone probably said:

- It might be a good idea for Bounias not to be able to conduct such research outside our control.
- Don't worry. His hierarchy is making him taste the bread.
- Oh, very good. That's better.

While Bounias gradually saw himself deprived of his means of research ufologists criticized his courageous and meritorious work. In hindsight, knowing exactly what was going on, I am shocked by this pathetic meanness of mediocre people. This pseudo-discipline, called ufology itself, is full of people with no real skills.

What I can assure you is that all these ufologists who shoot red balls at these scientists who commit themselves and expose themselves would kill mother and father to go strutting around in front of the cameras. From the mid-1970s onwards, scientists have somehow stolen the spotlight from them. Before, when it came to UFOs, they called "ufologists" who could play "experts in ufology", and they did not deprive themselves of it.

I personally kept, which I rarely do, a recording of a television show on La Cinq, hosted by Berkoff, from 1992, where Benveniste and I had to deal with scientists (Jean-Claude Ribes, at the time director of the Lyon observatory, Jean-Louis Heudier, astronomer at the Nice observatory), but above all to a pack of very aggressive ufologists, who had to be silenced one by one, simply by highlighting their level of competence. It was not very pleasant, but what to do when you are approached by night guards, by people who just have a certificate of studies and who take tones of experts.

Why did these ufologists take over from the fundamentalists of science by now providing debunking? Because it has become for them the only way to spread their ego in public, otherwise these people

would sink back into .. the most complete anonymity, having in fact nothing to say in particular, no idea to defend.

When you run out of ideas, all you have to do is go after the ideas of others.

Science begins where vanity and aggression end.

In the mid-1990s I was the object of a very violent attack by a Belgian academic, "grey eminence" of the SOBEPS (Belgian Society for the Study of Space Phenomena).

In a special issue of the journal, this physics professor at the University of Louvain engaged in what he believed was a complete demolition of my cosmological work, all the more disturbing as they found their starting point in ... the Ummo file. My answer was posted on the Internet a few days later via Thierry Wathelet. I showed that this physicist had not understood my work and had even put words in my mouth that I had never said and never written in any of my books. The response in return was severe.

I'm not settling scores. It's been done for many years. I merely illustrate a phenomenon perfectly described by the psychologist René Girard in his book "The Ancient Road of Perverse Men" and entitled "Desire and Hatred". For Girard one of the most powerful mechanisms in human beings is to envy the leaders, those who are "in sight". According to Girard, the corollary of this desire is a violent aggression which, in the case of this academic, was expressed suddenly. But this duality "desire (to find oneself in the place of the one who is the object) - hatred" you will find it everywhere. All you have to do is buy Ici-Paris. Every week its editor takes stock:

"So what celebrity has cancer? Have you been to clinics, hospitals?" What human drama could we throw at the man on the street this week?

In front of him, elements used to compose a catchy title like:

Something: it seems that it would be more serious than we say.

Tip: Emergency hospital in the middle of the Union des artistes gala.

The "little people" read the newspaper and Monsieur Bidochon said to his wife:

"You see, Machin. He had reached the heights of glory. He could afford all the women he wanted."

Well, here he is hospitalized with cancer, poor guy.

The couple Bidochon saliva of pleasure, and Madame Bidochon to add:

"You see. No matter how high they are, they end up like us."

I reread Eric Maillot's text. But who is this man? What are his skills? What ideas does he defend? What contribution can he claim? You get the impression that this man is saying, "I have nothing special to say. I have no ideas, and I have never had any. So, to exist, I position myself as a demolisher of works".

You are lucky, Mr. Maillot, that Michel Bounias is dead, otherwise he would have nailed you and your "Professor A", who is so courageously hiding behind his anonymity. Why don't you take it out on me? I've got a "storehouse" and a pretty loose tongue. A little courage, risk it. Do like this other ufologist debunker in his time: Gildas Bourdais who, in his time, deplors that scientists have invaded the UFO scene.

9 March 2004: The press reports that people accuse insecticides of killing bees. These are the main pollinators. If we kill the bees, we can die, and we're stupid enough and greedy enough to do that. I remember 25 years ago a certain Michel Bounias, from the Institut National de la Recherche Agronomique d'Avignon, published a lot of papers on bee toxicology. One of the first, if not the first, he had issued this warning: "beware of bees!". At the time, he was hardly listened to. Later on, Rémy Chauvin drew people's attention to the fact that toxicity to bees could be one of the fallout from ... GMO, where we play the sorcerer's apprentice.»

The object of Trans-en provence is too small to be inhabited, so if it is indeed of extraterrestrial



FIGURE 51E: The two arcs of the supposed landing of Trans-en provence with Michel Bounias interviewed by Jimmy Guieu.

origin, it is a flying saucer sent for observation on Earth, and the Ummites say that they too were visited by objects in the shape of flying saucers without passengers inside before making official contact, they were objects sent for reconnaissance, the travel technology between the stars is risky so first they send reconnaissance saucers, without passengers inside.

Except in science fiction movies, it is established as a marble table of the laws of nature that time can only flow in one direction: from the past to the future. Well, this certainty has just been shaken by an international team of physicists who have discovered that, under particular conditions, time can flow backwards. Let's try to understand how and why.

Since time immemorial, time has been an enigma for man. Quid est tempus? What is time?" asked Saint Augustine. And he answered in his Confessions: "When no one asks me, I know. If someone asks me about it, I propose to explain, and I don't know anymore. Saint Augustine was right. We all talk about time, we all talk about hours, past time, future time. And everyone understands. Yet, when you think about it, nothing is more obscure. Our only certainty is that the arrow of time has only one direction. It always goes from the past to the future. We remember what happened yesterday; we cannot remember what happened tomorrow.

Scientists admit this certainty, but do not understand why a cause should necessarily come before its effect. The more we go down to the level of matter, the more this question deserves to be asked.

Entropy or nothing

Physicists bring elements of answer to define time by concentrating on a major characteristic, the movement of energy. They thus refer to entropy. In a system like the universe, which cannot receive external energy, the physical elements necessarily pass from an ordered state to a disordered state.

From order to chaos. If we want to understand the phenomenon on our scale, it is like saying that a glass of hot water placed in a cold room will never get warm. It will only get colder. This is one of the laws of thermodynamics. Like time, this reality cannot be reversed.

Even at the quantum level, the particles behave according to the initial conditions of departure. They always go in one direction, forward.

This functioning seems to be established as irreversible. But today, a flaw has been introduced in this certainty. Researchers have established, on a very small scale, that this arrow can be reversed and that time can be turned back. Basically, the glass of hot water got hotter and hotter, even in a cold environment.

The hidden mysteries of chloroform

An international team of researchers from Germany, Singapore, New York, England, etc., have just published an article on the specialized site arXiv.org. This publication (see the study in pdf) is currently being validated to pass the tests for publication in major scientific journals. We must therefore be cautious about the validity of the results. However, this study arouses a huge interest because, if it were true, it would be a revolution in physics, with applications that we would not dare to imagine today. Going back in time is man's dream and perhaps the key to space travel.

Scientists had an original idea. They undertook to examine a very well-known product: chloroform. This molecule is composed of a carbon atom, linked to a hydrogen atom and three chlorine atoms. They used a strong magnetic field to align the carbon and hydrogen atoms, which they suspended in acetone. They then used nuclear magnetic resonance to slowly heat the atoms' nuclei. And they observed what happened.

Professor Michel Bounias without knowing it has undoubtedly observed the effects of time inversion on plant species. These effects were brought about by the electromagnetic fields used for mass inversion and vertical lift-off based on antigravity used by the autonomous spacecraft.

The Trans-en-Provence affair is one of the best known in France, but UFO sightings date back to the times of the Romans who saw shields flying in the sky in the time of Cicero.

The term "flying saucer" was born in 1947.

An unidentified flying object, generally referred to by the acronym UFO, is an aerial phenomenon that witnesses claim to have observed or which has been recorded by sensors (video camera, photographic device, radar, etc.) without having been able to be identified but whose exact origin or nature is unknown and which, for some, remain unexplained even after thorough investigation. The acronym UFO (unidentified flying object) provides the root of the word "ufologist", person studying the UFO phenomenon. The resulting discipline is ufology. The saucerist is an amateur who believes in the UFO phenomenon, as opposed to ufologists who defend a scientific and rigorous approach. UFOs are sometimes referred to by the acronym MOC, "mysterious celestial object".

According to astronomer J. Allen Hynek, tens of thousands of testimonies have been collected around the world.

In popular culture, the term UFO is generally used to refer to a spacecraft inhabited by extraterrestrials, and called a flying saucer.

The first modern sightings of unidentified aircraft date from the Second World War: pilots observed ghost fighters (foo fighters, "ghost hunters", or kraut-bolids, "boches bolides").

In 1946, the media reported more than 2,000 testimonies of unidentified aircraft mainly in Scandinavian countries, but also in France, Portugal, Italy and Greece. These aircraft are called phantom rockets because people believe that these mysterious objects emanate from the Peenem nde Army Research Center and are Russian tests of new prototype V1 or V2 rockets taken from the Germans for the purpose to intimidate Western Europe.

But these names were quickly dethroned by that of flying saucers following the publicized testimony of an American businessman, Kenneth Arnold, who mobilized the attention of the world press in 1947.

Kenneth Arnold's sighting

Report by Kenneth Arnold sent to United States Army Air Forces on July 12, 1947, with sketches of the flat pebble shaped objects. On June 26, 1947, Kenneth Arnold, an American pilot, recounts on KWRC (a radio station in Pendleton, Oregon) the observation he made forty-eight hours earlier while flying in his plane. private near Mount Rainier, Washington. He reports having seen on June 24, without being able to identify them, nine objects in the form of flat pebbles, very bright and very fast, flying in the direction of Mount Adams from Mount Rainier. He estimates their length at between twelve and fifteen meters and their speed at at least 1,800 km/h. They flew, says Arnold, "like geese, forming a diagonal chain as if tethered to each other, in a hopping motion, like a saucer ricocheting across water."

Although Arnold spoke of a saucer to describe the movements of these unidentified objects and not their shape, the press will relate that they resembled "flying saucers" (flying saucers), a term which will remain definitively associated with UFOs. Another comparison to a "pie plate" (pie-plate) cut in the middle with a convex triangle on the back will also earn it the laughing stock of the media and the public.

On June 25, 1947, a dispatch from the Associated Press written by Bill Bequette will have a considerable influence on the sequence of events because the estimation of distances and therefore of speeds (Arnold calculates the speed by estimating the plumbness of objects and the distance that they travel but measures the time necessary to pass from one estimated point to another) seems superior to that of the machines of the time.

This first appearance of UFO had a considerable repercussion and saw moving on the spot not only a crowd of curious people but also journalists, agents of the FBI and military intelligence. According to sociologist Pierre Lagrange, it was under these circumstances that flying saucers were invented. The Arnold case triggered a considerable parascientific controversy to such an extent that one will suspect the existence of secret prototypes, American or Russian, or that extraterrestrials visit the Earth.

Consequences and rapid increase in the number of testimonies After the publication of Arnold's testimony, many other witnesses became known,<sup>14</sup> and the debate quickly crossed the borders of the United States.

A pilot, Richard Rankin, reports observing a strange craft a few days before Arnold. He said he didn't mention it because he thought it was a Navy aircraft, the Flying Flapjack. On July 4, a United Airlines crew reported observing nine disk-shaped objects that escorted their aircraft over Idaho on the evening of July 4, 1947. This testimony seems more credible to the media than Arnold's. The following days, most newspapers tell stories about flying saucers on the front page. Dozens of other observations are reported. Some stories evoke falling flying saucers, but these stories are quickly classified as hoaxes and misinterpretation. Thus, on July 4, the Roswell base in New Mexico announced the recovery of a flying disc, but a few hours later, a new statement from the army explained that it was in fact the debris of a balloon. This story, like dozens of others during the summer of 1947, triggers a brief interest before being forgotten and chased away by the following stories. Today, the Roswell affair is known to a large part of the public, not because of the brief news it generated in 1947 but because of a book published in 1980 by writer Charles Berlitz and ufologist William Moore, *The Roswell Incident*. A friend of Moore's, ufologist Stanton Friedman, had met (after a radio broadcast) one of the soldiers who had recovered the



debris and who had refused for thirty years the explanation by a balloon given by the army in 1947. The Roswell Incident unearthed this forgotten history and gradually, and especially after the US Congress asked the US Air Force for explanations in 1994, Roswell became the most popular UFO story. Television series like X-Files take over, a TV film is even devoted to this one case, etc.

On 4 July 1947, Mac Brazel, owner of a ranch near Roswell, discovered debris on his land and warned the nearest military base. A young member of the Roswell Army Air Field (RAAF) issued a first press release announcing that the army had discovered a “flying saucer” crashed near a ranch in Roswell, generating a high level of media interest. Kenneth Arnold’s observation had taken place nine days earlier and had been widely reported in the press, so that flying saucers were present in all minds, including the military. The following day, the general command of the base issued a corrigendum announcing that the flying saucer was only a sounding balloon. A press conference was held in the aftermath, revealing to journalists debris from the recovered object and confirming the balloon-probe’s thesis. The case then fell into oblivion for about thirty years, marking the end of the first major wave of UFOs in the United States.

In 1978, Major Jesse Marcel, who took part in the recovery of the debris at Roswell in 1947, declared on television that it was surely of extraterrestrial origin and that the debris that General Ramey (in charge of the base) showed journalists are not the ones that Marcel brought him from Roswell that were according to him in unidentified metal and included for some characters of an unknown writing. He expresses his belief that the military had actually hidden the discovery of a space vehicle from ufologist Stanton T. Friedman. His story circulates among UFO lovers and in ufology journals. In February 1980, the National Enquirer conducted its own interview with Major Marcel, which triggered the re-media coverage of the Roswell incident. Other witnesses and reports come out of the shadows over time, adding new details to the story. For example, a major military operation was carried out at the time, aimed at finding pieces of wreckage, or aliens, on no fewer than 11 sites, or testimonies of intimidation on witnesses. In 1989, a retired funeral director, Glenn Dennis, said that autopsies of aliens had been performed at the Roswell base. In 1991, General Du Bose, Chief of Staff to General Ramey in 1947, confirmed that General Ramey had replaced the debris transmitted by the Roswell base with a weather balloon, shown to journalists. In response to these new elements, and following an investigation by the United States Congress, the GAO (Government Accountability Office, a Congressional-owned oversight organization) asked the United States Air Force to conduct an internal investigation. The results of this survey are summarized in two reports. The first, published in 1995, concluded that the debris found in 1947 came from a secret government program called the Mogul Project. The second, published in 1997, concluded that the evidence concerning the recovery of alien corpses was likely the result of circumstantial reports of military accidents involving wounded and dead, or the recovery of anthropomorphic models during military programs such as Operation High Dive, conducted around the 1950s. This report nevertheless indicates that the debate on what really fell at Roswell continues, while specifying that all administrative documents of the base for the period March 1945-December 1949 were destroyed as well as all radio messages sent by the base from October 1946 to February 1949. The destruction slip does not mention when, by whom, and on whose order this destruction was carried out. These reports were rejected by the proponents of the extraterrestrial theory, shouting at misinformation, although a significant number of ufologists then agree on a decrease in the probability that an extraterrestrial space vehicle is really involved. The attitude of the American authorities At the official level, the problem of UFOs was the subject of some controversy within military offices until the closure of the investigation program in 1969. According to Pierre Lagrange, the attitude of experts who display in public certainties to calm people’s minds, as well as the publication of the

works of Donald Keyhoe and Frank Scully, “contribute to the idea that the Powerful know more than the public.”

Former President Barack Obama said on May 17, 2021 on CBS that there are images and videos of objects that the United States is unable to identify or explain some of their maneuvers.

The Pentagon acknowledged in a report released on June 25 of the same year that the UAPs pose a national security problem and that more detailed analyses are needed. In the middle of the Cold War, worried that the recent UFOs could be secret Soviet prototypes (the government thought it was dealing with unidentified flying weapons, not alien space vehicles), the American General Staff decides to investigate this phenomenon. In US airspace, different procedures for the collection and transmission of observations are integrated into generalist devices and in particular on observations of unidentified objects. The main procedure put in place is called CIRVIS, but in October 1947, General Schulgen, Chief of Air Staff Intelligence at the Pentagon, activates the transmission of information about UFOs abroad and orders to keep it secret under penalty of violating the laws of espionage. The system goes beyond the army: a directive JANAP 146 obliges the soldiers, but also the captains of the civil aviation and the merchant navy, to report their observations of UFOs urgently to certain authorities, who themselves must account for it, including Air Operational Command (now NORAD) in Colorado Springs. This extension provoked protests, especially among the civilian pilots who launched a petition in 1958. In 1959, Canada adopted the CIRVIS, which covered the entire North American continent.

All foreign press is meticulously analysed (even French, national and local newspapers). But the information is not detailed enough and needs to be deepened. When *Paris Match* published an article on an observation near Orly airport, on the night of February 18 to 19, 1956<sup>31</sup>, the new deputy director of scientific intelligence of the CIA denigrates the French press while France’s interest in UFOs is closely monitored. When the subject made the headlines of the national daily press for the first time in June 1952, the news immediately reached the United States via an intelligence report.

In 1949, an FBI memorandum to its director, John Edgar Hoover, informed him that “At recent weekly intelligence meetings between the G-2 (Army Intelligence), ONI (Naval Intelligence), OSI (Air Force Special Investigations Office) and the FBI, in 4th Army quarters, G-G officers<sup>2</sup> of the 4th Army discussed the issue of “flying discs”, “flying saucers” and “fireballs”. This subject is considered top secret (Secret Defense) by the intelligence officers of the Army and the Air Forces». For example, the release in 1979 of a letter from Air Force General Carroll H. Bolender announcing the imminent end of the Blue Book project, will not end military reports on UFOs that may affect national security because these secret Defence reports are not part of the Blue Book system.

This doctrine was developed in the post-war period by the National Security Council (Directives NSC 4/4A, 4 December 1947; NSC 10/2, 18 June 1948; NSC 68, 14 April 1950) and the Psychological Strategy Board (PSB).), created on 4 April 1951 to fight against «communist influence» and then against UFOs. In 1952, Walter Smith, director of the CIA, informed the office of psychological strategy that he was forwarding to the National Security Council a proposal for a directive concluding that the problems related to unidentified flying objects appear to have implications in terms of psychological warfare for both intelligence and operations and proposes to discuss the possible offensive or defensive uses of these phenomena for purposes of psychological warfare» (Memorandum from Walter Smith to the Director of the Office of Psychological Strategy, 28 September 1952) while aerial intrusions of UFOs near nuclear facilities and on atomic missile sites were publicly considered of no interest during the Cold War (FBI documents for the post-war period, such as “Protection of Vital Facilities” and Ministry of Defence documents for the 1970s, are available).

Historical documents Twining's letter to General Schulgen In September 1947, Brigadier-General Schulgen of the Pentagon asked the director of the CMA (Air Materiel Command), Lieutenant-General Nathan Twining, what he thought of the saucers. On September 23, 1947, the latter responded to General Schulgen by evoking the possibility that flying discs could be American machines in the context of «some highly confidential unknown project». It also contemplates the possibility that these devices could be sent by a foreign nation that has developed "a type of propulsion that is undoubtedly nuclear, which is outside our current knowledge". Nathan Twining points out the lack of evidence, such as debris from crushed saucers, that could attest to the existence of these objects.

#### The Sign Project

In the memorandum of 27 April 1949 sent to the press, the Sign project announced that saucers are not a threat to the security of States and are not devices coming from another planet. The insurance posted hides dithering about the assumptions being considered. The extraterrestrial hypothesis was for a time: Sign's experts are writing a draft report entitled "Estimate of the Situation" which supports this hypothesis. The draft report will be rejected by the hierarchy, destroyed and staff dismissed.

#### Air Intelligence Division Study 203

Discovered by ufologist Robert Todd at the National Archives in 1985, the Air Intelligence Division Study 203 considers only two hypotheses: those of Russian planes and that of American planes. Of these, Northrop-type flying wings are the nominees.

#### AIDS 203

highlights the lack or lack of cooperation between government agencies, "it is imperative that all other agencies cooperate in confirming or denying the possibility that these objects may have a domestic origin."

Archives released by the US Air Force In 1985, the US Air Force stopped its work on UFOs, considering that no UFOs reported, having been investigated and evaluated by the US Air Force, has never given any indication of a threat to our national security [and that] there has been no indication that visions classified as 'unidentified' correspond to alien vehicles." Following the publication of 130,000 pages of deconfidentialized archives on the BlackVault database, thousands of UFO visions around the world between 1947 and 1969 are now available on the Internet.

#### Data analysis (UFO cases solved)

Most UFO sightings find after investigation a simple explanation.

In January 1948, the incident in Mantell, Kentucky, related the death of Captain Thomas F. Mantell following the collision with a sounding balloon. The official investigation concluded that the latter had lost consciousness following a failure of its oxygen supply at the altitude of 7,500 meters, that the pilots of the squadron and the many witnesses had confused the planet Venus (actually visible in broad daylight at this time) with a UFO, that he had hit a Navy Skyhook balloon dropped at Clinton, Ohio, and that the aircraft had then descended to the point of impact.

In July 1952, the Blue Book project explained to the press that the origin of the Washington Musical Ride was a temperature inversion in the sky caused by the conflict between a layer of hot air caught in a pincer between two layers of colder air. This would have had the effect of causing a mirage effect, by reflecting radar waves and refracting light rays from the ground. Radar specialists explain that this phenomenon is the cause of false radar echoes. This explanation is contested by some ufologists.

In September 1976, during what would later be known as the Tehran incident, an Iranian air base was attacked by calls pointing to strange lights. Despite the lack of radar detection (according to

Jacques Brucker) the general commanding the base decided to launch fighters to intercept these «strange lights». Philip J. Klass explained this case by the inexperience of the pilots and their confusion with the planet Jupiter to the maximum that evening. A meteorite crossing the sky shortly afterwards was mistaken for a device from elsewhere.

In Nort-sur-Erdre, in September 1987, a teenager claimed to have recorded a UFO sound. The analysis of the sound showed that it was a Soviet trans-horizon radar, well known to radio amateurs. On September 29, 1988, a mechanic driving on the A1 motorway between Paris and Lille saw a huge red ball crossing the road a few tens of meters from him and driving below. Emitting bright reflections and enveloped in dense smoke, the ball ends up stopping in a field. Disturbed by this observation, the mechanic went to report it to the highway police. The gendarmerie, on the order of the prefect, then neutralized the highway and an area of several kilometers around the object. The main witness and his family were cautiously taken to the hospital where they underwent a series of examinations. Civil Security and Military Security officers went to the scene of the incident with Geiger counters. Indeed, the fall of the Soviet satellite Cosmos 1900, equipped with a nuclear power generator, was expected at that time, and precise instructions had been given. The CNES pointed out quite quickly that at the same time Cosmos 1900 was flying over the Indian Ocean. Advancing carefully, the security specialists approached a sphere of about 1.50 m in diameter. They found that it bore no trace of the considerable heating and mechanical effects of re-entry and that it was covered with small mirrors. No smoke or radioactivity was detected near her. We will learn later that this sphere, intended to serve as an accessory to a concert by Jean-Michel Jarre, had fallen from the truck that was taking it to London. The small mirrors glued to its polystyrene envelope were intended to reflect the light effects of the show.

Elucidated or controversial UFO photos and films

On July 19, 1952, luminous spheres are seen above the city of Washington, D.C. Radar echoes appear on the screens of the surrounding air bases. Interceptors sent on site confirm the presence of balls and note their speed jumps, their sharp turns. A photo is produced late, which shows the Capitol overflowing with a dozen light balls, but it turns out that these lights are only the reflection, on the lens, of the lamps of the Capitol. In January 1958, a photographer from the Brazilian navy training ship *Almirante Saldanha* took six photographs of a metal disc flying over the island of Trinidad. These photographs would have been authenticated by several laboratories.

A photo taken during the Belgian wave of 1990 and known as the «Petit-Rechain photo» shows three luminous points forming a triangle. The authenticity of the document was controversial at the time. In July 2011, the author of this photograph acknowledged that it represented a piece of frigolite (name of expanded polystyrene in Belgium) painted and equipped with three small lamps. In March 1997, a light formation flew over the city of Phoenix (Arizona), more than two hundred witnesses would appear before the local authorities and the object would be filmed by nine amateur videographers. This event is commonly called Phoenix Lights. A local journalist, Erin Kozak, recounts “a similar incident” that occurred on April 21, 2008, allegedly caused by helium-inflated balloons.

The observation of Campeche, Mexico, took place in 2004 when Lieutenant Germ n Mar n Ram rez, a radar operator of a Mexican Air Force aircraft, spotted 11 radar echoes that he could not identify. Approaching the source, the aircraft’s infrared camera films 11 lights in Mexican airspace. Infrared recordings have been retained. Currently, the commonly accepted explanation is that of a mistake with oil well flares.

Controversial kidnapping cases

The story of the Hill couple was obtained under hypnosis. According to John E. Mack, it is a real

story. According to other practitioners, this is called false memory syndrome. Skeptics have argued that the stellar chart seen on board the flying saucer and identified by Marjorie Fish as that of the binary star Zeta Reticuli, consists of vague points and lines that can correspond to a plethora of stellar systems. How could the pilots of such an advanced spacecraft, they add, have been satisfied with such a rudimentary map?

#### Formal investigations

Over the past 50 years, many formal or informal scientific studies on the UFO phenomenon have been conducted by various government agencies and study associations. The majority of formal studies, such as the Blue Book Project, the Robertson Jury or the Condon Report, conclude that in-depth research “probably cannot be justified by the hope that it could advance science” and that “there is no evidence of any gear coming from elsewhere or posing a threat to the security of the United States” (Russian secret craft hypothesis). Some studies such as those of the GEPAN have remained neutral in their conclusions while suggesting the continuation of scientific studies on the subject to elucidate the most complicated cases.

#### U.S. Investigations

The American government decided to investigate the UFO phenomenon in the late 1940s and created various commissions of inquiry on the subject.

On July 9, 1947, the United States Air Force Intelligence Service, in cooperation with the FBI, secretly launched an investigation to investigate the best UFO accounts, including those of Kenneth Arnold and the crew of the United Airlines flight. The Intelligence Service reported using “all of its scientists” to determine if “such a phenomenon could in fact occur”. In addition, the research was conducted “keeping in mind that flying objects may have been a celestial phenomenon” or “a foreign body designed and controlled by mechanical means.” Three weeks later, they concluded that these stories of flying saucers are not all the result of the imagination or exaggeration of certain natural phenomena. There are really flights of something.”

A supplementary survey conducted by the technical and intelligence divisions of Air Materiel Command reached the same conclusions, namely that the phenomenon corresponds to something real and not to visions. These are disk-shaped objects that look metal and are as big as airplanes.” Their characteristics are “extreme rate of climb and manoeuvrability,” a general absence of noise, a lack of drag, occasional formation flights, and “evasive behaviour as soon as they are spotted by aircraft or radar with no hostile intent.” The 1954 Air Force Directive 200-2 defines a UFO as being “any airborne object having unusual behaviour, aerodynamic characteristics or peculiarities that do not correspond to any known type of aircraft or missile, or that cannot be absolutely assimilated to a familiar object”.

This directive states that UFOs of category B must be considered as a “potential threat to the security of the United States” and that the “related technical aspects” must be determined. In addition, Air Force personnel are instructed not to discuss unsolved cases with the press. At the end of September 1947, a formal study of the phenomenon was recommended by the Air Force. This led to the creation of the Sign project at the end of 1947, which became the Grudge project at the end of 1948 and the Livre Bleu<sup>54</sup> project in 1952. Blue Book ended in 1970, putting an end to the Air Force’s official investigations in this area.

Instead of flying saucer, UFO was suggested by Captain Edward J. Ruppelt, the first director of the Blue Book Project, who felt that flying saucer did not reflect the diversity of observations. Ruppelt recounts his experience in a memoir, *The Report on Unidentified Flying Objects* (1956), the first book to use the term UFO (pronounced “you-foe” by the author, but more generally spelled).

The Sign Project The Sign Project was the United States Air Force’s first official scientific study

of UFOs following the first sightings of flying saucers. This project, which saw the light of day at the end of 1947 under the leadership of General Nathan F. Twining, is headquartered at the Wright-Patterson Air Force Base in Ohio. He is under the command of Captain Robert R. Sneider. Although the project was classified as “restricted access”, its existence is known to the general public, often as the “Saucer Project”. The project also involves scientific advisors, such as the American astronomer J. Allen Hynek, who is responsible for detecting cases of confusion with stars or meteorites.

The first major undertaking of the Sign project was the study of the Mantell incident. Sign investigators came to the conclusion that Mantell had confused the planet Venus (actually visible in the middle of the afternoon at that time) and that he had been the victim of an oxygen failure and had hit a balloon. Investigators concluded that it was a Navy Skyhook balloon, dropped from Clinton, Ohio. This remains the official thesis.

Sign’s investigators, in favor of the extraterrestrial hypothesis, submitted a report in this sense called «Assessment of the situation» to the Pentagon. The staff were completely dismissed and the report destroyed. Only one copy was saved and, according to Pierre Lagrange, could be found at the National Archives in Washington.

This report was rejected by General Hoyt S. Vandenberg. The Sign Project was replaced by the Grudge Project in late 1948.

The Grudge Project The Grudge project was the second official study of the US Air Force to study the UFO phenomenon between 1949 and 1952. Led by General Charles Cabell, the project was criticized because of a number of demystifications. Like Sign, Grudge had established that the majority of UFO cases were due to misconceptions. But while Project Sign investigators had admitted to the existence of mysterious and unidentified cases, Project Grudge investigators asserted that all unidentified cases were probably caused by known phenomena. The Grudge investigators launched a public relations campaign to explain this to the Americans.

In August 1949, Grudge staff issued its report, stating that all analyses indicated that the UFO sightings resulted from:

1. a misunderstanding with classical objects;
2. a form of collective hysteria and nervousness;
3. individuals who invent these observations;
4. of people with psychiatric disorders.

Lieutenant Jerry Cummings, who had been appointed in charge of the Grudge project in the early summer of 1951, said, "Everyone laughs at the Grudge investigators." At the behest of the head of ATIC, General Harold Watson, the Grudge employees systematically depreciate the reports sent to them. Their only activity is to propose new or original explanations to please Washington.

The American astronomer J. Allen Hynek, having become a supporter of the extraterrestrial hypothesis, criticized Grudge for the same reasons. This is why the project is perceived by ufologists defending the extraterrestrial hypothesis as a demystification operation aimed at disinteresting the UFO population.

On 12 September 1951, Captain Edward J. Ruppelt took over the management of the Grudge project, which became the Blue Book project the following year.

The Blue Book Project

The Blue Book project, led by Captain Edward J. Ruppelt, was the most notorious of American studies on the UFO phenomenon. The three formal objectives of the Blue Book Project were to:

1. find an explanation for all the testimonies of UFO sightings;
2. determine whether UFOs pose a threat to the security of the United States;
3. to determine whether UFOs have advanced technology that the United States could exploit.

To this was added the role of government spokesman on the UFO phenomenon which forced, on many occasions, investigators of the Blue Book project to abandon the scientific aspect to respond to more political considerations.

The Blue Book Project examined 10,147 cases, of which 9,501 were explained. However, of the 3,201 cases selected for statistical analysis, 22% were confirmed but unexplained cases and 38% were reported by qualified military observers (pilots, controllers, security services). In addition to the 10,147 observation reports, the Blue Book archives include 8,360 photos, 20 reels of film (representing 6.5 hours of film) and 23 audio recordings of witness interviews.

This commission will be divided into a study section, an investigation section, a liaison with the Pentagon and civilian scientific advisors. As the number of UFO sightings increased in the year 1952, the upper echelons of the government began to pay close attention to this phenomenon and decided to intensify investigations in this area. In September 1953, Captain Ruppelt resigned from his position. Captain Charles Hardin took over the project in March 1954. Faced with numerous attacks on the opacity of the army about the UFO phenomenon, the captain decides to make public the special report No 14 of the Blue Book project. This report, which concluded that UFOs did not exist, was put on sale to the general public in October 1955<sup>57</sup>. Captain George T. Gregory was appointed to lead the project in April 1956. He was replaced by Major Robert J. Friend in October 1958. In April 1963, the Blue Book project came under the command of Major Hector Quintanilla. In March 1966, a highly publicized UFO sighting and the skeptical statements of the US Air Force led several civilian scientists of the project (including J. Allen Hynek) to publicly take sides for the reality of the UFO phenomenon and, against the official position of the Blue Book project.

The Blue Book project was thus officially dissolved in December 1969 and ceased all activity in January 1970. The archives of the Blue Book project, which were kept in the American Air Force archives until 1974, have been stored in the American National Archives since 1976 and can be consulted online.

Although the claim that astronomers have never reported on UFOs is common, the US Air Force reports that about 1% of the accounts on which the Blue Book project is based come from professional or amateur astronomers. In the 1950s, Professor J. Allen Hynek questioned some 40 of his colleagues, just over 10% of whom had observed unexplained phenomena. Hynek quotes Professor La Paz, director of the Meteorology Institute at the University of New Mexico, and Clyde Tombaugh, discoverer of the planet Pluto, who died in 1997. In the 1970s, Professor Peter A. Sturrock took up the subject exhaustively, sending a detailed questionnaire to the 2,611 members of the American Astronomical Association, guaranteeing them anonymity. Half responded and there are about 60 observations, or about 5%. So we can say that astronomers have a percentage of observations of NAPs comparable to that of the general population.

In his report, Major Quintanilla, director of the Blue Book project states: Only 30 of all cases submitted to the Air Force are unexplained and 676 of the 11,107 observations reported since 1947 fall into this category... There is no evidence that UFOs as yet “unexplained” represent

technological creations or principles beyond our current scientific knowledge.”

Media controversies led the US government to sponsor, in 1969, an expert report to Dr Edward Condon of the University of Colorado, in order to establish or not the reality of the UFO phenomenon. This report, covering about 100 cases, was released in 1969 as the Condon report. About 15% of the UFO cases studied by the Condon committee in 1969 were considered unexplained. The authors of the Condon report concluded that there was insufficient evidence to support the extraterrestrial hypothesis and therefore that studies on the UFO phenomenon should be abandoned. The report begins with a summary of the conclusions: Our general conclusion is that the study of UFOs over the past twenty-one years has brought nothing to scientific knowledge. Careful examination of the file as available leads us to conclude that further comprehensive studies of UFOs are unlikely to be justified by the hope that they could advance science.” They added that the UFO phenomenon was probably only due to misconceptions with prosaic phenomena, but that the cases remaining unexplained had to relate to cases of hallucinations or hoaxes. The Condon report was an important step in the development of the sociopsychological model of the UFO phenomenon, which remains today the majority position within the scientific community.

Fearing being ridiculed by rumours of «Martians landing from their flying saucers», the «trick» of finding rational explanations circulated in academic circles and was interpreted by supporters of UFOs as a conspiracy.

The conclusions of the report were heckled by some ufologists. Astronomer J. Allen Hynek, who has been asked to be a member of the Condon committee, says that he refused to participate in the committee because of an introductory document distributed by Condon to all members of the commission, which indicated, before any investigation began, the negative conclusions to which they were to reach.

Continuation of the collection of observations after 1969

In fact, until 2008, the Air Force Manual 10-206 (Air Force Instruction 10-206), in line with JANAP 146, indicated to the pilots, Radar operators and other members of the United States Air Force, as they were required to do in the presence of unknown aerial objects: to record altitude, direction of movement, speed, description of track and manoeuvres, what had initially caught their attention, how long the object had been visible and how it had disappeared. This information was then the subject of a report sent to NORAD (North American Aerospace Defense Command), which protects the airspace above the United States and Canada. Even though the American government had officially stopped investigating UFOs in 1969 with the closure of the Blue Book project, the Air Force, by injunction of NORAD, continued, forty years later, to collect and study the observations of UFOs. On Monday, December 18, 2017, the New York Times announced that the Pentagon has acknowledged the existence of a program investigating UFOs. The program, with a budget of twenty-two million dollars — out of \$600 billion a year allocated to the army — and only known to a small number of officials, was put in place by the former Democratic senator from Nevada, then leader of the majority in the Senate, Harry Reid, who had a special interest in unexplained phenomena.

In 2021, an assessment commissioned by the United States Federal Government resulted in the release of a report summarizing information on unidentified air phenomena (NAP). The Pentagon’s nine-page June 25, 2021 Report on Unidentified Air Phenomena focused on 144 observations of "unidentified air phenomena" by the U.S. Armed Forces, primarily U.S. Navy personnel, from 2004 to 2021. It categorizes observations into aerial congestion, natural atmospheric phenomena, U.S. government or industry development programs, foreign adversarial systems, and a final category of “other”. In the latter category, 18 of these objects were classified as having “unusual flight characteristics”. "appeared to remain stationary in upper winds, move against the wind, manoeuvre



abruptly, or move at considerable speed, without discernible propulsion." Some of them, according to the report, released radio frequency energy captured by American military aircraft.

France, too, has created several research organizations on the subject.

The Group for the Study of Unidentified Aerospace Phenomena (GEPAN) was an official agency of the CNES located in Toulouse and responsible for the study of the UFO phenomenon. Created in 1977 under the impetus of Claude Poher, this organization had the aim to carry out studies on the UFO phenomenon and to coordinate the reports of the national gendarmerie, civil aviation, the air force and Météo-France in this matter. He is the author of numerous statistical studies. Another of his missions was to inform the public about UFOs, by writing the Technical Notes (as Technical Note 16 on the case of Trans-en-Provence in 1981). In 1983, the Gepan was transformed into a much more modest service, with Jean-Jacques Velasco as president. Many rationalist scientists question the *raison d'être* of a service specialized in the study of UFOs, while ufologists criticize the reserve and the prudence of it. Finally, in 1988, GEPAN was replaced by SEPRA following the expert work of Professor Bounias on the plants collected at Trans-en-Provence, at the place of the presumed landing.

The Study and Information Group on the NAPs (GEIPAN) is placed under the aegis of a steering committee which gives the CNES its recommendations on its orientations and functioning. Chaired by Yves Sillard, former Director General of the CNES, it comprises fifteen members, representing the French civil and military authorities (gendarmerie, police, civil security, DGAC, air force) and the scientific community (CNRS, Météo-France, CNES). Of the nearly 1,600 cases in the CNES files, some remain inexplicable «despite the precision of the testimonies and the quality of the material collected», after investigation by GEIPAN. These cases are referred to as “Category D aerospace phenomena, divided into two sub-categories D1 and D2” or “PAN D”.

From this study conducted by GEIPAN investigators, the following figures emerge in April 2010:

- 9% of cases fully identified with supporting evidence (Category A);
- 28% of cases likely identified without formal evidence (Category B);
- 41% of cases not identifiable due to lack of physical data and/or unclear testimony (Category C);
- 22% of unidentified phenomena (category D, divided into two subcategories D1 and D2).

Note that if a public institution like GEIPAN lists civilian cases of UFO investigations, there is another institution, that military (whose existence was made public in the Official Journal of 12 January 1955), the Study Section of Mysterious Celestial Objects, or SEMOC. Its archives are classified Secret Defense, unlike those of GEIPAN.

Unofficial Reports In 2008, was created the Sigma commission within the aeronautics and astronautics association of France (3AF), its aim is to study the origin of the UFO phenomenon. In 2010, it makes a first progress report freely available. In 2012, the final report is made, which remains confidential. In 2013, the Sigma 2 commission was created to further research on the subject.

Switzerland

Officially, Switzerland does not keep statistics or have an official reference body.

In 1988, the French-speaking Swiss television, in the show *Tell quel*, questioned the reports of the Swiss army and UFOs, the Federal Military Department replied that it was the domain of secrecy. Surveys at European level

At the European Union level, the Committee on Energy, Research and Technology was to study the advisability of UFO research. In February 1993, the committee's rapporteur on this subject, the Italian physicist Tullio Regge, recommended the establishment of a European research on the model of the Septra of the time. This resolution was not discussed in the European Parliament for political and budgetary reasons.

#### Canadian Investigations

In 1950, the Canadian government created the Magnet Project under engineer James Wilbert Brockhouse Smith, who managed the project until its dissolution in 1954. This project was marked in particular by the statements of its director who, as early as 1953, made the following public statements: It then appears that we are faced with a high probability of the real existence of alien vehicles, regardless of their agreement with our view of things."

The Department of National Defence has conducted UFO investigations across Canada, particularly in Duhamel, Alberta, Falcon Lake, Manitoba, and Shag Harbour, Nova Scotia.

Moreover, in other countries, the army (United Kingdom or Spain among others), intelligence services (KGB in the Soviet Union), have investigated the UFO phenomenon. In Peru, a civil agency is responsible for the problem. In Belgium, the study of UFOs is left to private associations.

#### UFOs in popular culture

In popular culture, the term UFO is generally used to refer to a hypothetical extraterrestrial spacecraft. By extension, the term UFO is used to describe in a humorous way a character or an object that seems to emerge from nowhere and that generally has no future (example: «a UFO in the political landscape»).

The theme of UFOs and aliens has been an international cultural phenomenon since the 1950s. According to folklorist Thomas E. Bullard, "UFOs have invaded modern consciousness with irresistible force, and the relentless flow of books, magazine articles, popular newspaper covers, movies, TV shows, cartoons, advertisements, greeting cards, toys, . . . confirms the popularity of this phenomenon. ». According to a 1977 Gallup Poll, 95% of respondents said they had heard of UFOs, while only 92% said they had heard of U.S. President Gerald Ford just nine months after he left the White House (Bullard, 141). A 1996 Gallup Poll reports that 71% of the US population believes the government is withholding information about UFOs; a 2002 poll gives similar results (Roper poll for TV channel Sci Fi), but indicating that more people think that UFOs are of extraterrestrial origin.

Since the late 1990s, there has been a sort of demystification of the UFO phenomenon. In fact, since the discovery by science of many exoplanets, the theory that we would not be alone in the Universe is gradually emerging within the scientific community and the public, making less far-fetched the hypothesis of possible visits to the Earth by extraterrestrials. The publication of books in favour of the HET by scientists or ufologists, the holding of televised debates on the subject and the making available to the public of the archives of official bodies such as GEIPAN, participate in the acceptance of this phenomenon as the manifestation of extraterrestrial visits. In a 2007 survey conducted in France, 48% of respondents believe that aliens have visited Earth.

In a lighter way, in the field of Arts and folklore related to the UFO phenomenon.

Soviet stamp of 1967 representing possible extraterrestrial satellites.

UFOs or more generally aliens make their appearance in literature with *The War of the Worlds*, a novel written by H. G. Wells in 1898. This book, one of the first science fiction novels, was later to give rise to two cinematic adaptations, the first in 1953 by Byron Haskin and the second in 2005 by Steven Spielberg (who also directed *Rencontres du troisième type* and *E.T. l'extra-terrestre*, two other films on the theme of extraterrestrials). *The War of the Worlds* also led to one of the

most famous radio hoaxes of the 20th century, when Orson Welles, on October 30, 1938, led the American population to believe that it was being attacked by aliens from the planet Mars.

The beginning of the 20th century saw the birth of the myth of «little green men» or «Martians». Quite often, this expression is used to make fun of the possible existence of extraterrestrials. The colour green may have its origin in the novel by Edgar Rice Burroughs, *A Princess of Mars* (1912), which describes different species of Martians, including one with green skin. This color will be repeated by several other authors, even appearing in the title of their work, such as *The Green Man* (1946) by Harold Sherman or *The Third Little Green Man* (1947) by Damon Knight.

Another key event in the UFO folklore of the 1970s is the publication of Erich von D niken's book *Chariots of the Gods*. This author, who claims in his book that aliens have been visiting Earth for thousands of years, tries to support this hypothesis with various archaeological examples and unsolved mysteries (see *Theory of ancient astronauts*). Such ideas were not really new. For example, early in his career, astronomer Carl Sagan, in *Intelligent Life in the Universe* (1966), claimed that extraterrestrials have been able to visit Earth sporadically for millions of years. These theories have inspired many imitators, suites and novel adaptations, including a book (Barry Downing's *The Bible and Flying Saucers*) that interprets the miraculous aerial phenomena described in the Bible as written records of contact with aliens. Many of these interpretations tend to explain human evolution through the action of extraterrestrials, an idea presented elsewhere in the novel and film 2001, the *Space Odyssey* and at the basis of the cycle of the *Elevation of David Brin*.

The UFO phenomenon took a new turn in the 1980s, mainly in the United States, with the publication of the books of Whitley Strieber (*Communion*) and Jacques Vall e (*Passport for Magonia*). Strieber, a horror writer, believed that aliens harassed him and were responsible for "missing times" during which he was subjected to strange experiments. This new, darker vision is taken up by others with alien abductions and serves as a backdrop for *X-Files* and many other television series. However, even in this literature, aliens have motivations that can be benevolent. For example, researcher David Jacobs believes that we are experiencing a form of discrete invasion by genetic assimilation. The topic of genetic manipulation (without necessarily invasion) is also very present in the writings of Budd Hopkins. The psychiatrist John E. Mack (1929-2004) believed that the ethics of the «invaders» was to play the role of strict but good guides trying to inculcate wisdom in humanity.

The decade 1990-2000 was very prolific in films inspired by UFO culture and extraterrestrials, including Roland Emmerich's *Independence Day* in 1996 (also taking up the theme of *Zone 51*), *Mars Attacks* (1996), Robert Zemeckis' *Contact* in 1997, *Signs of Mr. Night* Shyamalan in 2002 (taking up the theme of crop circles) and *Men in Black* in 1997, 2002 and 2012 (taking up the theme of men in black).

Starting in the 1950s, groups linked to the UFO phenomenon, sometimes called contact circles, began to form. Most often the members of these groups gather around an individual who claims to be in direct or telepathic contact with celestial or extraterrestrial beings. The most notable of these is George Adamski, who claims to have been contacted by a large blond Venusian (called «Orthon») who wants to warn humanity of the dangers of nuclear proliferation. An Adamski Foundation took over, publishing and selling Adamski's writings. At least two of these groups attracted significant membership, *The Aetherius Society*, founded by the British mystic George King in 1956, and the *Unarius Foundation*, established by "Ernest L." and Ruth Norman in 1954.

In France, although the trend of contact circles is less than in the United States, a few contacts appeared in the 1980s, such as Franck Fontaine, protagonist of the *Cergy-Pontoise* affair, or Jean Claude Pantel, which claims to have been in contact with different types of entities for about

thirty years. These cases are nevertheless considered, by the greatest number and through different sources, as hoaxes.

The recurring theme of these alien messengers is the danger of nuclear proliferation.

The Ra lien movement, generally considered a sect, is one of the known groups based on so-called extraterrestrial contact, or The Ashtar Galactic Command.

“Men in Black” is a collective term for imaginary people from American ovnilogical folklore. Their goal would be to prevent humanity from accessing knowledge of extraterrestrial origin, deemed too dangerous for its survival. They would most often present themselves as agents working for the U.S. federal government. These people would arrive alone or in a group (usually in a threesome) at the home of the witness of a strange event after a delay that can vary from one day to several months. The witness sees in them sometimes agents of the government charged with stifling the affair, sometimes non-human creatures (extraterrestrials or humanoids) with mysterious objectives. They are often dressed in a dark or grey suit (suit for women), usually in the style of the post-war years (and whatever the date of their appearance), as is their car, when they have one.

Gray Barker, in a ufology classic, *They knew too much about flying saucers*, launched the theme of «men in black». About ten years ago, John C. Sherwood claimed that Gray Barker published articles in his UFO zine that were submitted to him as science fiction short stories. Men in black suits would therefore be a legend created from scratch, before it became part of 20th century American folklore.

Screenwriters have often taken advantage of the vague description of «men in black» to incorporate them into various episodes of television series. A comic and three films, *Men in Black*, *Men in Black 2* and *Men in Black 3*, as well as a role play of the same title, are inspired by this folklore.

Ufology is an unofficial discipline, often done by amateurs, which consists in collecting, analyzing and interpreting everything related to the UFO phenomenon (photographs, testimonies, ground traces, etc.). It was born in the 1950s, at the same time as the media coverage of Kenneth Arnold’s observation and the Roswell incident, reflecting the need for some people to understand and learn about the phenomenon. What characterizes ufology is that it consists of an unofficial study of UFOs, compared to the official studies of the United States Air Force or the CNES for example. Contrary to popular belief, ufology has no vocation to defend the extraterrestrial hypothesis of UFOs. Indeed, many ufologists study the sociopsychological aspect of this phenomenon, others even defend paranormal theories.

Ufologists include scientists and engineers, but more generally people with no scientific background. Ufology is often considered a pseudo-science by its detractors.

The majority of UFO sightings are based on the more or less precise testimony of one or more persons. Apart from cases based solely on testimony, there are cases, much rarer, correlated or allegedly correlated with direct or indirect physical elements. The explanation of these cases is subject to intense controversy, the link between the physical element and the testimony being the most generally contested aspect. Some of these cases have been analysed by various scientific and military government agencies. The direct physical data concerns cases detected by radar or photographed, the indirect physical data can be for example a trace on the ground or an environmental disturbance.

The correlation between witness accounts and science fiction scenarios has led some ufologists to look at the sociological and psychological reasons that lead some individuals to declare having seen a UFO. This branch of ufology is called the «sociopsychological model of the UFO phenomenon».

Unexplained Cases: Interpretations and Assumptions Detailed articles: alien hypothesis and unidentified flying weapon.

Alto-cumulus lenticularis, a motionless cloud formed by undulating fluxes, can cause misunderstandings. Statistics from studies of official government agencies indicate that the majority of UFO testimonies are based on an erroneous identification (or misunderstanding) of known phenomena. This is not controversial. Nevertheless, the debate continues with respect to unexplained cases. Two main trends have emerged: on the one hand those who claim that the socio-psychological hypothesis or even the hypothesis of flying weapons not-are the best to explain unexplained UFO cases as long as there is no evidence to support the extraterrestrial hypothesis. This is the position of the majority of the scientific community. Many sceptics go further and consider that all the observations could be reduced to prosaic elements such as an erroneous identification of astronomical phenomena, meteorological phenomena or human machines, to hoaxes and socio-psychological phenomena (known or unknown) such as complex misunderstandings, optical illusions, an unknown optical phenomenon or sleep paralysis (an explanation often given for so-called extraterrestrial abductions). This last point, tending to explain all the cases by the socio-psychological hypothesis, is now contested in so far as the investigations conducted on UFOs by different governments have not been able to determine the nature of all the cases (Category D cases according to the GEIPAN). These people include scientists, soldiers and pilots such as Carl Sagan, Peter A. Sturrock, J. Allen Hynek, Philip Morrison and Thornton Page, as well as members of the current GEIPAN. A similar work will also be carried out by the UFO subcommittee formed within the AIAA by Kuettner. NASA's aeronautics specialists Richard F. Haines and Paul R. Hill will also study various cases and publish technical literature on the subject. They encourage further research, especially on cases still unexplained by the sociopsychological hypothesis. Others go further by estimating that a fringe of unexplained cases could be due to extraterrestrial visits from Earth (extraterrestrial hypothesis). Among them are scientists such as Jean-Pierre Petit or Jean-Jacques Velasco as well as members of the French association COMETA.

The UFO debate has been going on for nearly 50 years. It is since 1947, in fact, that the phenomenon, (...), opposes in passionate partisan debates and opponents of the "extraterrestrial hypothesis". For the former, the testimonies relating to this phenomenon are an indication that our planet is regularly visited by beings from elsewhere. For others, the UFO phenomenon essentially boils down to a series of confusions and misinterpretations of observations or even hoaxes».

Skeptics consider that the UFO movement misinforms the general public by misleading them about the current state of the scientific debate regarding the nature of the UFO phenomenon. This idea is reflected in the title of some ufosceptic books, such as *UFOs: The public deceived: according to the author, those who deceive the general public are the ufological associations that try to propagate the «ideology» that there would be alien space vehicles visiting our planet. In addition, skeptics criticize the media, which all too often echo the extraterrestrial hypothesis, without a critical analysis of these theories.*

The Valensole encounter is, in the terminology of ufologists, a famous French case of encounter of the third type, where, in 1965, a Provençal farmer affirmed to have observed a flying saucer-like device landed on the ground and two humanoid passengers, without doubt the most known with the case of the landing of Trans-en-Provence on French soil. Minutes of July 2, 1965

According to the summary drawn up by the gendarmerie: "on 1/7/65, at a place called "Olivol", 2 km northwest of Valensole (Basses-Alpes), Mr [Maurice Masse], 41 years old, farmer, declares to have seen a "Flying Saucer" type of machine, the size of a Dauphine, with two passengers. An individual, about 1 m tall, of strong build, dressed in a suit, bareheaded, would have descended from the craft for a few moments. Then the machine would have disappeared suddenly at the speed of a flash. Declaration made to the gendarmerie on 2/7/65 at 8 p.m. - On the spot, Captain Valnet

noted traces which could possibly correspond to the effective installation of a device. This device had the shape of a rugby ball and the size of a Dauphine with a sliding door on the side and a top in transparent material. The witness will be heard again from 11:15 to 11:30 p.m. to complete some information.

Minutes of July 5, 1965

A report of the observations made on July 2 and 3 on the place of observation and on the traces on the ground will be established on July 5 by another brigade with measurements and photographs. An "unusual trace" was noted: a cylindrical hole 18 centimeters in diameter and 40 centimeters deep, in the center of four shallow grooves forming "a sort of cross".

Minutes of August 23, 1965

On August 18, 1965, the witness brought new details of the observation. According to him, he approached seven meters from the aircraft and saw the two passengers crouching in front of a lavender plant. Maurice Masse would have been immobilized several minutes after one of the two passengers had pointed an object at him.

Maurice Masse suffered from hypersomnia for several months. On the alleged departure trajectory of the device, the lavender plants underwent a degeneration over a hundred meters, and on the site itself, the lavender did not grow back before 1975, so there were traces whose effects are similar to those noted by Professor BOUNIAS on the Trans-en-Provence case.

No trace of radioactivity was found on the site. The rate of calcium, negligible in the vicinity, amounts to 18.3 % for the soil taken from the alleged landing site. According to the astronomer and ufologist Pierre Guérin, this rate joined to the infertility of the soil after July 1, 1965 would have been produced by the eddy currents induced by an electromagnetic radiation of the spacecraft, rather than by a deposit of fertilizer made by Maurice Masse.

There have been several possible interpretations. Alien visitors and Alouette helicopter.

1. Extraterrestrial visitors

Having gathered an important file on the case, *Phénomènes spatiaux*, the quarterly bulletin edited by the Groupe d'étude des phénomènes aériens (GEPA), writes: "We are inclined to think that Mr. Masse's lavender field has been the object of an unusual and, it seems, extraterrestrial visit".

2. Alouette helicopter:

The thesis of a helicopter was put forward on July 4, 1965, in an article in *Le Monde* (newspaper). The day before, according to *Le Dauphiné Libéré* (newspaper) of July 4, military circles estimated that the "flying saucer" was a helicopter belonging to the army's light aviation, most probably of the Alouette II or Alouette III type. Since June 29, the region had been undergoing maneuvers called "Provence 65", in which this light aviation participated. As Valensole is only 19 km from Manosque, the eastern limit of the maneuver area, it is almost certain that A.L.A.T. aircraft flew over Valensole, and a helicopter may very well have landed in Maurice Masse's field.

Dominique Caudron agrees in an article from 1990: the elements of the observation evoke an Alouette II helicopter with the characteristic whistling of the turbine when the rotor stops. That week, the army was organizing maneuvers in which Alouette helicopters were participating.

For Claude Maugé, it is not impossible that the witness saw a helicopter of the American 6th fleet on a spying mission; rather than recognizing a case of foreign incursion on French

territory, the authorities would have preferred to let the story of an encounter with the occupants of a UFO develop.

In an interview given to the *Provençal* on July 5, 1965, the witness declared: «The machine had the shape of a giant spider. I clearly counted six "legs" and a central pivot. [...] the device took off with a dull noise that has nothing to do with that of a plane or a helicopter. The machine had neither rotor nor blades. I have the pretention to know how to recognize a helicopter. It was not a helicopter. I am positive. [...] I never said it was a flying saucer.»

For Dominique Caudron, the traces on the ground evoke a liquid fertilizer tank installed by the farmer who owns the neighboring field.

Ufologist and comic book collector Raoul Robé has speculated that Maurice Masse's story was inspired by a story, "Passengers of Flying Saucers," published in 1950 in the illustrated magazine *À travers le monde*. Republished in 1960, this story has similarities with Masse's story: Provence as a setting, landing of a flying saucer, small aliens, paralysis ray. For psychologist Gilles Fernandez, this scenario is unlikely (but not impossible) because there are few similarities and too many differences between "Passengers of Flying Saucers" and the story of Maurice Masse.

In 2015, GEIPAN, "classified this case in category "D" by default, to facilitate the research of the Internet users" by giving to the public the access to the most reliable documents of this case, that is to say the three gendarmerie reports.

After revision of the cases classified as "D" by GEIPAN from 2005 onwards, the rate of non-explanation fell from 15 to 3%. Given its "strangeness", the Valensole case belongs to this category of "unidentified phenomena".

In any case, 54 years later, the UFO of Valensole continues to intrigue the curious. On July 1, 1965, a farmer from Valensole, in the hinterland of Provence, told of being paralyzed by two extraterrestrials, who had descended from a saucer shaped like a "rugby ball". This sighting, among the most famous in France, still attracts the curious. If Valensole, a few miles from Giono's Manosque, is particularly known for its lavender fields - so much so that the Chinese come to photograph themselves in large numbers, the setting having been used for a popular series there - this small commune of the Alpes-de-Haute-Provence with 3,000 inhabitants, has another vector of notoriety for a much older affair: the Valensole encounter. In Valensole, the stores do not display souvenirs of the famous meeting. But the locals assure us that it is part of the village's history. Whether you believe it or not. Back on July 1, 1965, in a lavender field near the city, in the Olivol district. It is 5:45 am, Maurice Masse, farmer, is busy hoeing. Just as he was about to smoke a cigarette, he heard a shrill whistle. He gets up, goes towards the place of the whistle and sees two small men, dressed in a kind of suit.

Their faces are astonishing: the head is oversized - two to three times the normal size - there is a hole where the mouth is, the skull is elongated, their skin is smooth. Behind them, a strange machine. This kind of aircraft is the size of a Renault Dauphine. Of matt color, it has the shape of a rugby ball, posed on small legs. Maurice Masse will not have the leisure to approach more. One of the men, lowered towards the lavender, rises and stretches his arm towards him. The farmer remained paralyzed for about fifteen minutes while the machine took off again with its two occupants in the direction of Manosque. Later, the farmer confided in the owner of a village café. The rumor spreads. The gendarmes summoned the young forty-year-old to tell them his astonishing story. As a preamble, Maurice Masse declares that he had neither drunk nor eaten anything that morning... and that when he went back to the place once, when the ground was soaked after the takeoff, this time, it was hard as concrete...

The gendarmes go on the spot to make some observations. Indeed, traces can correspond to an



object that has landed: we observe a kind of bowl in the ground, with four furrows forming a kind of cross. But the problem is that so many people have walked on the site during the day that there is not much left to work with. According to Maurice Masse, it will take ten years for the lavender to grow back in this spot.

But what happened on July 1, 1965 in Valensole? In the weeks that followed, as the curious flocked and the national press got hold of the subject, theories followed one another: helicopter, military device, foreign aircraft that spied on France, children's jokes, Maurice Masse's fabrication?

There were even journalists from abroad, from Moscow for example," reports another Maurice, this time Chaspoul, president of M moire Vivante, a heritage association in Valensole. Honestly, if Maurice Masse had wanted to do this for money, he could have earned a lot of it: he was invited to conferences all over the world: in Russia, in the United States, in China."

Except that the witness, tired of the recurring questions and doubts expressed about his story, gradually shut himself up about the meeting. He will not talk about this case anymore.

Maurice Chaspoul is the president of a local heritage association, enjoys telling the story of the UFO to the curious, proof that this story has stood the test of time, because half a century later, it remains anchored in the local memory, all generations included.

In front of the headquarters of the association "M moire Vivante", press clippings tell this strange story.

Five decades later, the alleged encounter continues to attract some curious people in the city. Maurice Chaspoul, a vibrant Provençal who welcomes them willingly in the cabinet of curiosities that constitutes the headquarters of his association, is not for nothing. This former general councillor describes himself as "the legatee of Maurice Masse's will", the one who is authorized to speak (the farmer died in 2004).

"I was his neighbor. Since it always interested people, over the years, he would ask me to tell it to



people who came and to journalists." In 2015, Maurice Chaspoul even decided to go further. For the 50 years of the meeting, he organized a festival of ufology with specialized associations. On the menu, some conferences, a saucer in the famous field, an exhibition recalling what happened...

Only the exhibition remains this year... and one should not expect to land at the Disneyland of ufology when setting foot in Valensole. If, in the opinion of the locals, the encounter is an integral part of the history of the village, there is no question of making a big deal of it.

Apart from the summer exhibition, a fresco on a wall representing the scene in a street, a few press clippings in front of the local heritage association and a walk in the form of an enigma of the third kind for children, the alien madness has not taken hold of the town. The field is not even precisely identified. "It is forbidden to make money on it", says Maurice Chaspoul, justifying the absence of small saucers on key rings in the shops. Too bad for those who had some intergalactic money to sell.

In 2015, Maurice Chaspoul organized a festival around ufology. A film on Maurice Masse and the "UFO" observed in 1965 will be released in 2022, directed by Dominique Filhol, director of documentaries on UFOs and the feature film "Valensole". The director Dominique Filhol has decided to adapt one of the most famous cases of French ufology into a feature film.

When UFOs land on French cinema, it's more like "La soupe aux choux" or "Le gendarme et les extraterrestres" than "Rencontres du 3e type". If Spielberg insisted on relying on abundant documentation and numerous testimonies to make his film credible, it is rather the hackneyed folklore of "flying saucers" that has inspired our French directors. And never the rich history of ufology in France had given rise to a film. Until now...

Dominique Filhol, author of two fascinating documentaries on the subject, "UFOs, an affair of state" and "The UFO office", has decided to devote a full-length film to one of the most emblematic events of the 20th century: the Valensole encounter in Provence. On July 1, 1965, at 5:45 a.m., Maurice Masse, a 41-year-old farmer, was taking a cigarette break while tending his lavender field. Suddenly, a whistling sound attracted his attention. The scene he discovered at that moment will mark him for the rest of his life.

On his field, a machine in the shape of a rugby ball "the size of a Renault Dauphine" rests on "six legs and a central pivot" similar, Maurice Masse will say later, to "a giant spider". But his journey towards the strange is only beginning. In front of the object, two individuals are busy, visibly interested in a lavender plant. But they are not ordinary visitors: they are not more than one meter tall, they are dressed in white overalls and their heads are twice as big as normal. Instead of a mouth, a black hole. Whereas he tries to approach them, one of the beings tends a kind of rod towards the farmer who finds himself at once paralyzed. Its constrained immobility will continue several minutes after the takeoff of the aircraft which goes at a bewildering speed in direction of the south.

Ufologists and journalists from all over the world jostle each other in the small village of Valensole. Unable to understand what he saw, Maurice Masse confided his adventure to a friend who was quick to repeat it to the whole village. He went to the gendarmerie, which drew up a factual report based on his testimony. On the spot observations make it possible to raise "traces being able to possibly correspond to the effective installation of a device". As for the lavender plants, they will take ten years to grow back in the place where the object would have landed. The ground became hard as concrete. Later, analyses of soil samples showed an abnormally low level of calcium but no significant traces of radioactivity.

When the news of his observation spread, the peaceful 40-year-old was swept up in a media whirlwind. Ufologists and journalists from all over the world flocked to the small village of Valensole.



Maurice Masse, after telling his story, had to defend himself as if he were guilty: no, he had not been drinking, no, he was not a mythomaniac, crazy or drugged. No, he didn't set up a hoax to become famous. Yes, he knows how to recognize a helicopter and what he observed had neither blades nor a rotor.

An article in *Le Parisien* (newspaper) in 1965 is devoted to the meeting with Maurice Masse. The tension is too great. The farmer sinks into a depression which the press echoes and from which he will have all the difficulties to recover. But without ever returning on his initial testimony, until his death in 2014: "Useless to cook me, I will not say anything more. Besides, I said everything. You know everything. Everything has been written. I do not deny anything either" he confided in 1990 to the newspaper *La Proven ale*, in one of his very rare public interventions after the effervescence caused by the event. Moreover, 57 years after the facts and in spite of numerous attempts to rationalize the case, the Group of Studies and Information on Unidentified Aerospace Phenomena (Geipan) still classifies this case among the 3% of the "D" category: Inexplicable. It is this encounter between an ordinary man and an extraordinary phenomenon that should be at the heart of Dominique Filhol's film: "It was important for me that the scenario be as close as possible to what Maurice Masse experienced," explains the director. "That is why I chose to make it a fictional story, in order to be as close as possible to his emotions, to what he experienced and to show the psychological impact that this event had on him but also on his family and his village. I'm as interested in the shock that an encounter of the third kind can provoke as I am in its marvelous side. According to those who knew him, Maurice Masse went through both emotional states, as he also told his wife Jeannette: "It was so beautiful, I wish you could have been there". For this first French fiction film adapted from a real ufological case and which could be released in theaters or on a streaming platform like Netflix or Amazon Prime, Dominique Filhol, is betting on a budget between 600 and 700,000 euros in order to best restore the settings and atmosphere of the time. To complete it, he opened a crowdfunding on *kisskissbank* which will be closed at the end of

May 2022. Only three weeks left, therefore, to get this project off the ground, with filming to begin at the end of June, on the very site of the Encounter.

The documentary "UFOs: A Matter of States" brings together the latest information on the study of unidentified flying objects, with the help of testimonies from key players working on this often taboo subject.

Director Dominique Filhol's film benefits from the presence of speakers whose expertise commands respect: renowned scientists, academics, members of the military, political and intelligence figures. All have a particularly demanding approach to the question of the existence of UFOs. "There is a term that is coming up more and more often among specialists on the subject, and that is the idea of 'non-human intelligence'. This term is interesting because it does not reject the extraterrestrial hypothesis but it includes many other theories as to the nature of the phenomenon", explained Dominique Filhol last April to the Paris Match website.

Viewers will find in particular images of several videos published between late 2017 and early 2018 by the American newspaper The New York Times, showing flying objects filmed, and commented by the pilots of the US Navy, whose authenticity was confirmed in 2019 by the American authorities. It was the New York Times, again, which had revealed in December 2017 the existence of an advanced aerospace threat identification program (AATIP) within the U.S. military. A program that has since been renamed, but still exists, and has an estimated budget of \$ 22 million per year according to information revealed by Senator Harry Reid - who is behind the AATIP UFO research program of the U.S. Department of Defense - in the documentary.

The documentary does not limit itself to the hypotheses of an extraterrestrial origin to explain these phenomena, and does not hesitate to approach other notions such as the existence of parallel worlds, time travelers, and the limits of consciousness.

"For more and more researchers, in cases of close encounters, the phenomenon seems to interact with the consciousness of the witnesses. This is what some US Navy fighter pilots who have observed these phenomena have reported: these objects seemed to anticipate the reactions of the pilots, as if they were able to read their minds," says Dominique Filhol in Paris Match newspaper.

UFOs are taken very seriously by the intelligence services. In "UFOs: a matter of states", Dominique Filhol approaches unidentified flying objects not as folklore but as a subject as serious as the scientists, politicians and experts who follow one another in this documentary. Among them, the former director of intelligence at the DGSE (French: Direction générale de la sécurité extérieure, DGSE) is France's foreign intelligence agency, equivalent to the British MI6 and the American CIA). Alain Juillet, who answered our questions. the former director of intelligence at the DGSE, Alain Juillet, expresses himself without taboos on a subject which, for many, still smells of sulphur: unidentified flying objects. With his immense experience in intelligence, he advocates a pragmatic approach and an open mind to elucidate a mystery too important to be left to dreamers and dogmatic skeptics. The General Directorate for External Security.

Alain Juillet is one of the high level speakers, politicians, scientists and military, who bring their expertise to Dominique Filhol's documentary, "UFOs: a matter of States". "There is a term that comes up more and more often among specialists on the subject, the idea of 'non-human intelligence'. This term is interesting because it does not reject the extraterrestrial hypothesis, but it encompasses many other theories as to the nature of the phenomenon," summarizes the director, who has been marked since childhood by spectacular testimonies from relatives who have observed unexplainable phenomena. The filming further strengthened his convictions: "The phenomenon has become palpable. I was lucky enough to be able to film a meeting of the members of the SIGMA 2 commission, which studies UFOs in a rigorous and scientific manner, or to meet Senator Harry

Reid, who is at the origin of the AATIP program of research on UFOs of the American Department of Defense. All these interviews confirmed my intuitions."

The succession of testimonies and analyses in "UFOs: A Matter of States" reminds us that UFOs exist, at least as a subject of study, but their nature remains elusive: "the hypotheses concerning the nature of these 'objects' are not limited to an extraterrestrial origin." Parallel worlds, time travelers: nothing can be dismissed out of hand. "There is also a current of ufology that studies the links between consciousness and the UFO phenomenon and this is a point that we address in the film" continues Dominique Filhol.

"For more and more researchers, in the cases of close encounters, the phenomenon seems to interact with the consciousness of the witnesses. This is in fact what some US NAVY fighter pilots who have observed these phenomena have reported: these objects seemed to anticipate the reactions of the pilots, as if they were able to read their minds."

As usual, the UFO subject takes us very far. A less perilous journey if one is well accompanied. It is in any case the conviction of Alain Juillet for whom politicians and scientists must now take the subject in hand.

You agreed to participate in Dominique Filhol's documentary, "UFOs: A Matter of States". Is it the first time that you intervene publicly on the subject of UFOs?

Alain Juillet: Yes. I had participated in a meeting of aeronautics enthusiasts where the problem of unidentified objects had been evoked. I was in the room and I had answered some questions. But I had never intervened on this subject publicly. It was after an interview with the director, Dominique Filhol, that we discussed this subject. He asked me two or three questions and said: "I'm interested in this, I'm preparing something. That's how it happened."

Did you have a particular interest in UFOs? Yes, even if I am not a fan. On the other hand, I am originally an intelligence man, and when you see things that are unexplainable today, you know that they can be explained tomorrow. It is simply that we do not have the elements to imagine or understand what is happening. In the particular field of UFOs, not to mention people who see a flying saucer land in a field, there are fighter pilots, astronauts, people who are anything but jokers and report very precise observations. We should not say that this is nonsense, but just recognize that there are things that we do not understand. It is in this context that I became interested in this problem because the first thing that we see when we study this phenomenon, is that obviously these machines or these apparitions do not function according to the terrestrial laws and in particular that they are not subjected to gravitation. The question which arises is: has a country developed a system which makes it possible to escape gravitation? Twenty years ago, I would have answered: "Why not? But, today, if a country in the world had made such a discovery, we would know it. No progress of this magnitude can remain secret. It is impossible.

If a country had such a technology, it would have already been used openly... One way or another, there would have been leaks, an indiscretion of the scientists who work on it... Since there has been absolutely nothing, it is that it is something else and that it escapes the terrestrial dimension.

Do the intelligence services have the adequate tools to deal with subjects as elusive as that of UFOs, the nature of which is unknown and the very existence of which remains open to question? For the subject to interest them, they must have received an order. In order to collect information, it is necessary to develop technical and human means. An intelligence service can only work on UFOs if there is a need expressed by those in charge, that is to say by the highest authorities of the State. If the latter consider that it is not a priority problem, which is generally the case, nothing happens. We know that the Americans have launched a very serious study with a large budget to try to understand. And it seems that other great powers, in particular Russia and China, have done the

same thing, probably for the same reasons: to discover if there is not something behind the UFO phenomenon that, technically speaking, could be interesting. Here I come to another aspect that I mention in the film and that has been explained by others who are much stronger than I am in this matter: we are moving from a vision of the world shaped by traditional physics to another vision based on quantum physics. And we understand these phenomena much better through the prism of quantum physics than through that of current physics.

Around the world, a few prominent political figures, such as former Clinton and Obama chief of staff John Podesta, have taken a public stand for greater government transparency on UFOs. Is this useful in your opinion? In the global competition that is raging today, especially between China and the United States, it is obvious that a new weapon that becomes popular because no one knows how to stop it gives a competitive advantage to the country that has it. The Russians, for example, have developed a surface-to-air missile system, the S-400, which frightens the whole world, because no one knows how to stop it, not even the Americans. The fighter planes prefer to go around them rather than risk being shot down. The Russians have also brought out the hypersonic missile, Avangard, which no defense can stop. Also interesting is this torpedo, developed by the Russians, of which one exploded in the Kursk in 2000, after being stuck in the torpedo tube. This torpedo moves at an incredible speed, several hundred kilometers per hour, much faster than anything else on the market. Why? Because this torpedo creates an environment in the water that is no longer water but air, which reduces friction to a minimum.

"I don't think the secret is really useful" This is in line with the research on MHD - Magnetohydrodynamics

Exactly... It's a machine that is formidable because its performance far exceeds that of any other. I'm not a dreamer, but when you see, as in the documentary, a machine that accelerates, slows down, goes through the water and comes out, all filmed by American fighter planes, you wonder. And we say to ourselves: "Aren't we getting there too? To return to quantum physics, it postulates that two separate points can be the same. This seems inconceivable to us, but from there, we can go very far, up to the possible existence of parallel worlds. As a comparison, a fly with its faceted eyes can see other dimensions than ours although it lives in our world. Perhaps there are things that are in our universe but that we cannot normally see because they are not in our field of vision. But maybe, from time to time, something happens, a phenomenon passes in our field of perception before disappearing from it. I am not talking about "little green men". I have rather the impression to be in the same approach as some scientists and astronomers who simply say to themselves "something escapes us".

From a military point of view, these researches touch the Defense, the national interests... Isn't there a contradiction between publicly claiming research on the UFO phenomenon and the necessity to maintain a form of secrecy?

I do not think that secrecy is really useful, except if we discover disturbing things. But we notice that the phenomenon has not shown, until now, any aggressive intention. So, there is no reason to worry, we are not in a horror movie... On the other hand, I do not believe that it is necessary to talk about it too much because many people will start to fantasize about it! If we say "UFOs are perhaps a reality" or that we evoke the advances of quantum physics, we will hear ourselves answering "oh the poor man, he has become crazy". As we go out of the classical relationship that people have with science, it is likely not to pass. And there is obviously the possibility that gurus will get hold of the question and say anything. We must not promote all this excessively, but try to remain scientific and to say to ourselves: there is something, it is indisputable. A certain number of factors lead us to think that it is next to us without coming from us and that it can come from

other worlds, why not after all... It is useless to dream. I come back to my original profession, we must try to ask ourselves: what conclusions can I draw from the elements I have? I don't have any conclusions, all I have is a certain number of clues that allow me to think without having any certainties.

"We need to think outside the box" We can risk a perhaps risky comparison with the irruption of Covid-19 as a radically new element in the lives of billions of people. We can see that societies adapt and integrate this event with calmness despite the threat. Wouldn't it be the same with the realization that the UFO phenomenon does not come from our world?

Absolutely. I think that people are adapting very well. If tomorrow morning, we have confirmation that UFOs come from a world parallel to ours, then everyone will say "well, there is a parallel world". The day we say it, within five years, everyone will have accepted it as a banal phenomenon. In "The Drum Crab", a film I loved, a Breton priest interprets white streaks in the sky as signs. And he leads his parishioners to follow them in one direction, then in another. At the end, exhausted, the faithful go home and we discover that these signs were in reality the trails left by the first jet planes that flew from Paris to New York...

What do you think of the work of Geipan, which within the CNES accomplishes a great deal of work in collecting information on Unidentified Aerial Phenomena? People in the intelligence field will tell you that the first work is the collection of information. In the first instance, we have to collect everything we can and they do that very, very well. Then, you have to select from this collection what appears to be really serious, and they do that too. After that, as far as the analysis itself of these serious elements is concerned, it is the specialists and high-level researchers who must reflect on this.

The GEIPAN, in spite of its work, seems to be little solicited by public or private research...

The analysis of Michel BOUNIAS, who questioned the plants present in the vicinity of the object seen by Renato Nicolai at Trans-en-Provence, they gave him several answers. The plants that were collected by the gendarmes four days after the event were not modified in terms of their appearance but on the other hand they had aged biochemically (first finding related to time, to the internal angle "time" of these plants), and there was another series of plants collected forty days after the event, it turned out that it had very important disturbances, upheavals of the biochemical mechanics of the plants and it showed that the variations observed were a function of the distance from the object, ie an equation between the position of the plants and the location described by Mr. Nicolai.

A quantification in  $1/\text{distance}^2$  corresponding to an electromagnetic phenomenon of a very important power. In 1981, in a village in the Var, a man in his garden sees an unidentified flying object landing on the ground. His testimony and the traces observed on the ground will trigger an investigation that will mobilize from the public services exceptional scientific means.

The Trans-en-Provence affair is for some ufologists the best case of close encounters of the second type in the world, even if critics see it as a simple hoax. In any case, the dossier retains its particularity and its interest because it mobilized at the time real means coordinated by the GEPAN (Group for the Study of Unidentified Aerospace Phenomena) and involved several scientific laboratories.

A close encounter of the second type (or RR2) is distinguished from the simple observation of a UFO (RR1) and the observation of occupants (RR3) in that it leaves material traces, which can be radar echoes, physical effects on the environment or traces on the ground. These last two elements are part of the Trans-en-Provence file and are even at the heart of the whole affair since their examination led to the conclusion that a «large-scale event» could have occurred on the site.

The entire scientific effort focused on the analysis of a trace on the ground, attributed to the presence of an unidentified object observed by a witness in its field. This is the strength of this case that remains emblematic in the field of the study of UFOs, because the analyses give extremely clear results. Therefore, the case of Trans-en-Provence has provoked debates of unprecedented violence between ufologists, GEPAN and skeptics, stresses ufologist Eric Zürcher.

This relentlessness, a real “war of religion”, was of course induced by the stakes: for the first time, scientists had made a serious investigation, with analyses, on traces of landing.”

“Two Overturned Plates”

On January 8, 1981, at around 5 p.m., Renato Nicolai, an Italian bricklayer on early retirement, is working on his land to build a shelter for a water pump. His attention is suddenly drawn by a hissing sound from the east.

Above a pine tree, he sees an object in the shape of «two plates inverted against each other», of dark colour. Then the object seems to fall at high speed almost vertically above a plot of land on a hillside, below the place where the witness is. He gets closer and finds himself about forty meters from the object which seems to him now posed, on the ground or motionless above the ground.

Almost immediately, the object rises again in the air very quickly, without noise, and then disappears behind the forest. The witness has just enough time to note that he is metallic in appearance, that there is a "rib" on his circumference and that there are four "feet" below him or "reactors" that have the shape of buckets upside down.

Two other circles evoke “hatches”. The size of the object is estimated to be 1.50 metres high and 2.50 metres in diameter. The observation lasted less than a minute. It was Mr. Nicolai’s neighbour who warned the gendarmes because she is interested in UFOs and knows the competence of the military on this point. She herself was warned by the witness’s wife, initially skeptical, but convinced the day after the observation by the traces that she and her husband discover on the ground at the place where he saw the object.

It is a circle of two metres in diameter drawn by a line about ten centimetres wide. The two sharpest marks, bleached, evoke a «rip» of tyre, like a tire that would have slipped, note the gendarmes.

High definition

In 2013, investigators from the CRUN (Centre de recherche ufologique niçois) obtained the famous photos of the trace taken by the gendarmes, but for the first time in high definition. Published by a magazine, they show a very visible trace and not very compatible with the hypothesis of «the cement mixer» advanced at the time. As the ufologist Fabrice Bonvin writes in the article accompanying the publication of the images “The quality of the original photographs makes it possible to attest categorically to the imposing mass of the object, demolishing the arguments of skeptics.” Why have these photos never been made public? “Lack of seriousness or unwillingness to confuse the issue?”

To date, Fabrice Bonvin believes the case remains strong:

“When you read Professor Bounias’ report, which talks about biochemical disturbances, it leaves very little room for doubt that something big has happened, as the GEPAN report says.”

However, the CNES (National Centre for Space Studies) did not broadcast this image quality earlier, and “negligence”, according to Fabrice Bonvin, or a desire to “keep this matter quiet”.

That is why we have to look back at the context of the time to fully understand the Trans-en-Provence issue. In 1981, the existence of the GEPAN was threatened by the arrival in power of François Mitterrand because his team would not support it. It will finally be replaced in 1988 by the SEPRA (Service d’expertise des phénomènes de rentrée atmosphérique) which will inherit the case

management. But this service has always been criticized by some for being just a public relations window, while others fantasize about the FBI team 24 hours a day. In any case, at the time, a contract was just signed with scientific organizations to conduct research as part of the investigation of observation cases, and the Trans-en-Provence file will put this agreement into practice.

“A large-scale event” It is especially the way in which the services have worked between them that will make it possible to brandish Trans-en-Provence as the best investigated case in the history of ufology, probably at the world level. Even if the costume is a bit large – a part of amateurism disputes it with a part of improvisation – it turns out that the object of study is not insignificant. The GEPAN coordinated major efforts of the INRA (National Institute of Agronomic Research) and several other laboratories to analyze soil and plant samples, taken in particular by the gendarmes the day after the observation. They have done an exemplary job that justifies, in part, that the GEPAN did not send an investigator on site for a month, which was criticized.

The INRA analyses were carried out by Professor Michel Bounias, then a specialist in the effect of radiation on plants. The latter has produced a sixty-page handwritten report entitled Biochemical disturbances observed in relation to the appearance of a “unidentified aerospace phenomenon” in wild alfalfa. All kinds of analyses have been done on plants, “on all factors of photosynthesis, lipids, sugars and amino acids,” the GEPAN report says. Plants appear to have undergone “accelerated aging.” This phenomenon of degeneration was visible to the naked eye in the case of the Valesole UFO by the farmer Maurice Masse, so we can conclude that the anti-gravity that allows the UFO to take off vertically without making any noise and to accelerate brutally by disappearing (inversion of the mass), accelerates the time for the living beings which are in proximity.

This phenomenon of degeneration was visible to the naked eye in the case of the Valesole UFO by the farmer Maurice Masse, so we can conclude that the anti-gravity that allows the UFO to take off vertically without making any noise and to accelerate brutally by disappearing (inversion of the mass), accelerates the time for the living beings which are in proximity. So this is the common point between the UFOs of Valesole and Trans-en-Provence.

Plants appear to have undergone “accelerated aging.”

Soil analysis alone suggests that it has occurred “a large-scale event resulting in mechanical deformations, heating, and possibly some trace material inputs.”

Biochemical analyses confirm that there are many differences between near-trace and remote samples. Michel Bounias talks about “amazing results” for the sample taken at the center of the circular trace “Quantitative alteration, [...] appearance of several compounds, [...] increase in glucose”, and the scientist concludes by evoking “biochemical monstrosities”.

Between 300 and 600°C Until his death in 2003, Michel Bounias will stand by his interpretation of the results. The skeptical thesis of cement and cement that could have damaged the plants had also been tested following the violent criticism he had received.

The hypothesis of pulsed microwaves has been put forward, but the experiment proposed with the physicist Jean-Pierre Petit to validate it could not be carried out.

Not only did Professor Bounias never go back on the conclusions in his report, but he was even more eloquent, less reserved, when he was then approached by journalists or researchers, says Bonvin. It was clear that something really abnormal had happened on the spot.”

At the end of the day, the robustness of the observations, photographs, interviews, samples, analyses, etc., made in this investigation is clear. Spectrometry, diffractography, crystallography, electron microscopy, biochemistry and other disciplines have been convened.

The final report of the GEPAN talks about a phenomenon that had a mechanical (weight estimated at several tons), thermal (heating between 300 and 600 °C) and biochemical (plant alteration)



effect. A debauchery of means which constitutes in reality what one is entitled to expect from a public service and, except to question the credibility of the scientists involved and to consider that they have all been mistaken, all the work done on the case is exemplary.

The typical saucer of the years 1950-1960.

A long article was published in the Journal of Scientific Exploration in 1990, signed by Jean-Jacques Velasco, then director of SEPRA, and accompanied by another article by ufologist Jacques Vallée, who also went to the site to meet the witness and take samples. Jean-Jacques Velasco will present the case at a ufology congress in Pocantico (New York State) in 1996, which will help position the GEPAN/ SEPRA as the ideal structure for many abroad.

Seen from France, it is quite different because the body of the CNES is constantly caught between two fires: it does not «not enough» for the ufologists and «already too» for the skeptics.

We can say that the case was polluted, believes Eric Zürcher. Someone even tried to bribe the witness to go back on his claims, but without success. Some points remain debatable. What's the circular track on the ground if the witness says he saw some kind of foot under the object? Maybe the trace ultimately doesn't match the object. There are weaknesses in every case, and there is a sense that this is only happening under these conditions, that there is at least one aspect that denies it."

In these cases, we cling to what is solid. In addition to the very thorough scientific analyses, it is important to note that the witness has always kept to his version of events. Now 88 years old, Renato Nicolaï recently left France to return to his native Italy. A passionate case investigator, Marilynne Helck, met him at his home last year. "He gave me an hour to talk," she recalls. He was tired but also moved, especially when I asked him if he still dreamed of his observation. He gave the same testimony as before, and he always seemed to me to be as affirmative and sincere."

What about the trace?

"The trail has always remained, it has never disappeared," said the 80-year-old, "but I sold the land and the new owner made improvements and now it's gone."

At the time, Renato Nicolaï had evoked the proximity of the Canjuers camp, and the possibility of a military object. We also talked about the Albion Plateau, a strategic missile launch site, located further northwest... The shape of the object is both banal and astonishing.

This is the typical flying saucer of the 1950s and 1960s, notes Fabrice Bonvin, and is one of the last landing cases, in a region known for observations. At the same time, it was a period of UFO calm and great skepticism, with books that had socialized the observations."

## 6 Curvature of the universe

In cosmology, the spatial curvature represents the curvature of the Universe (only in its spatial dimensions) in a homogeneous and isotropic model of the Friedmann-Lemaître-Robertson-Walker type. Intuitively, it gives a length scale which delimits the distances below which the universe can locally be described using a Euclidean metric, that is to say that the results of geometry in usual space (like the Pythagorean theorem) remain valid. In such a cosmological model, the spatial curvature is the only local geometric parameter which characterizes the structure of space. As usual in geometry, the spatial curvature corresponds (to the nearest possible sign) to the inverse of the square of the radius of curvature of the hypersurfaces of constant density existing in these models. Three cases are possible, depending on the sign of the curvature:

- Zero spatial curvature describes a flat universe. It corresponds to spatial sections described by Euclidean geometry. In particular the Pythagorean theorem is valid there, and the sum of the angles of a triangle is equal to 180 degrees.
- A positive spatial curvature characterizes a closed universe. It corresponds to the three-dimensional analogue of spherical geometry. The Pythagorean theorem is no longer valid, and the sum of the angles of a triangle is greater than 180 degrees. As a corollary, the angular size of an object of given size decreases less quickly with distance than in the previous case (and even increases with distance for an object located closer to the antipodal point than to the observer). One can easily visualize a two-dimensional space of constant positive curvature: this is the sphere. Its three-dimensional analogue, on the other hand, is more difficult to visualize.
- Negative spatial curvature characterizes an open universe. It corresponds to a hyperbolic geometry. The Pythagorean theorem is also not valid, and the sum of the angles of a triangle is less than 180 degrees. As a result, the angular size of objects decreases faster with distance than in the previous cases. On scales larger than the radius of curvature, it even decreases exponentially and nonlinearly with distance. A simple two-dimensional example is given by the one-sheeted hyperboloid (visually it is a horse saddle when it is immersed in three-dimensional space). Again it is not easy to simply visualize a hyperbolic three-dimensional space.

Visual representations of curvature are just visualizations of curvature using a third dimension, but defining a curved two-dimensional surface does not require a third dimension to exist. It is self-sufficient and does not need to be the surface of anything else. Similarly, there is no need for a fourth dimension to define the curvature of a three-dimensional space (see FIGURE 25).

From a cosmological point of view, Friedmann's equations relate the Hubble parameter  $H$  to the curvature  $K$  and the average density  $\rho$  of matter according to the formula (1):

$$3\left(\frac{H^2}{c^2} + \frac{K}{a^2}\right) = 8\pi \frac{G}{c^2} \rho \quad (1)$$

where  $G$  is Newton's constant,  $c$  is the speed of light, and  $a$  is the scale factor. The spatial curvature (unit: the inverse of the square of a length) here corresponds to  $K/a^2$ . By introducing the critical

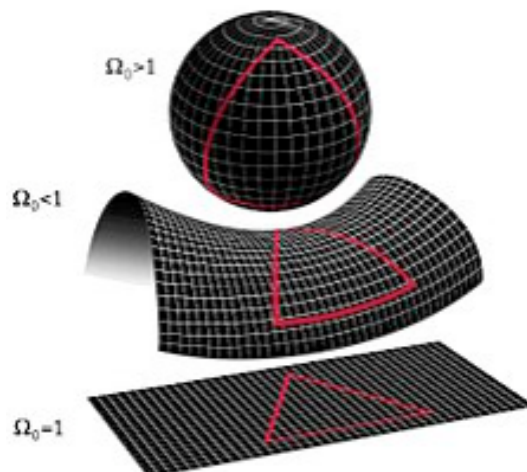


FIGURE 52: The three possible spatial curvatures. (The 1st image corresponds to positive space curvature, the 2nd to negative space curvature, and the 3rd to zero space curvature.)

density  $\rho_c$  and the density parameter  $\Omega = \frac{\rho}{\rho_c}$ , it is possible to rewrite the previous equality according to (2):

$$1 + \frac{Kc^2}{a^2H^2} = \Omega = 1 - \Omega_K \quad (2)$$

The radius of curvature  $R_c$  of the spatial sections can therefore be written in terms of the deviation from 1 of the density parameter and the Hubble radius,  $R_H = c/H$ :

$$R_c = \frac{R_H}{\sqrt{|\Omega - 1|}} \quad (3)$$

This last equality (3) allows us to see what possible deviation from 1 of the density parameter we can hope to measure. For the geometric effects (linked to the relationship between angular size and distance) to be measurable due to a non-zero curvature, the radius of curvature must not be too large compared to the radius of the observable universe. In the standard model of cosmology, the latter is of the order of three Hubble radius. Thus, the geometric effects due to a non-zero spatial curvature are measurable as soon as the quantity  $3\sqrt{|\Omega - 1|}$  is not too small compared to 1. It is sometimes said that the sign of the spatial curvature determines the future of the expansion of the Universe, this one experiencing an eternal expansion if the curvature is negative or null, or a stop of this expansion followed by a Big Crunch when the curvature is positive. This assertion is erroneous because it depends on the material content of the universe. If all forms of matter in the universe have zero or negligible pressure, then the previous assertion is correct. In the case where we have ordinary matter and a cosmological constant the situation becomes very different. In particular, a universe with positive curvature and positive cosmological constant can either come from a Big Bang and end up contracting (when the cosmological constant is weak), or have the same past, but an eternal expansion if the cosmological constant is sufficiently large, either to be static (this is Einstein's universe), or to have known in the past a phase of contraction, followed by a phase of rebound and an eternal expansion (one of the possible cases of the universe de Sitter). The standard model of cosmology is currently dominated by the idea that the universe experienced

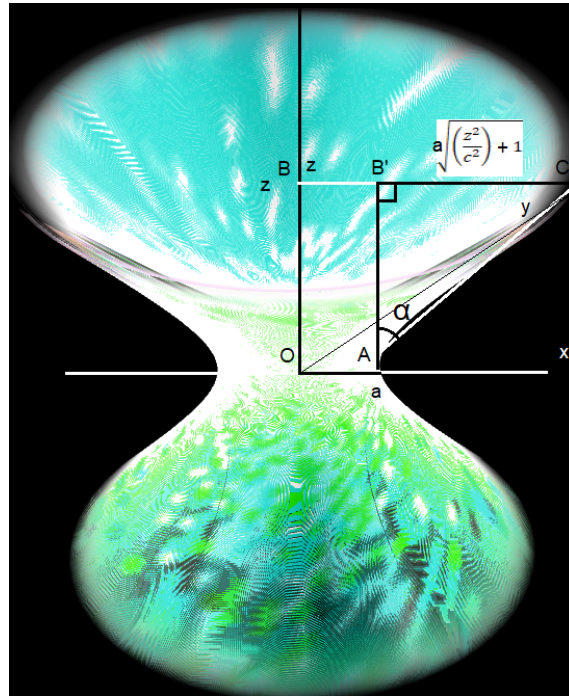


FIGURE 52A: one-sheeted hyperboloid of revolution parametrized by the angle  $\alpha = \text{Arctan}\left(\frac{a}{c}\right)$

an extremely violent phase of expansion in its past, called inflation. This model predicts that the spatial sections of the universe are Euclidean, in any case on scales of the order of the size of the observable universe. A proven deviation of the spatial curvature from the null value would be considered as a very strong argument against inflation, even if the latter could accommodate such a result, but requiring rather unnatural parameters.

The spatial curvature of the universe is determined by analyzing the anisotropies of the cosmic microwave background. Currently, the most accurate data are those provided by the Planck satellite in 2013. According to these measurements, there is a 95% chance that:  $-0.0029 \leq 1 - \Omega = \Omega_K \leq +0.0008$  (where  $\Omega_K = -Kc^2/a^2H^2$ ). So we still don't know if the universe has positive, negative or zero curvature. However, we can say that the radius of the universe is greater than 19 times the radius of Hubble if the curvature of the universe is positive and greater than 33 times the radius of Hubble if the curvature of the universe is negative. But according to OYAGAA AYOY YISSAA, the scientists who collected the data from the Planck satellite did not take the data from the right place. We will now demonstrate that the spatial curvature of the universe is negative.

A hyperboloid is in geometry a second degree surface of the Euclidean space. It is therefore part of the quadrics, with the main characteristic of having a center of symmetry and of extending to infinity. The non-trivial sections of a hyperboloid with a plane are parabolas, ellipses or hyperbolas. There are two types of hyperboloids, related or not, each related part being called a sheet. The cone can be seen as a degenerate form of hyperboloid.

In a well-chosen reference frame, its Cartesian equation is of the form  $\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} - 1 = 0$ .

The case  $a = b$  gives a one-sheet hyperboloid of equation  $\frac{x^2+y^2}{a^2} - \frac{z^2}{c^2} - 1 = 0$  (FIGURE 52A).

For  $y=0$ , and  $z$  fixed, we have  $x = a\sqrt{\frac{z^2}{c^2} + 1}$ , so  $\tan(\alpha) = \frac{a\sqrt{\frac{z^2}{c^2} + 1} - a}{z} = a\frac{\sqrt{\frac{z^2}{c^2} + 1} - 1}{z}$  and when the variable  $z \rightarrow \infty$   $\tan(\alpha) \rightarrow \frac{a}{c}$  i.e.  $\alpha = \text{Arctan}(\frac{a}{c})$ .

The angle  $\alpha$  only depends on the parameters  $a$  and  $c$  of the one-sheeted hyperboloid. It is a characteristic angle of the hyperboloid surface. Obviously no angle characterizes the surface of a sphere of dimension N.

A hyperbola is the intersection of a cone and a plane. We consider a cone of revolution generated by the rotation of a straight line (OA) around an axis (Ox) and we call  $\alpha$  the geometric angle between these two straight lines. On the other hand, we take a plane whose normal makes with the axis (Ox) an angle greater than  $\pi/2$ . If the plane does not pass through the origin O of the cone, it intersects the plane along a hyperbola. The cone can be seen as a degenerate form of hyperboloid, so the cone can be replaced by a one-sheet hyperboloid provided that the plane intersects the two symmetrical slopes of the hyperboloid. The intersection will form the same angle as with the cone. This angle  $\alpha$  is fixed, so that means that we can exhibit a fixed angle which characterizes a hyperboloid. However, no characteristic fixed angle can be exhibited from a sphere of equation  $x^2 + y^2 + z^2 = R^2$  (positive curvature) or from a plane  $ax + by + cz = d$  (zero curvature).

One-sheeted hyperboloids are used in construction, with the structure called hyperboloid structure. A hyperboloid structure can be built with straight steel beams, producing a strong structure at a lower cost than other methods. Examples include cooling towers and water towers. They characterize a universe with negative curvature. This model is the only one among the 3 curvatures (positive, null or negative curvature) to have a characteristic fixed angle, and the universe being angular, necessarily its curvature is negative. If we consider the twin universe of negative mass as a point of reference, then the twin of the twin is the universe of positive mass, that is to say our universe, or written in mathematical language this way  $T \circ T = \text{Id}$  where T denotes "the twin of" and Id denotes our universe.

So as the two universes are twins in terms of their geometric construction, they have the same curvature and the same radius of curvature. So the 2-dimensional mathematical function that represents the curvature must verify  $T \circ T(x) = x$  for any real  $x$ . The inverse function  $x \mapsto \frac{1}{x}$  representing a hyperbola verifies this relation for any real  $x$ .

For a circle of equation  $y = \pm\sqrt{1-x^2}$ , this is not true because if we compose this function with itself we find  $\sqrt{x^2}$  i.e.  $|x|$ . Therefore, only the hyperbola verifies this property. It should be noted that the mass inversion ( $m \mapsto -m$ ) is represented by the function  $x \mapsto -x$ . and verifies this property  $T \circ T(x) = x$  for any real  $x$ . The intersection of a sphere and a plane is a circle with equation  $y = \pm\sqrt{R^2 - x^2}$  whose composition with itself gives  $|x|$  for any real  $x$ .

So for the  $x < 0$ , the equation  $T \circ T(x) = x$  is not verified. This means that for negative quantities: mass, oriented angles, arrow of time oriented in the negative direction... present in the twin universe, it does not work. So the geometry of the pair of universes (universe A: positive mass and universe B: negative mass) is necessarily hyperbolic (negative curvature). The two twin universes therefore have the same radius of curvature and have the same curvature from a common point: the BIG-BANG. The two twin universes also have the same celerity of the speed of light in vacuum  $c$  according to equation (20) relating the radius of curvature and the celerity of light in vacuum. Necessarily, so you have to go to the twin universe of another pair of universes where the speed  $c$  is much higher. It is the Friedmann-Lemaître-Robertson-Walker metric with a space of negative curvature which must therefore be chosen with an accelerated expansion:  $ds^2 = c^2 dt^2 - a(t)^2 (d\chi^2 + R(t_0)^2 \cdot sh^2(\frac{\chi}{R(t_0)}) d\Omega^2)$

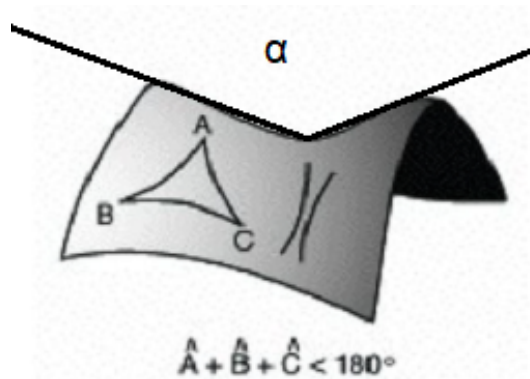


FIGURE 52B: horse seal shaped surface ( $\epsilon=-1$ ) with negative curvature parametrized by the same angle  $\alpha$  defined for the one-sheeted hyperboloid of revolution (FIGURE 52A)

where  $a(t)$  is the scaling factor;  $a'(t) > 0$  and  $a''(t) > 0$  (accelerated expansion of the universe),  $t$  is the cosmic time and  $\chi$  allows to determine the comoving distance. The space of negative curvature is represented (FIGURE 52B).

## 7 Description and explanation of the Ummite letters cross-referenced with scientific, religious and cultural history, the differences between these two civilizations are abysmal.

As a preamble, it is appropriate to pay tribute to Fernando Sesma Manzano (1908-1982), who was human, subtle and sympathetic towards the Ummite extraterrestrial visitors, it was he who received the first letters, a great number of letters. He is therefore of central importance in the UMMO file. Fernando Sesma Manzano (1908-1982), Spanish, employee of the telegraph in the civil and esoteric. Founder - in Madrid - of the society of the "friends of the space visitors" (amigos de los visitantes del espacio; 1954-1968). One of the main recipients of the Ummite correspondence from 1966 to 1969.

In the autumn of 1954, seven articles by Fernando Sesma on the theme "George Adamski and the flying saucers" were published in the newspaper "Madrid", as well as three articles by Sesma on the theme "The extraterrestrial origin of the flying saucers". On November 17, 1954 Sesma created with his collaborator Hilde Menzel the Association of Friends of Space Visitors (BURU; 1954-1968). The BURU is animated by Sesma at "La Baleine Joyeuse" every Tuesday. He is the author of the book "Los platillos volantes vienen de otros mundos" of 78 pages, published by Fiel in 1955. Sesma receives in 1962 his first phone call from Saliano, he will say that he had a voice like that of Mussolini. "Saliano" is the name of a race of extra-terrestrials or one of their members. They could be from a planet on the star HD23065 about 100 al from Earth Indeed : OAY status #17 of December 14, 2018, reopening the account with as status text: "100101110011 HD23065". ((HD23065 is a G8 type star located at 99 light years. The binary code "100101110011" is in the E36 which is the letter supposed to have been written by Saliano. Should we conclude that Saliano comes from HD23065. In 1965, he is the author of the book "Yo, confidente de los Hombres del Espacio" of 118 pages (Volume 48 of Colección Jirafa), published by Tesoro de Madrid (FR: "Moi, confident des hommes de l'espace").

This is an extract from letter D73:

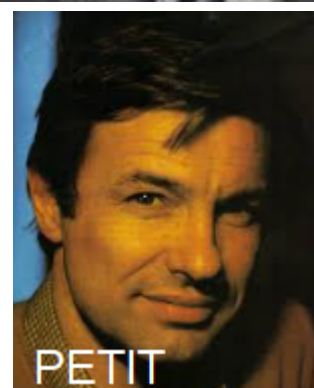
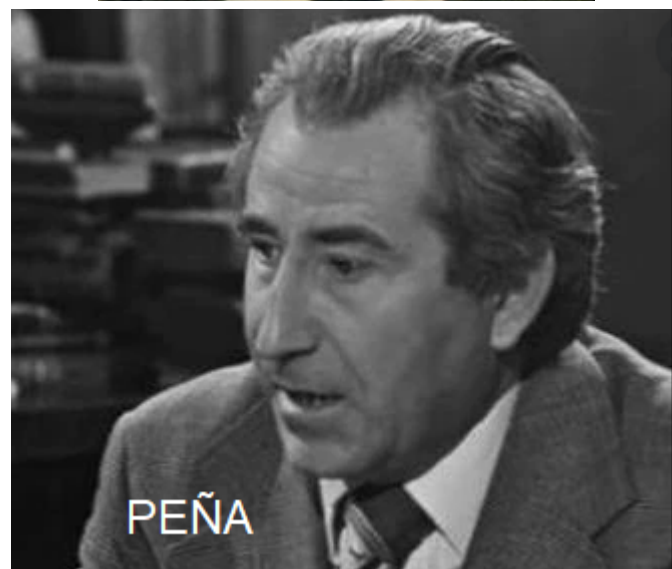
«[...] Madrid at the end of 1965. A modest publication called "Diez Minutos" inserted periodically a section entitled "the extraterrestrials speak" signed by a Spaniard: Fernando Sesma [between August 28th and October 23rd 1965]. The content of the writings seemed to us of little intellectual interest, full of repetitions and plagiarisms of aberrant ideas, and esoteric and magical fantasies. The author appeared to be a gullible man, with a certain humanistic training and almost no scientific level.

In the context appeared, from time to time, curious "symbolic" messages that the author attributed to extraterrestrial communicators. Their analysis did not reveal at first anything that showed such an origin.

But the astonishment of my brothers reached its peak when, by submitting one of them to our analysis unit, we discovered an unusual encrypted content. It was not a complicated encryption system. It was simply that the Spanish words with even numbers of letters were equivalent to the number zero and the odd ones to the number one.

The probability that a version of this type was significant in a code only known by social networks of high cultural and technical level was close to zero. It was practically impossible that the author of the articles invented this message. We can assure that no man on EARTH can, in the present state, know the meaning of it.

The coded message was however incomplete. We eagerly analyzed the successive writings. Our study was disturbed by the possibility that the originals had been altered by the author or





inadvertently by the linotype artist.

My brothers even decided to intervene secretly in the correspondence of Fernando Sesma (we beg this brother to apologize for the violation of his privacy). It was not necessary to wait long. A second message attributed to an entity called "Saliano" integrated the rest of the encrypted information [...].»

In 1966, these are the first telephone calls and first Ummite letters. On Friday, January 14, 1966, Sesma was called by DEI 98 and was informed of an imminent landing in Aluche (suburb of Madrid) on February 6. According to his book "Ummo, another inhabited planet" (1967), he was informed by telephone in 1966 that Ummo had about 1.8 billion inhabitants. In 1966, Fernando Sesma received a first ummite letter. Confirmation in the 1967 ummite letter for Manuel Campo (Extract from letter D21):

«In Spain, only Mr. Sesma Manzano seems to have accepted our identity (after having obtained evidence such as the anticipated announcement of our landing in Madrid on February 6th).»

Other extract from letter D21:

«The public servant of the General Captaincy of Madrid, Mr. Fernando Sesma Manzano (street Fernando el Catolico n°6). This gentleman had published some monographs about some contacts that he would have established with extraterrestrial beings, although his versions were distorted by elements that seemed to us fantastic. Elements in which magic, astrology and symbolism were arbitrarily interpreted, but where some points attracted our attention. We established a first contact with him on January 14, 1966, by submitting him to a series of tests in order to assure us of his good faith or his excessive credulity. Mr. Sesma was skeptical at first and we were able to verify his honesty while disagreeing with him about his previous experiences which we attributed to a simple prankster. Until today we have sent him a large number of documents concerning our Civilization and Social Structure.»

Sesma received a series of Ummite reports by mail in 1966 published in a magazine.

extract from letter D49 (1966) to D. Joaquin Valdes Sancho (MADRID):

«Dear Sir,

In the last few weeks we have been following the insertion in the magazine that you direct "Diez Minutos" of a series of articles. The first article appears in No. 760 of March 19, 1966, concerning the civilization of our Planet UMMO. The text, as you know, is based on a series of documents that we have regularly sent to D. Fernando Sesma Manzano. [...].»

There was also a poem in honor of the Ummites in the Letter D50 addressed to Fernando Sesma Manzano:

«Sir: my name is (expressed in terrestrial characters and in Spanish pronunciation) IEREE 86 generated by IEREE 82. I have not been in Madrid very long, and this beautiful Iberian city is not yet very familiar to me.

[...] When my brother DEII 98 [...] dictated to me the list of Spaniards in contact with us, I asked him about you, Sir. What scientific or philosophical specialty does he have? (you are aware that our UMMOAELEUEgeneral council gave us very precise instructions to reduce our contacts to only earthly men specialized in the field of Pure Science, Thought, Technique and Art).

My young superior to whom I am submitted answered me: OEMMII OIAGAA GAEOAO AIOOIAOOEMII UIAA OEMII EABAYO UAAM.... IIA (This man is noble. This man loves the Universe: that is enough!)

You can be sure that in these words she expressed many ideas that you cannot guess <even if you pretend to judge their terseness>. Immediately they offered me a long series of references

about you. I had known about your poem for a few days, before it was given to UMMO. For us, a gesture like this encloses a rich emotional content. I knew that the poem was the work of a Spaniard named SESMA but I did not know his personality.

Never has any earthling, among those with whom we have established verbal or postal relations, tried to listen to us in a spiritual way. Your beautiful attempt to establish a spiritual bridge through poetic images will never be forgotten by us.

The translation that we have done for our brothers in UMMO might not be to your liking. In fact, we would like you, if you have some knowledge of our language, to make the necessary corrections yourself. You will understand that this poetry is a very dear document for the History of the relations between the two Planets ».

In 1967, he published another book about E.T.: "Umno, otra planeta habitada" of 234 pages; volume 39 of Colección "Hechos y Figuras" published by Gráficas Espejo of Madrid (FR: "Umno, une autre planète habitée"; EN: "Umno: Another Inhabited Planet").

In 1968, Fernando Sesma announced the cessation of the "Society of Friends of Space Visitors" in the Barcelona magazine "Algo" n° 101 of March 1968. In July 1968 SESMA was interviewed for a program of the Argentine TV channel 13. On August 17 and September 7, 1968 SESMA appeared in a Spanish television program and gave a speech.

In 1969, Fernando Sesma publishes his book "La logica del visitante del Espacio" 146 pages, in March 1969 to the editions Tesoro of Madrid - the pages 59 to 91 are devoted to Umno.

The following excerpts confirm Sesma's importance in the Ummites' initiative to send mail.

extract from letter D73 (1969) to Mr Enrique Guerrero:

« At that time we had established a contact with Mr. Fernando Sesma by telephone. A simple "test" confirmed his true good faith and his weak credulity, which was not without a critical spirit. [...] We owe to the kindness of your brother Fernando Sesma the possibility that this psychosocial test could be carried out. In the basement of an establishment in Madrid, he ran an intellectual salon for men and women who were passionate about transcendental themes related to UFOs.

Mr. Fernando Sesma had asked for an objective testimony of our identity. Through a messenger we gave him a copy of the proof of one of our simple UULAYA NAI procedures.

Thus began one of our most interesting experiments to determine how a small group of OEMII-TERRE would react to the news of our existence ». Opinion of Saliario (read in public in April 1969) with this extract from Letter data-E/E33:

« Don Fernando Sesma is one of the men who serve us as intermediaries for our communication with the earthly humans and the only one authorized to spread them to the other men of Europe and America ».

This letter E33 is very important because we learn there that Fernando SESMA is manipulated by another race of extraterrestrial named "Saliario" and that there are other ethnic groups that visit the Earth since a very long time, before the birth of Christ.

Note by Javier Fraile Peláez (sent on Friday 22/11/2002, written in English and translated here): As narrated in various U-letters, Fernando Sesma was in contact with (and manipulated by, according to the Ummites) another ET civilization who used to perform psychological experiments on Earthlings. Behind the name "Saliario" were several individuals who contacted Sesma through "symbolic", apparently absurd, messages containing strange texts and pseudo-poems. These beings were detected and unmasked by the Ummites. In April 1969, Sesma allegedly received a message from one of these beings that, for the first (and apparently last) time, was written in "ordinary prose". Fernando Sesma sent a copy of it to the catholic priest Enrique López Guerrero in 1970, and the latter published it in his 1978 book "Mirando a la Lejanía del Universo". I am attaching a scan of this

short document here. It's in Spanish. If it is considered interesting, someone might wish to translate it to French/English

Note: The phrases in italics seem to have been emphasized by Father Enrique López, not appearing so in the original document. greetings.

Here below is the whole content of the letter of this extraterrestrial race "Saliano" addressed to SESMA. Looking in the distance of the universe.... p.439 Message read on April 18, 1969 by Fernando Sesma

«Your investigators know and are embarrassed to discover the origin of ships whose lenticular morphology has led to their denomination of flying saucers.

We know that the controversy is now centered among the specialists of your planet to know if their origin is Terran or from other points of the galaxy and even extragalactic as the most imaginative postulate.

We are going to offer you, in a condensed form, some exact versions verified by me and mine referring to the planetary centers where they come from: you can accept it or not since my affirmations are verbal, not accompanied by objective validations of a technical nature.

The spaceships (I use verbal terms of the Earth) have very distinct structural characteristics as it is easy to suppose according to the technical civilization that made the project, the design and built them. But the propulsion system of almost 80% of them is identical. Its technology is such that it allows them to cover distances, although this is paradoxical, in less time than that which a photon would take to move, and without the need for the mobile to develop a speed higher than the limit of the energy quantum.

About 22% of other galactic civilizations use different means and ships with a different superstructure and a radically different means of movement.

Therefore: men of the Earth, for this time I and mine communicate to you without using symbolic language, that :

From a planetary body that its inhabitants call (ZOEN) (it is the acoustic expression more approximated to the Castilian) located in a planetary system of the star catalogued by you as "Beta-Hidra macho" to 21,35 light years of you and whose inhabitants are of very small stature: size of which the statistical average is of 42,17 cm, they watch since the year 1721 after J.C. the terrestrial atmosphere without descending.

From a planet called (WVALA) by its inhabitants, located on a star that you have not catalogued, located at 27.88 light years, arrived recently (1963) on Earth and descended for the first time to Chile; but their crews descended only on limited occasions.

From a planet called (IOX) located on the star (HR 7703 a) whose inhabitants are of high stature, very intelligent and with very strict moral standards, come from the ships that periodically visit the Earth since the year 896 BC.

From a planet called UMO located at about 14 light years come peaceful crews that since 1950 have been visiting the Earth and taking advantage of their anatomical constitution similar to yours they have mixed with the earthlings to study them.

From a planet coded by a number [2] by its inhabitants come the oldest visitors of the Earth (since 31700 years before J.C.). They are tall with a scaly epidermis, anatomy a little different from yours. They come from a star that you have not catalogued, located 47 light years away.

From a planet classified by your astronomers as (70 Ofiuco a) (70 Ophucius a) located at 17.28 light years, come from unmanned observation ships that have been entering the atmosphere since the year 561 A.D. with great frequency.

From a star with a very complex orbital system of planets, located at 44.37 light years, come crews that observe you since 1906 AD, descending with frequency to carry out their experiments and studies. Its inhabitants are of very small size, macrocephalic, grayish skin (not greenish as some witnesses have identified them) and with a high cultural level. They are intelligent and are governed by high ethical standards. They give their planet a modulated name of difficult grapholiteral expression.

Three other civilizations exist, in which I and my people are included, and which for justified reasons we cannot mention.

The name given by me to my planet, in previous messages, was symbolic. The real existence of AUCO as a material entity is null.

Our mental structure is so different that it is only by means of symbolic verbal expressions that a more efficient communication can be achieved than this realistic form of binary logic that I am using in this message.

Don Fernando Sesma is one of the men who serve as intermediaries for our communication with the earthly humans and the only one authorized to spread it to other men in Europe and America ».

The Ummans (term that means human beings from the planet UMMO, the Ummites) say they know of 1581 life-bearing planets, 74 of which are inhabited by OEMMII (see the 4 factors of human) and in Letter D58-3 they state "The possible number of subspecies for human, analyzed by us, is  $9.10^6$ . Whether or not such races exist on a Planet depends on other factors").

Furthermore (Tweet OT 57) "We estimate that 1.2 million civilizations coexist permanently in the Galaxy. Up to 18 million if we add up the past." Therefore there would be at this moment more than one million civilizations in the Milky Way galaxy alone and we know that there are at least 2000 billion galaxies, do the math.

Tweet W1-102 of OAXIIBOO 6: Among the 74, 8 or 9 have known an OEMIIWOA (messia analogous to Jesus Christ), 19 are KAAÏOEMMII brothers. Among the 74 known civilizations + 3 unknown civilizations:

- 31 have access to galactic travel including the Ummites who are the last extra-terrestrials to have visited Earth. They say on this subject that they had never paid attention to our sun, although it is close to their star (14 or 20 light-years is not much for the detection of exoplanets); The direct detection of exoplanets is one of the most important challenges of modern astronomical instrumentation. It is based on high-resolution, high-contrast imagery (a planet such as the Earth is at least a billion times less luminous than its star), using so-called "extreme" adaptive optics techniques, stellar coronagraphy, and clever image processing, under development. Many projects to come in the largest terrestrial or space telescopes are offered there, and the future giant telescopes of more than 30 meters in diameter have found a *raison d'être* there. It will theoretically allow the detection of a host of planets of all sizes around nearby stars, informing us about the formation of solar systems, answering the nagging question "Is ours an exception?" and, associated with spectroscopy, will be able for the first time to characterize them chemically and thermally, revealing whether life is possible there, or even whether it exists there. But then why the Ummites with their deep knowledge of the universe and their technological advance of 4 centuries did not have the idea to detect a planet likely to shelter life around the Sun star which has a strong luminosity before 1950? maybe the answer is in the question...

- 23 at least have traveled to you ;
- 18 frequently ;
- 3 amoral;
- 1  $\approx$  hostile.

It is necessary in passing to make a small parenthesis to pay homage to Jimmy Guieu who had said 30 years ago in French television programs that there were about thirty extraterrestrial species which visit us; and thus thirty years later the Ummites (the Oummain) announce to us that there were at least 23 ethnic groups which visited our planet, therefore it was a figure close to the truth. This leading ufologist was ridiculed by the scientists and the representatives of the state.

Jimmy Guieu (literary pseudonym of Henri-René Guieu), born on March 19, 1926 in Aix-en-Provence and died on January 2, 2000 in Vernouillet, was a French science fiction writer, essayist, ufologist, videographer and radio man. He published in particular with Fleuve noir and wrote spy novels (under the name of Jimmy G. Quint), detective novels (under the name of Claude Rostaing), erotic novels (under the name of Dominique Verseau), or Claude Vauzière. He also collaborated with Philippe Randa and especially Richard Wolfram (real name Roland C. Wagner). He also benefited from the covers of Brantonne. Jimmy Guieu wrote his first novel at the age of 25 for the Fleuve Noir publishing house. "Le Pionnier de l'atome" (ENGLISH: the pioneer of the atom) (1951), very inspired by alchemy, was number 5 in the "Anticipation" collection.

In the 1950s, he became one of the pioneers of French ufology with Aimé Michel. In two documentary works, "Les Soucoupes volantes viennent d'un autre monde" (ENGLISH: Flying Saucers come from another world) (1954) and "Black-Out sur les soucoupes volantes" (ENGLISH: BLACK OUT ON THE FLYING SAUCERS) (1956), he delivers to the reader his conviction that flying saucers exist and that there is something behind the phenomenon. The merit of Jimmy Guieu, in writing "The Flying Saucers come from another World" (and what made this book so successful in France as well as in England and the United States where it was translated) was not only to have presented a great number of convincing testimonies and arguments, but also to have predicted the cyclic return - biennial - of the flying saucers for 1954. And the facts confirmed this "prediction" in a brilliant way.

Head of the Investigation Services of the C.I.E.O. (International Commission of Investigation OURANOS for the study of the Flying Saucers and related problems), member of various foreign organizations pursuing the same research, talented lecturer, Jimmy GUIEU was just the man to write this study which completes the elements of the "dossier" Flying Saucers come from another world. If this book has fascinated tens of thousands of readers in France and abroad, "BLACK OUT ON THE FLYING SAUCERS" will be a new source of enthusiasm for them... and of concern perhaps, because in this work the author attacks a strongly defended fortress: the Lie! Jimmy Guieu demolishes stone by stone the deceptive edifice built by those who have an interest in hiding the truth. He demonstrates how certain scientists, official personalities, and governments deceive the public, and underlines the dangers of this ridiculous "ostrich tactic" which consists of closing the eyes of the Earthmen, of putting their fears to sleep with false "explanations" allegedly scientific. Innumerable deceptions are implemented to make the BLACK OUT ON THE FLIGHTS. Jimmy

GUIEU denounces these vain attempts - in all countries - to disguise the truth, to deny the presence in our skies and now on the ground of our visitors from Space. For the first time, the Author makes public the amazing adventure of a Frenchman contacted by an extraterrestrial being and who received from him an optical instrument incomparably exceeding our current technical possibilities. **BLACK OUT ON THE FLYING SAUCERS** finally discloses the disturbing activities of certain mysterious men operating both in the United States and in France to "muzzle" those who hold the material proof of the existence of extraterrestrial spaceships! Visited by these unknown men, Earthlings have been living in fear ever since, terrorized, under a strange threat whose nature all the investigations carried out by the OURANOS Commission have been unable to uncover. **BLACK OUT ON THE FLYING SAUCERS** is not only a documentary work of prodigious interest; it is also and above all a cry of alarm that men must hear and put to good use before the official contact of the Beings from Space with humans. Some have already understood this. The "ALLIANCE" that these evolved Earthlings, initiated a few years ago, has now become a vital necessity. May all the "isolated" hear the important message that Jimmy GUIEU launches in the present work...

The preface to this book was written by the famous poet Jean Cocteau who was very interested in the UFO phenomenon. Since the end of August 1954, the number of sightings has increased rapidly. He was a member of one of the first French ufology research groups, the Ouranos Commission, founded in 1951 by Marc Thirouin. The Commission published a bulletin entitled *Ouranos*, of which Jimmy Guieu was the head of the investigation department.

In 1980, he co-founded with Roger-Luc Mary and others the association I.M.S.A. (World Institute of Advanced Sciences) which was dissolved in the early 2000s after his death. Some IMSA members came to work at the C.E.O.F. (Centre d' tudes Ovnis France) directed by Ren  VOARINO who devoted his life to the UMMO dossier. It was the ufological antenna of the IMSA before Guieu's death. This group of researchers had for objective the ufological research and the related phenomena, of which the research of the famous cave where the Ummites arrived for the first time on Earth. At that time, Jimmy Guieu got closer to the American ufology represented by Milton William Cooper by taking up the conspiracy theme, notably in the works "O.V.N.I. - E.B.E. - L'invasion a commenc " (1991), then "Nos ma tres les extra-terrestres" (1992) and finally the unfinished manuscript of "Terre ta civilisation fout le camp" (which leaked onto the Web in 1998). He animates a radio chronicle on RMC Marseille "Did you see the saucers?", sequence of 11 minutes in the broadcast "Zig zag" produced by Fernand Pelatan. From 1987 to 1990, he published ten unpublished stories featuring Gilles Novak at the Presses de la Cit , grouped together under the title of a series, "Les Chevaliers de Lumi re". In 1990 and 1991, he published two large "truth novels" (according to his expression), "E.B.E. Red Alert" and "E.B.E. 2: The Black Entity of Andamooka". At the same time, Guieu, a regular guest on Radio Ici et Maintenant, addressed the phenomenon of UFOs and extraterrestrial civilizations, in particular the thesis of the so-called "Gray" or "Little Gray" race. Considered by many ufologists and scientists as a proponent of the conspiracy theory, he mentions the Trilateral Commission, the Bilderberg Group, and the Council on Foreign Relations in his video "Les gouvernants secrets 2" (1992), as well as the Illuminati in "Les gouvernants secrets 3" (1993). Jimmy Guieu's productions are not limited to writing. Between 1991 and 1994, in the collection "Les portes du futur", of which he is the creator and director, he published a series of 14 documentaries on VHS video cassettes, in which he explains the presence of this hostile race: "the short greys" who had underground bases in the USA and Australia. These documentaries are for Jimmy Guieu a platform from which he bluntly criticizes the GEPAN, the SEpra, or warns the viewer against disinformation maneuvers orchestrated on a global scale by occult powers. Died of a generalized cancer, he leaves "Terre, ta civilisation fout le camp" (ENGLISH: Earth your civilization

is gone) A manuscript still unpublished but leaked on the Web. He criticizes a television program in which he participated (Ciel, mon mardi ! of February 5, 1996) and where all the public had laughed at his face on the occasion of this show, reproducing the letter of discontent that he addressed to Christophe Dechavanne, the presenter of this program. After his death, one of his friends, Guy Tarade, revealed in an interview that Jimmy Guieu was a Freemason of the Memphis-Misraïm rite. Aliens called "little greys" or "short greys" in Jimmy Guieu's investigations have abducted people with medical examinations, the abductees remembered the appearance of these beings because they were regressed under hypnosis and on this occasion they described these aliens: small beings around 1.30 meters with very dark eyes, very Persian, with a triangular face and skin that resembled that of a wet rat. This is probably the hostile race that the Ummites talk about in their tweets.

There would have been a treaty between the Greys and the Majestic 12, a secret group that exists at a very high level of the American military authorities and government, stipulating that in exchange for military technology, the Greys aliens were "allowed" to set up underground bases and and to abduct American citizens without harming them, bringing them back in good condition. In particular, there would be a very important base near the Dulce region in New Mexico (USA), which would have housed up to 18,000 little greys in the past.

Tweet W3-40:

Q: How many traveling civilizations are under hostile control? Could our BB avoid this domination?

A: Please consider the attached image. To avoid domination, do not sign any pact.

As the Ummites advise, in order not to be colonized, you must not sign any pact with an extra-terrestrial race. The Greys (amoral alien race the least evolved) seek to colonize the planet Earth, as they would find it difficult to maintain their own planet. They are also at the origin of the multiple mutilations of cattle which took place in the USA. According to Jimmy Guieu's investigations, they would suffer from a genetic deficiency so they were doing genetic experiments on Earth to see if cattle could help them fill these deficiencies. There would have been a pact between the MJ 12 (Majestic 12) with this hostile race, and the Ummites are here to prevent the greys from bringing the earth race under their domination. The Ummites told Raphael Farriols in the years 1975/1980 that there was an amoral species which was not precisely green but grey, alluding to the erroneous image of little green men. The greys, or the little greys have been known since 1987, since the confidences of John Lear, a former CIA agent. For Farriols, the greys under-consider us, ie consider us as inferior. But Farriols was too optimistic, we are inferior to all extra-terrestrial species that have visited us and are visiting us today. The Ummites if they wanted to could take control of any world power with just 180 of their own. The greys are an amoral race who have engaged in kidnappings, in particular of women to make crossbreeds, hybrid babies, there have been regressions under hypnosis which have demonstrated this and also to the mutilation of cattle. They would consider colonizing the Earth human race at the earliest in the next decades, if they could not remedy the structural or climatic decline of their planet. But according to the Ummites, they can still fix it. The Ummites do not underestimate us but consider us to be sick, to put it mildly.

Color legend

- black: DOES NOT travel (among them Earth, the black box with the letter T);
- turquoise: travel FREE (among them Ummo with the letter U);
- khaki and purple: swarm (it is assumed that we must consider that there are two distinct

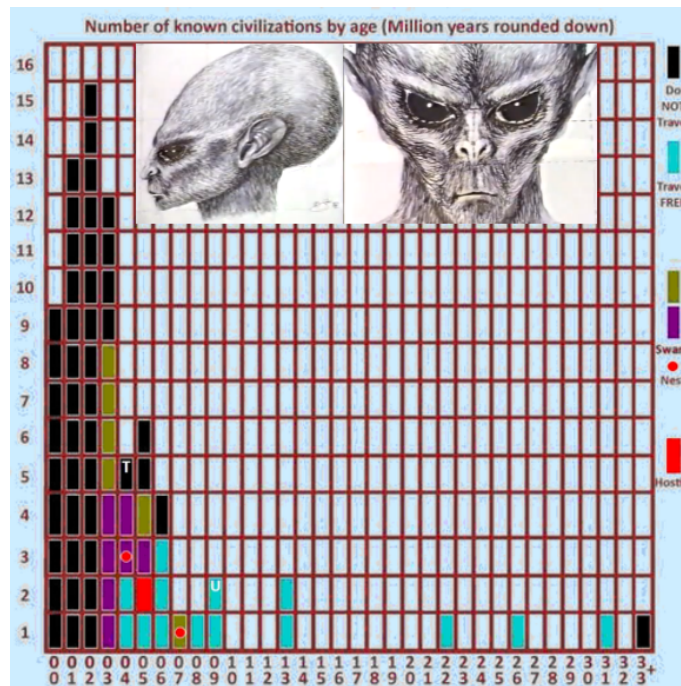


FIGURE 53: Graphics summarizing the evolution of known civilizations (their ages are given in millions of years of evolution), the majority of known ethnicities do not travel (in black), Earth is one of them, the Ummites will be there to prevent this colonization by hostile race (red rectangle).

swarms, a khaki swarm and a purple swarm);

- red star: nest:  
 AM1: the red star in the purple box in column 4 represents the purple swarm’s nest;  
 AM2: the red star in the khaki box of column 7 represents the nest of the khaki swarm;  
 The "short greys" whose sketch is given at the top of the graphic would be one of the two amoral races. They are a very typical race of aliens who are known to have done a lot of abductions of humans, especially women.
- red: hostile

Tweet 312-50(03/17/21):

«Indeed, we maintain friendly relations with non-travellers. Interference with them is only didactic and remains acceptable as long as the technological exchange is not the desired goal. We welcome on OOMO all travelers who wish to exchange serenely with us. We send you an improved diagram below.

In response to Manuel who wrote "19 races are KAAIOEMMI, but only 13 (+1) races travel freely. This seems to indicate that you have fraternal bonds with at least 5 (+1) races that do



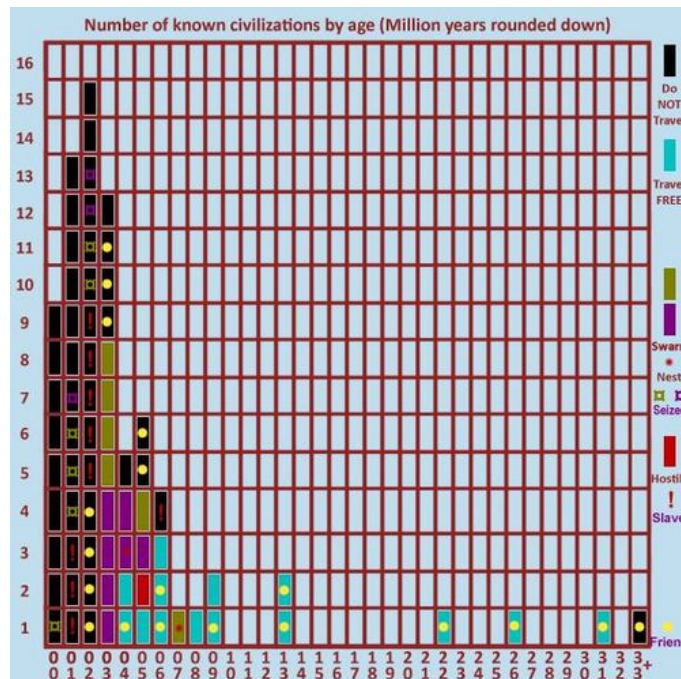


FIGURE 53A: Number of civilizations by age (Millions of years rounded down)

not travel. (But only 12 modules are entitled to receive guests, many of whom are only "formal relations").» There are therefore two amoral races AM1 and AM2 which have colonized several ethnic groups which travel under their domination:

1. the red star in the purple box in column 4 represents the purple swarm's nest (The short greys are the AM1 race because they are less technologically advanced than the AM2 race. The little beings of Roswell were traveling under their domination, they were frightened when they saw the proximity of the American soldiers). The bodies of these beings were recovered by US authorities, they were not traveling freely;
2. the red star in the khaki box of column 7 represents the nest of the khaki swarm (AM2 race);

- Black rectangles: do not travel (it is understood that they have not accessed the technology to travel between stars). For example, the Earth race, but OAY said we were not very far from this technology, in 2021: « You will be able to travel between the stars, in a fairly short time, wait for the light to come out of the tunnel.»
- Light green rectangles: travel freely (these are non-subject races)

- olive green and mauve rectangles: Swarm: (planets dominated by one of the two amoral races AM1 and AM2)
- Nest: (home planet of each amoral/ olive green and purple race)
- Seized: These would be ethnic groups that have not yet "traveled" but who already have a dominated status. Roswell aliens are one of them.
- Hostile (this is the planet of the hostile race, the most harmful of the three)
- Slavic: these are the planets under the domination of the hostile race
- Friends: these are the 19 planets KAAIOEMMI (siblings of UMMO).

Amoral civilizations AM1 and AM2 are represented in the image by a purple rectangle (AM1) and a light brown rectangle (AM2), with a red dot above them in both cases. These two red-dotted planets are therefore the "nests" from which the respective "swarms" departed, which were colonized 11 other planets in total, each of which is represented in the diagram by a purple or brown color, according to the civilization that dominated it. The 11 semi-colonized indigenous civilizations can travel in space thanks to the technology provided "gracefully" by their "partners", but under their domination. Indigenous civilizations will always be named to them. The common goal of the two amoral civilizations is for Earth to expand their list of subjugated planets, through the cunning methods described in the previous sections.

We present everything we know, with great reliability, of the current presence of extraterrestrials on our planet. Data come mainly from information provided by the Ummans by different channels, some of which are very recent. These channels are:

- a) Letters received between 2011 and 2014 by a Franco-Spanish group (called "letters GR1-").
- b) Emails sent from four accounts via the Twitter network. Two of these accounts continue to operate currently.
- c) To a lesser extent, certain old letters, including the "letters françaises", the authenticity of which was finally recognized like letters a) and b).

Most visiting civilizations are benevolent and limit themselves fundamentally to be observed, faithful to a universal ethic which imposes non-interference. They do not intervene, therefore, or in a limited way. There are however exceptions. Of the 23 visiting civilizations—perhaps it would be more accurate to say "of the 18 frequent visitors", but this is unclear—3 are "amoral" and "unscrupulous", and 1 is downright "hostile".

The "hostile" civilization, whose age is not specified but is between 5 and 6 million years (the terrestrial civilization has approximately 4 million years, and the civilization is about 9 million years old),... "wishes to extend its colonies to OYAGAA [the Earth] by not hesitating to force you to submit". The Ummans categorically state: "We will not allow it", and underline that they that

they count on the collaboration of other civilizations that share the same ethical principles as they do. The hostile civilization was imposed on them by the Ummans and their allies] a policy of ostracism and strict rules, the violation of which would result in coercive measures. The hostile civilization prevents the civilizations it has subjugated from traveling in space. The Ummans do not approach these colonized planets to avoid "a conflict".

To the question of a subscriber asking why the most advanced civilizations (referring implicitly to the 3 unidentified ones, and assuming that they are ethical) do not intervene to hinder the plans of the immoral and hostile, it is answered that hostile, it is answered that they intervene and a concrete example is quoted: that of the dematerialization of a "huge" unwanted nave over the city of Author: Dennis M. F. (Dec. 2017) - (translation from Spanish: S. Gardenteapot Jan. 2018).

The "amoral" civilizations play a darker and more dangerous role, since, unlike the aggressive "hostile" civilization, directly neutralized, the amoral races carry out their plans in such a way that that the Ummans and other similar civilizations cannot openly oppose them by force. (This is the reason why we think that the dematerialized nave would belong to the would belong, in any case, to the hostile civilization). First of all, a point must be clarified. Although the tweet that provides the list of civilizations mentions "3 amoral races", the Ummans only talk about 2. Probably, in the original list, the hostile civilization was included among the 3 amoral the 3 amoral ones (with a higher degree of "amorality", of course).

Both "amoral" civilizations are dedicated to expanding their "territories of influence influence by dominating other peoples", not by invasion, like the hostile civilization, but by hostile civilization, but by a veiled colonization via "the fear and the adulation", by taking advantage of the weaknesses of the coveted planets and signing pacts with them that, finally lead them to a situation of submission. The term used by the to describe the sad condition in which the deceived civilizations are kept prisoner is "under kept prisoner is "under dominion". These dominated civilizations, once they have they have the technology of space travel (surely provided by the corresponding amoral civilization within the framework of the signed pacts), can carry out such expeditions expeditions -in contrast to the colonies of the hostile civilization- but always under the supervision/control (we don't know to what degree) of the race to which they are they are linked to. One of the amoral civilizations (let's call it AM1) has an age of about 4 to 5 million years, that is to say of the same order of magnitude as the Earth, although its technological superiority makes us suppose that it is older. AM1 has semi-colonized (so to speak) 6 planets in total, of which 4 are in the interval 3-4 million years, 1 in the interval 4-5 M-years like the Earth and AM1 itself, and 1 in the interval 5-6 M-years; i.e. older than it. (Because of this, it seems that this, it seems that it is not really possible to universally associate with technological superiority, as we have just done a few lines above, and even less so if lines above, and even less so if the difference is "only" 1 million years or years or less. Author: Dennis M. F. (Dec. 2017) - (translation from Spanish: S. Gardenteapot Jan. 2018) 4 The other civilization, AM2, is between 7 and 8 million years old and has 5 planets under dominion, 4 in the interval of seniority of 3-4 million years years and 1 in the interval of 5 to 6 million years. We observe that the civilization is older than the hostile civilization (at least 3 million years) and the amoral civilizations (respectively at least 3 million years and 1 million years more.

Of these amoral civilizations it is specified: "They are not hostile, but they want a bilateral alliance alliance with us. In return, they offer miraculous solutions to our ills. "Any alliance would be detrimental in the long run to our evolution as evolution as OEMMII. [Any alliance would be detrimental to our long-term evolution as OEMMIIIs. Our elites imagine, wrongly, that they will benefit first from the agreements that our visitors are dangling. (In connection with this last

statement, point 14 explains its relation to the "crop circles. "(In connection with this last statement, point 14 explains its relation to the crop circles). In response to the question: "In general, what would be the socio-economic model proposed by [amoral civilizations]?", the Ummans answer with a brief tweet: "1 - Abundance = territories in exchange for technology." "2 - Restriction = services by technology." [This pithy tweet deserves an explanation. It would seem that it is necessary to read: - Abundance means: if you have territories to trade (in the case abundance of material goods) you trade these territories (or these goods) for goods for technology]. - Restriction means: if you have "restrictions" on what you can trade (materially) you can exchange (materially) we will exchange services (your labor force for example) services (e.g. your labor force) for technology]] Finally, the brief sentence that accompanied a comparative table of civilizations needs needs no further comment: "To avoid domination, do not sign a pact."

The Ummans attempted a formal rapprochement with the American authorities (official or unofficial/real) several decades ago. (official or unofficial/actual) authorities several decades ago. Their proposals were rejected. On the contrary, "unofficial" (and certainly occult) relations still exist on the contrary, "unofficial" (and certainly covert) relations still exist today "within international military such as NATO" with "unscrupulous" visitors. These beings are Author: Dennis M. F. (Dec. 2017) - (Translation from Spanish: S. Gardenteapot Jan. 2018) 5 called, "wrongly", "reptilians" (we suppose that the denomination was given to them by given to them by their first terrestrial interlocutors). The name is due to the appearance of The name is due to the appearance of these E.T.: "a livid skin of ophidian appearance", and to their "hissing language". Thus, beyond their appearance, we deduce that these beings have nothing of reptiles and are mammals - because, according to the Ummans, this is determined by the universal cosmobiological laws that govern hominization. In fact, in the letters received by the aforementioned French-Spanish group (before the tweets), the references to reptilians are in quotation marks, and it is worth noting this expression: "A report will follow on exogenous ethnicities linked with what you you call 'reptilians'." Everything seems to indicate that the "reptilians" are therefore the two civilizations, and that the term "reptilian" is really a nickname. It has been clearly established (see DOCUMENTARY SOURCES) that the anatomy of at least of at least one of the two amoral breeds corresponds to the typical aspect of the small "greys" (it seems that that there are greys of different types and sizes). One could thus deduce that, although their terrestrial interlocutors call them "reptilians", the ufological research has come to call them "grays". The gray color is probably quite pale ("livid skin"). livid"). We believe that these grays are AM1, based on the following considerations: - AM1 is a much more recent civilization than AM2 (point 6), so its technology is probably more primitive. - The technology of these amoral gray beings is indeed "rudimentary". (To be precise, we admit that the text in question, alone, does not identify unequivocally the beings it mentions, but the reference to the "small stature" and to the context - the end of the 1940s - designates beings similar to those of Roswell. from Roswell. - It is not surprising that a technology described as "rudimentary" leads to accidents, like the one in Roswell. - In short, the "little grey beings/Roswell/primitive technology/AM1" hypothesis, although it involves some speculation, is at its best although it includes certain speculations, is at least self-consistent. The Ummites have not provided any information on the appearance of AM2. Unlike AM1, whose typology is moreover already "strongly implanted in the the only thing that has been said about these AM2 beings is that they are "darker [GTP: "darker"]. "darker" (of course, in a metaphorical sense: "darker" in the original). metaphorical sense: darker/blacker -to us- may mean that they are more unnoticed).

On FIGURE 53 and 53A, each rectangle represents a civilization. We have added a T to indicate where the Earth is, and a U for Ummo. We see that that the Earth is in the age range of 4 to 5

million years, with four other civilizations (known by the Ummos). Ummo is in the segment of 9-10 million years, with another civilization. The turquoise blue civilizations (the turquoise blue civilizations (the Ummos, for example) have access to intragalactic travel and are free: to travel]. The red rectangle identifies the hostile civilization that, without the fortunate presence of the Ummans and two other civilizations would have colonized the Earth by force, as it has already done it has already done with an indeterminate number of technologically inferior civilizations, which it civilizations, which it maintains in "slavery". Their colonies, in undefined numbers undefined numbers, are some of the unfortunate planets represented by black black rectangles in the left part of the image. The black color indicates that the civilization in question does not make interstellar voyages either because of its scientific and technological development (like the Earth itself), or because it is a colony because it is a colony of the hostile civilization.

On FIGURE 53A, the most advanced civilization (33 million years old, at the right end of the table) appears in black because it in black because they no longer WANT to travel "physically"-perhaps they continue their explorations with automatic ships without crew.

The amoral civilizations AM1 and AM2 are represented in the image by a purple rectangle (AM1) and khaki (AM2), marked with a red dot - in both cases. These two planets with a red dot are thus the "nests" ("nest" in the text) from which they from which they have developed their "swarms", which have been established on 11 other planets in total. Each one is represented in the table by the color purple or khaki, depending on the civilization that colonized it. These eleven indigenous civilizations semi-colonized civilizations can travel in space thanks to the technology "offered by their "partners", but under their domination, to which they will always be subjected. to which they will always be subjected. The objective of the two amoral civilizations is to add the Earth to their list of subjugated planets, by means of the methods described in the previous paragraphs.

Faced with the strangeness caused by the fact that very ancient civilizations, advanced civilizations ignore the scientific foundations of morality, the Ummans explain that these explain that these amoral races "know BB" (the collective soul, specific to each planet), but "deny the existence of B (the individual soul) and WOA (God). Of these beings the Ummans say that they "behave like ants" and that "they are and that "they are taught from childhood to conceal their feelings". All this seems to indicate that amoral civilizations have a very strong gregarious character in the worst sense of the word; individuality is practically banished (they do not believe in the individuality is practically banished (they don't believe in the individual soul) and probably not in freedom either. It can also be said that their expansionist also say that their expansionist policy is facilitated by the lack of consideration for consideration for other civilizations, which, of course, do not share their BB. By denying the existence of WOA, they probably reject any universal moral precept conduct with other civilizations, and, in any case, their "impersonal" culture may very well be "impersonal" culture can most probably ignore the individual consequences: the particular fate of an ant is of no importance in relation to the global fate of the colony of the colony, which is the only important concept and to which everything is subordinated in the the ant farm. With such a philosophy, it is not surprising that these civilizations have "morally repugnant plans" for the future of the Earth, as stated in a recent in a recent Umma letter. As if the known elements of the ("morally repugnant") intentions of these of these two civilizations in relation to us were not disturbing enough, the latest tweet received on this subject -at the time of writing- transforms the previous statement Any alliance would be detrimental in the long run to your evolution as an OEMMII". evolution as an OEMMII" almost into a delicate euphemism. To the question by a twitter subscriber: "Can you go deeper into the differences between the two amoral races? Which is the most dangerous?"

Role of each in the "NWO project NWO" [New World Order]", the answer from the Ummans is speechless: Both would like to turn your descendants into healthy bodies Both would like to turn your descendants into healthy, unemotional bodies of mere AAGAOEMII: Author: Dennis M. F. (Dec. 2017) - (Spanish translation: S. Gardenteapot Jan. 2018) "domesticated man], legally hired by pseudo-divine pseudo-divine masters for futile rewards.

The reason why amoral civilizations do not directly use their technological superiority to technological superiority to dominate other civilizations (like ours) is not clear. is not clear. It could be because their ends do not require it, and may even be opposed to it. opposed to it. But, without excluding this hypothesis, it seems very probable that in addition an openly aggressive behavior -similar to that of the hostile civilization- would not be tolerated by the most advanced and ethical civilizations (like the Ummites) who also visit the Earth. The Ummites say, explicitly: "We cannot work effectively against this undesirable interference in your social in your social network. Any repressive action against them would have serious consequences. These OEMMII have a legitimate claim to interact with your to interact with your military authorities. They do not cause you direct harm to you in the strict sense of the word. They are not the hostile people". It seems that from this answer and from other data presented below, one can come to the worrying conclusion that, if the inhabitants of the Earth "left to their own devices", no one could prevent them from signing their own suicide. The problem, of course, is who has the right to negotiate agreements on behalf of the whole of humanity. We will now complete the information the available information on this subject.

In spite of what has been said, there are indications that the action of the amoral humanities humanities could have been hindered by the friendly civilizations that visit us, and that friendly civilizations have intervened at some point. In a French letter of 2003, the Ummans explained: "We have had permission to interfere in your social network since 1948. Before that, we were denied permission to visit your solar system. solar system had been denied to us. We did not even know you existed. (...) Recently, however, there have been violations of this ban by other visitors from a solar system that we did not know existed. the existence of. "These small-scale OEMMIIIs had rudimentary but unconventional unconventional technologies that surprised the brothers who normally monitor your planet. brothers who usually monitor your planet. The latter did not have time to They did not have time to make contact with them to dissuade them from interacting. Your governments then accidentally became aware of the presence of these of the presence of these visitors and their technology, advanced from your point of view. Author: Dennis M. F. (Dec. 2017) - (Spanish translation: S. Gardenteapot Jan. 2018) 9 of view. This situation desired by us required a break of the strict policy of non-interference that was in force for your planet. (...) " (...) there is a tacit pact of non-interference at the level of the various OEMMII travelers who visit other stars inhabited by a form of life more life more evolved than the simple pluricellular organisms. It is a common sense rule that consists in not influencing the development of a planet development of a planet if this influence is not necessary or explicitly explicitly desired by the OEMMII race that would populate it. The common sense sanction that we would apply to OEMMII who would violate this violate this tacit agreement would be a total refusal to cooperate with them and with them and the implementation of specific means, possibly coercive, intended to coercive means to thwart their actions. A punitive sanction destructive sanction against these visiting OEMMIIIs could not be enacted, except in case of case of obvious will to harm, which to our knowledge has not strictly occurred on strictly occurred on Earth. In this case, the group of OEMMII the most most able to intervene is free to do so provided that it can justify this act of justify this act of legitimate assistance to the other OEMMII brothers in the galaxy. (...) "(...) (There is a race of

OEMMII whose technology is beyond our understanding our understanding and which seems to monitor different planets by probing the OUEWA who are incursions. We can say that OUEWA have been deliberately dematerialized within your atmosphere by what we atmosphere by what we have interpreted as an OAWOLEIIDA caused exogenously to these ships, we suppose, by these OEMMII with advanced technology." Are they talking about the Roswell case (1947) in the 2nd paragraph of this quote? Further (cryptic) references to Roswell and the policy of interference are given in the paragraph.

THE MEETING WITH EISENHOWER... "AREA 51"? Proponents of disclosure ("disclosure") are familiar with a whole series stories that have been circulating for decades about the alleged relationship between the U.S. government (or those who control it) and one or more races aliens. In the hodgepodge of more or less fantastic or baroque theories, we can distinguish some common elements which appear in a way recurrent... Here are the data confirmed by the Ummans:

- In 1954, the race of grey aliens (AM1, presumably) landed "for the second time" at Edwards Air Force Base. These beings said they were coming of a dying planet on which they could no longer survive in a indefinite future. "Preliminary agreements" were signed with them. (The counterpart include facilities in Area 51 and elsewhere? Any questions regarding the specific details of these "agreements" have been dodged by the Ummans). Author: Dennis M. F. (Dec. 2017) - (translation from Spanish: S. Gardenteapot Jan. 2018)

- A "human-looking" ("Nordic") race also came into contact with the authorities (probably North American) to alert them of the danger of the "Greys". They offered to help Humanity, demanding the destruction of all nuclear weapons, and warning that their contribution would be only spiritual to get out of self-destruction. We can make a parallel with the extraterrestrial who met Rael (Claude Vorilhon) and had promised him to make terrestrial humans benefit from their 25000 years of technological advance only if they abandon the weapons of self-destruction. They refused to offer new technologies to those who, on Earth, were not even able to use healthy way the ones they already had and would use any input to the worst ends. The proposal was received with suspicion. Fearing that this "unilateral" nuclear disarmament leaves them defenceless, interlocutors rejected the agreement.

Compare the result described in the previous paragraph with the statements of this tweet:

"Your main military powers know our presence and our intentions. An official reconciliation was attempted, there is several decades. The exclusively military objectives of your leaders quickly made it fail." The mysterious expression of the tweet "exclusively military objectives" is now fully explained by the event alluded to (and confirmed by the Ummans). The conclusion is obvious: the "Nordics" exist and they are the Oumans. For more information, see DOCUMENTARY SOURCES. It is certain that President Eisenhower had a secret encounter with beings aliens in 1954, while vacationing in Palm Springs. And these were these "Nordic" human beings who warned him against the intentions of the grays. All seems to indicate, therefore, that these "Nordics" were the Ummans i.e the Ummites.

Jimmy Guieu called them the tall blonds, but the tall blonds were probably the Ummites. The fall of the Soviet Union, contrary to what J.GUIEU had hoped, did not lead to the abandonment of nuclear weapons, the recent threat from Vladimir PUTIN, and the maneuvers of NATO show us that the we are not out of potential self-destruction. OAY, the leader of the Ummites currently on Earth confirms that the Ummites will intervene in the event of nuclear war.

THE "MEN IN BLACK" AND THE MUTILATION OF CATTLE. 1966. The "Men in black" (MIB) are not a myth: they exist. (OAY 31) These are the "representatives of one of the races that interfere with your military authorities". Word "representative" admits several interpretations.

It could be beings of the race in question (it is excluded that it is AM1 because of their physical appearance of "grey"), it could be terrestrials who would represent them (which is unlikely despite the more or less "normal" appearance of the MIBs, given the strange physical and behavioral peculiarities that are often attributed to them), it could be AM2 beings (if they were human-like enough), or still beings of one of the "supervised" races, whether AM1 or AM2, chosen for their reasonable resemblance to Earth humans. Livestock mutilations are also real and are practiced by extraterrestrials, with the help of military forces". (These events have occasionally been associated with the presence of helicopters and/or personnel in uniform without insignia or badge. Although the Ummans did not want to respond to the question about the purpose of such practices, we can assume that they are experiments genetic/biological. Author: Dennis M. F. (Dec. 2017) - (translation from Spanish: S. Gardenteapot Jan. 2018) To the question of whether the Ummites present on our planet would take a physical risk in opposing these individuals of amoral/hostile races, the response was: "Yes, regarding the races (2) that interfere with your military powers." That is to say, the amorals. Responding to another question from a subscriber who was basically wondering (logically) if it was possible that someone could have made formal agreements with unknown "extraterrestrials", who do not even have a legal existence, the Ummites are as pithy as they are firm: The military can use private contracts for technology or security issues. There are legal contracts since 1966.

#### “CROP CIRCLES” AGREEMENTS AND NOTICES

In a French letter of 2003, the Oummans (another name for the Ummites) clarified the origin of the crop circles or crop circles: “You are surprised by the crop circles that appear spontaneously in the within your fields. Many of your brethren do believe that prankster OEMMIIIs equipped with simple wooden planks would know how to cause. When will this ingenuity end? Yes, these signs are traced, in their vast majority, by OEMMII travelers outside your planet. They are not of our making but we know the breed of OEMMII that produces them. The morality of these OEMMII is high and we do not condemn their actions. Their objective is not simply to exercise a form of artistic expression detriment to your harvests but to cause a catch of progressive awareness of extraterrestrial reality through a legitimate question concerning the origin of these signs. » In fact, a year earlier, in 2002, a truly unique crop circle had made its appearance at Crabwood, near the English towns of Winchester and Chibolton. He depicted an "alien" type face attached to a disc bearing a series of "pixels" arranged in a spiral, as in a CD or compact disc. This series of "pixels" turned out to be the ASCII codification of a text written in English, whose translation is: “Beware of FALSE Gift Holders and their PROMISES NOT REQUIRED. A lot of pain but [there is] still time. BELIEVE. He there is good there. We oppose deception. Close this channel. [BellRing] » In November 2015, a twitter follower posed the following question: “In response to a 1st series of questions [from the same subscriber], You answered (OAY 31): “Your elites wrongly imagine that they will benefit first and foremost from the agreements that make your visitors dangle. [see point 6]. Your remark joins the warning which was addressed to us by the cropcircle of Chibolton in 2001: "Beware of carriers false gifts and broken promises”. Confirm that it is Author: Dennis M. F. (Dec. 2017) - (translation from Spanish: S. Gardenteapot Jan. 2018)<sup>12</sup> denounce the actions of (the) same species (s) E.T. in relation to the land military powers?

Answer : " Yes ". To the question: “How to avoid a pact signed in our name. " They answer: “CHARTER OF THE UNITED NATIONS CHAPTER 1 ARTICLE 1§2. Invoke: the threat to self-determination. » The Ummites have given us further details on the worrying possibility of signature of agreements: “No formal agreement can be validated with an institution that is not representative of the nations of OYAGAA. » “A formal agreement would require consensus among:



AR AU BR CA CN CN CO EG ET FR GB IN IQ IR MX PE PH PL RU SA TR UA US VE ZA". Faced with the strangeness caused by this seemingly arbitrary list of countries, they explain: "Principal founding countries of the UN in 1945. List of nations deemed representative in 1954. List confirmed and fixed in 1967". List confirmed and implemented... by whom? No answer. They tell us very clearly, however, that the amoral races, to facilitate the signing this formal agreement, don't care, or wish for a collapse socio-economic of the planet leading to the disappearance of nations in favor of a New World Order (called NWO in English) controlled by the psychopaths of the elite—the very people who are plotting the collapse, and have been promoting for decades the "globalization" which has scandalously increased the power of multinationals and the financial elite on countries and governments, which constitutes a veritable planetary coup in stages—:

To the question: "What participation/responsibility has the amoral race which deals with our power lobbies, in economic collapse? ", the answer is : Indirectly, they [the amoral race(ies)] are eager to find an agreement that would unite all countries under a single new world order notorious. To conclude on this point, it is worth noting this exchange: Question: "Do you always try to get in touch with certain representatives of the earth ? Who, for example? What is their reception? " Oummaine's answer: "The main authorities already know our conditions. Hindered by their own inertia, they mostly refuse them."

**NEGATIVE CONSEQUENCES FOR AMORAL/HOSTILE RACES** In the first series of tweets received, before worrying details about hostile civilizations do not begin to appear, the Ummans informed us generally of the possibility that a BB (Planetary Collective Soul) could take drastic measures against her own humanity if the paths she followed threatened the flow of life. We have grouped the sentences of two tweets: "Viruses [sic] and their mutations are governed by BB. BB can also favor certain conditions to increase or decrease the probability occurrence of phenomena governed by purely physical laws. BB does not act against humanity. It acts globally in favor of Life. He opposes any factor that jeopardizes the dynamic balance resulting millions of years of evolution. » "(...) BB processes all available information during this process filtering/conforming. This information enriches the general reactive mechanisms of BB relating to the global evolution of the middle. Thus, a soul imbued with the strong entropic charge of its destructive memories informs of the destructive potentiality of the entire human race, contrary to the global action of BB. A too strong entropic charge of the souls to be reconformed can therefore cause, by threshold effect, a compensatory action of BB aimed at regulate this entropic potential. BB can then implement regulatory mechanisms directly directed against OEMMII which, globally, affect the homeostasis of the global ecosphere (...)" Later, the following exchange took place: Twitter follower: "When ETs treat another OEMMI race badly, is their BB affects, having regard to the rules in force in the cosmos? » Ummo: BB is informed of their harmfulness. Also for OEMMII cruel to animals, mammals and OEMMII of their own ecosystem. That is to say that BB "condemns" the immoral behavior of his humans, not only towards their fellows, but towards any human being on other planets. Another subscriber then asks: "Don't the amoral races know this? They are supposed to know BB. Not in depth? And the hostiles? ". Answer : Author: Dennis M. F. (Dec. 2017) - (translation from Spanish: S. Gardenteapot Jan. 2018)<sup>14</sup> They obviously know it, suffering from genetic disorders and the dying ecosystems of their home planet. But they can technologically solve it yet. This answer is simply extraordinary. The amoral races suffer from both genetic and planetary degenerations due to their behavior towards the other humanities, and they seem to be aware of it, although they persist in their attitude, being able (for the moment?) to compensate for the consequences. Could there be a relationship between "the dying ecosystems of their home planet" and the "dying planet on which they could no longer survive in the future indeterminate"?

DAVID ICKE, PAUL HELLYER AND THE "ALLIES OF HUMANITY". Very briefly, we will summarize certain sources which —previously— have fact disclosed information very close, at least in some respects, to that provided by the Ummans in the last series of letters and in the aforementioned tweets, and which have been validated by them in an explicit manner, at least in substance or for some parts.

David Icke appears at the beginning of the letters GR1 — much to the astonishment of his recipients; It is revealed that Icke is an “OEMMI O.OUXI BIIAEII” (new expression) which becomes, de facto, a kind of common thread linking the revelations new and transcendent which, little by little, first in the letters then in the tweets, will be done in this new (and critical) phase of contact. Very briefly, David Icke is a kind of modern "prophet" who receives from BB insider information about the state of our humanity, though not all he receives is not sufficiently clear and/or correctly interpreted. We selected some important phrases about him: “(...) we ask you to read or listen in your XAANMOOAYUBAA [computer network = Internet] your brother David Icke which, according to our verifications, is an OEMMI O.OUXI BIIAEII”. “(...) You despised (in general) the character and conduct of DI. You looked at the finger that pointed to the moon. » “It is certain that DI has peppered the subject with metaphors. There was no chromosomal hybridization between your leaders and the “reptilians” (who EXIST and which we call in another manner indicated in previous documents, in which we already added that they do not do not enjoy our respect in any way<sup>5</sup> since they claim organize the future of OYAGAA in a way that is morally repellent to us) [Bold underline exists on the original text]. We, along with two other extraterrestrial species that visit you, would intervene in this crime against humanity only if your planet would be at risk of extinction (probability "relatively low" to date - 16.77« (...) Your brother DI, although of a particular nature, is for basically the same as all of you. So you shouldn't assign it a non-existent thaumaturgical perfection. You have to admit that he makes mistakes and fantasizes like the vast majority of you. (...) Take what DI words are ethically correct, and forget about them. other fantasies or rantings your brother falls into with a certain frequency. "

Finally, in a much later tweet, in response to a question about the nature from the OEMMI O.OUXI BIIAEII, they agree to give a brief definition: OEMMI [male] suffering from Supraliminal Canal Tuning NIA OUXOO6.

Exacerbation of the injunctions of B.B. Raw perception of the Social Network.

Paul Hellyer, Minister of Defense of Canada from 1963 to 1967, almost 94 years old at the time of this writing, surprised his own and strangers a few years ago by proclaiming the reality of secret pacts between extraterrestrials and a sinister clique ("cabal" in English) of members of the ultra-elite who already control almost the planet and who is on the verge of achieving it totally. Currently, Hellyer is a moreover among the many activists of "disclosure". Asked about the Hellyer's statements in a popular youtube video, the Ummans replied to their subscribers the following: We share the assertions of your brother who lightens his own guilt by awakening many consciences.

Marshall Vian Summers is a “contactee/channeled” who claims to have spent thousands of hours, since the 1980s, hearing clearly in his head a voice angelic coming from beings he calls "The Allies of Humanity", who present themselves like some sort of mix between high-level ETs and angels, worried about the fate of our humanity. Among the messages Summers gave in his prolix literary production (on the Internet and on paper), semi-occult, mixed with unbelievable fantasies mixed with New Age touches that abound in his work, are, however, some repeated warnings from the "Allies" who are extraordinarily similar to those launched by the Ummans about the races amoral. In fact, the "spiritual" description of these civilizations, their means and and their purposes, could well be considered an in-depth report and detail that would expand on the brief and limited information

provided by Ummans. Undoubtedly even more surprised than their twitter subscriber having discovered the similarity between the Romanian information and that of the Allies of Humanity about amoral races, the Ummans could only give him the following answer: "We are surprised by this message. We support it, but do not we can guarantee the source. 24 days later, they publish: "We have identified the origin of these messages. We can only partially validate them and wish not to interfere." As for the angelic voices that so impressed Marshall Vian Summers, the Ummites specify: "In this case, the transmission was osteophonic via an implant maxillary organometallic amplifying the vibrations." There does not appear to be any malicious intent on the part of the authors of this "transfer": "It is not, in this case, a mental manipulation, nor a subliminal information infused from BB » And on the sincerity of the recipient and the fidelity of the transcriptions of his messages: "Proven before 2/1998. 2 springs. Extrapolated/interpreted information. Not valid after 8/1999." In other words: the contactee has added contributions "of his own".... The intriguing existence of the "2 sources" (acting on Summers) has not been clarified.

« DISCLOSURE »

The disclosure is understood as the official revelation of the existence of ETs and more particularly alleged contacts and pacts between them and the powers military. The Ummans have been questioned several times about this, but already @oaxiboo6 had bookmarked a tweet from John Podesta: "In the end, my most great failure of 2014: once again, not securing the revelation [disclosure] of UFO archive".

Subsequently, to the question: "What percentage of the elite / secret services, take twitter contact seriously? Has there been a change in attitude since the NR 188 ? », the Ummans respond with this mysterious tweet: Contacts with social media are not only ours. Australia, Brazil and Russia are increasingly considering official disclosure. Here are some other later answers: If a disclosure were to take place, it should be done as soon as possible and in a very gradual way. This confirms that there will not be sudden disclosure, but not ever-widening circles.

This is also why OAY reduces the number of subscribers to its Twitter account every week, by excluding people who do not interact, because as for SESMA, to be in contact with the Ummites one must not necessarily be a great scientist, but you have to love the universe and have variable credulity and know how to show intellectual and spiritual openness. The previous text was accompanied by the following text on a screenshot: Unless disclosure occurs gradually through dissemination towards wider and wider circles, it would not be a remedy for your problems, but a catalyst that would lead to chaos. All the social and economic problems that are underlying today would explode. This would precipitate the fall of the markets due to the total loss of confidence in the governments of the main nations. Religious fanatics would find an ideal pretext to indoctrinate new followers against the infidels who made a pact with satanic creatures. Although perhaps minimized by the hope of a better future, this chaos would certainly be much worse than that which will result from the banking crisis imminent. When asked how to make "progressive" disclosure through of "ever widening circles", the Ummans respond as follows:

The main intelligence agencies Ministers of Defense and Presidency of the most important nations administration they will be notified first while the territorial officers, the press and the people will be informed in a more parsimonious way. THE ROCKEFELLER CASE If many followers of @oyagaa\_ayuyisaa and @oomo\_toa could have some doubts about the identity of members of the pathocratic elite of 0.01%, the David Rockefeller's name was in all bets. Sometimes nothing is what it seems be, but sometimes everything is exactly what it seems... The sinister banker seems to belong to what one might call the club of longtime billionaires. Surprisingly, a series of extraordinarily rich and powerful, widely recognized as psychopaths, criminals against humanity,

war criminals, or all three at the same time, tend reach such advanced ages that it seems they will never die... In 2016, some media reported that D. Rockefeller had successfully undergone his seventh heart transplant at the age of 99. The news was quickly dubbed a false and, of course, has never been picked up by "serious" media (MSM). If it was authentic, the incredible prowess of Rockefeller deserves to appear in the annals of medicine... terrestrial. Rockefeller, however, died on March 20, 2017, at the tender age of 101. the same day, a tweet from @oyagaa\_ayuyisaa appeared with the following text: "Deprived of their makeovers, a good part of your elites senescents will cruelly pay for their lost bet." The tweet quoted one of Rockefeller's (little used) accounts in which he, or someone on his behalf, had written that same March 20 at 10 a.m., "It was magnificent 101 years of life... Unfortunately I will not be there to see the fruits of my NewWorldOrder. I hope my colleagues.. ". [implying "will see them"]. Who provided these "facelifts"? What was the lost bet? The 17th December 2016, this tweet appeared on the @oyagaa\_ayuyisaa account, where it remains A few days : Two elite factions are currently in conflict, one planning the collapse [economic] as soon as possible, the other for April 2021. This is not no longer a forecast but an agenda. Let's remember how a Twitter account works. The identifier of a twitter account (@...) is unique, but not the name of the holder or other data (modifiable at the discretion of the user). Apocryphal accounts are appeared one fine day imitating the style of the original Umman accounts and using the same name, same profile picture, etc. It is probably for these reasons that @oyagaa\_ayuyisaa and @oomo\_toa changed their profile picture, which was originally in both cases one of the photographs of the famous nave of San José de Valderas. (He should be noted, moreover, that a change of profile picture is automatically applied to all tweets posted on the account, regardless of their date). There are had other occasional changes in the title and color image of the "theme" @oyagaa\_ayuyisaa and @oomo\_toa accounts, as well as appearances and disappearances of various accompanying texts in the profile pictures. In short, we wish to warn against the presence or possible appearance fake accounts, insisting that the only validated accounts are @oyagaa\_ayuyisaa and @oomo\_toa. For several years, the Ummites, including OAY, have predicted a world economic collapse which has caused a lot of noise, which has fueled survivalists and all those who follow Ummite tweets from near or far. This collapse should have taken place in April 2021 according to OAY, or at the latest in 2022. We see that there was no global economic crash; despite global CORONAVIRUS outbreak. Ummites accounts are restricted which means they choose people who have the right to follow them, if they don't accept you, you can't follow them. OAY writes on twitter: « Awareness of the reality that your social network is manipulated for the interests of a few excessively wealthy psychopaths has increased massively. This Twitter experiment having achieved its objectives, the current effervescence and the content of certain comments oblige us to stop it. »+( »

He wrote in 2015 on twitter, so well in advance:

« The probability of the occurrence of the economic collapse is 8% before July 2019, 50% before April 2021 and 92% before December 2022 ». The Twitter experiment is believed to have started in 2015, a year after the death of their puppet José Luis Jordán Peña to test the credulity of people in front of the announcement of the officialization on the Internet of the presence of extraterrestrials on Earth, and ultimately unlock restricted access to OAY's account in front of the public. urgency of the situation linked to the imminence of the crash and its millions of deaths, in France alone, with the aim of starting to widen the circles, because before the unlocking OAY had only 70 followers (including Stonegardenteapot, screenwriter, director and writer, who has been working on the UMMO file for 20 years and who has a relationship with them) on Twitter, and one week there were 5,000. This story of economic collapse was a pretext to expand the number of Earth humans having the possibility of communicating with them on Twitter and making statistics on reliable,

gullible, sincere people and seeing their behavior. In addition, we find the germ of self-destruction that Jimmy Guieu told us about the ADAMSKI affair in the 50s because obviously, the economic crash not taking place, the Ummites, are discredited and their extra-terrestrial origin is ridiculed. The general public is so conditioned by 70 years of lies that it takes everything in its stride, the tabloids exaggerate the UFO phenomenon, they do a reverse censorship, it is their way of reducing to absurdity. The press only talks about UFOs as a joke.

But, in 2020, the number of UFO reports has literally exploded in several parts of the world. In the U.S., people are waking up and under their pressure, the U.S. Navy has released videos of "unidentified aerial phenomena." The perfect time for The Black Vault website to finally release more than 2,700 documents declassified by the CIA.

While more than 2 million people want to force their way into Area 51 in the United States this weekend, the U.S. Navy officially confirmed on September 10 the authenticity of three videos showing unidentified flying objects. These videos, acquired in flight by U.S. pilots had been made public by the TTSA (To The Stars Academy) UFO research organization of Tom DeLonge, former lead singer of Blink-182. In November 2014 and January 2015, off the coasts of San Diego and Jacksonville, U.S. Navy pilots aboard fighter jets were confronted by unidentified flying objects on several occasions performing maneuvers incompatible with the performance of all known flying machines (accelerations, sudden stops, instantaneous turns).

The recordings made during these flights clearly show the presence of flying structures moving at very high speeds and one can hear the astonishment and surprise of the pilots in front of these objects with unimaginable performances, and especially their incapacity to determine their origin. These recordings were made public two years later by TTSA (To The Stars Academy), the UFO research organization of Tom DeLonge, former singer of Blink-182. They were also covered by the U.S. media. At the time, the U.S. Navy was talking about drones and balloons (certainly a more modern version of the Roswell weather balloon!) to explain their presence.

Under the U.S. Freedom of Information Act, the U.S. Navy and the Pentagon have been forced to make public eight reports of incidents between its pilots and unidentified aerial phenomena. No flying saucers, but for one of the world's most closely guarded airspaces, the existence of these recurring unidentified aerial phenomena is a major concern.

In the United States, the Freedom of Information Act of 1966 requires federal agencies and the armed forces to declassify and release their documents to any American citizen who requests them. However, this freedom is restricted by various criteria, including endangering national security, to prevent the release of these documents. In reality, obtaining sensitive documents requires a lot of patience, as the request is a long and arduous process.

But, by dint of perseverance, American citizens have forced the Department of Defense to make public numerous files, including photos and videos that deal with unidentified aerial phenomena, more commonly known as UFOs. Obviously, these documents do not necessarily refer to extraterrestrials. Only a few days after the Pentagon declassified three U.S. Navy videos, the Navy released eight reports of its pilots' encounters with unidentified aerial phenomena in mid-air on the U.S. East Coast. Of the eight reports made public seven of them involve F / A-18E / F Super Hornets and occurred at different times between 2013 and 2014 off the coasts of Virginia and North Carolina. The eighth incident occurred in 2019 and involved a Boeing EA-18G Growler electronic warfare aircraft flying off the Maryland coast.

Unsurprisingly, none of his eight reports, available on numerous websites, point to the existence of flying saucers or any extraterrestrial technology. That said, the existence of unexplained aerial phenomena to this day is still a matter of concern within the U.S. government and a much greater

national security concern for the U.S. Air Force, which is responsible for U.S. air defense.

The Pentagon has declassified three videos from the U.S. Navy, already made public, showing what seems to be unidentified flying objects. An initiative that does not correspond to any logic, except to remind everyone of the existence of aerial phenomena that are still unexplainable!

The Pentagon released on April 27, 2020 three videos from the U.S. Navy that had been made public in September 2019 by Tom DeLonge's UFO research organization TTSA (To The Stars Academy). These videos, all acquired by U.S. Navy pilots in flight, showed them confronting unidentified flying objects, on several occasions, performing maneuvers incompatible with the performance of all known flying machines (accelerations, sudden stops, instantaneous turns).

At the time, the U.S. Navy was compelled by a U.S. Freedom of Information Act to explain these videos. On September 10, 2019, its spokesman, Joseph Gradisher, admitted that the "phenomenon shown in these videos is unidentified" and acknowledged that they are "unknown objects violating U.S. airspace." But, rather than talking about unidentified flying objects (UFOs), the U.S. Navy preferred to use the less polemical term "unidentified aerial phenomena."

Today, the Pentagon justifies its "transparency" initiative to cut through "all the misconceptions that are circulating about UFOs," explains Pentagon spokesperson Sue Gough. Like the U.S. Navy, after investigation **the Pentagon recognized that the aerial phenomena seen on these images were classified as unidentified**. One wonders how it would have been possible to explain them differently without admitting the existence of a technology superior to the American military capabilities! "After careful analysis, we have determined that the authorized sharing of these videos does not reveal any sensitive systems or capabilities and has no effect on possible future investigations into incursions of unidentified aerial phenomena into military airspace," concludes Sue Gough.

FLIR1 is the second of three U.S military declassified videos. It is the only official footage that has been released that was taken during the 2004 NIMITZ incident and has chain of custody documentation to ensure preservation of its original condition. Taken aboard a US NAVY F/A 18 SUPER HORNET, the unaltered footage was captured by a raytheon advanced targeting forward-looking infrared (ATFLIR) POD which contains the most advanced sensors and powerfull tracking systems on the market.

Constrained by the American Freedom of Information Act, the U.S. Navy had to provide more convincing and serious explanations. On September 10, its spokesperson, Joseph Gradisher, admitted that the "phenomena shown in these videos is not identified" and acknowledged that they are "unknown objects violating American airspace." But, rather than talking about unidentified flying objects (UFOs), the US Navy preferred to use the less controversial terms of «Unidentified Aerial Phenomena».

This announcement pleasantly surprised the world's UFO community, welcoming the U.S. Navy's statement, effectively breaking with the official position of the U.S. government that never wanted to recognize such "phenomena" using such precise terms used by the U.S. Navy.

That said, while the images were first officially released, they do not indicate any extraterrestrial origin. Indeed, these objects can also evoke highly advanced military drones that a priori would not be American.

This declassification follows a petition, launched on February 10, 2022 on the Change.org website, calling on several American senators, including former presidential candidate Marco Rubio, to reveal to the general public documents that could attest to the UFO sighting. The request is particularly aimed at the Unidentified Aerial Phenomena Task Force (UAP, or "Task Force for Unidentified

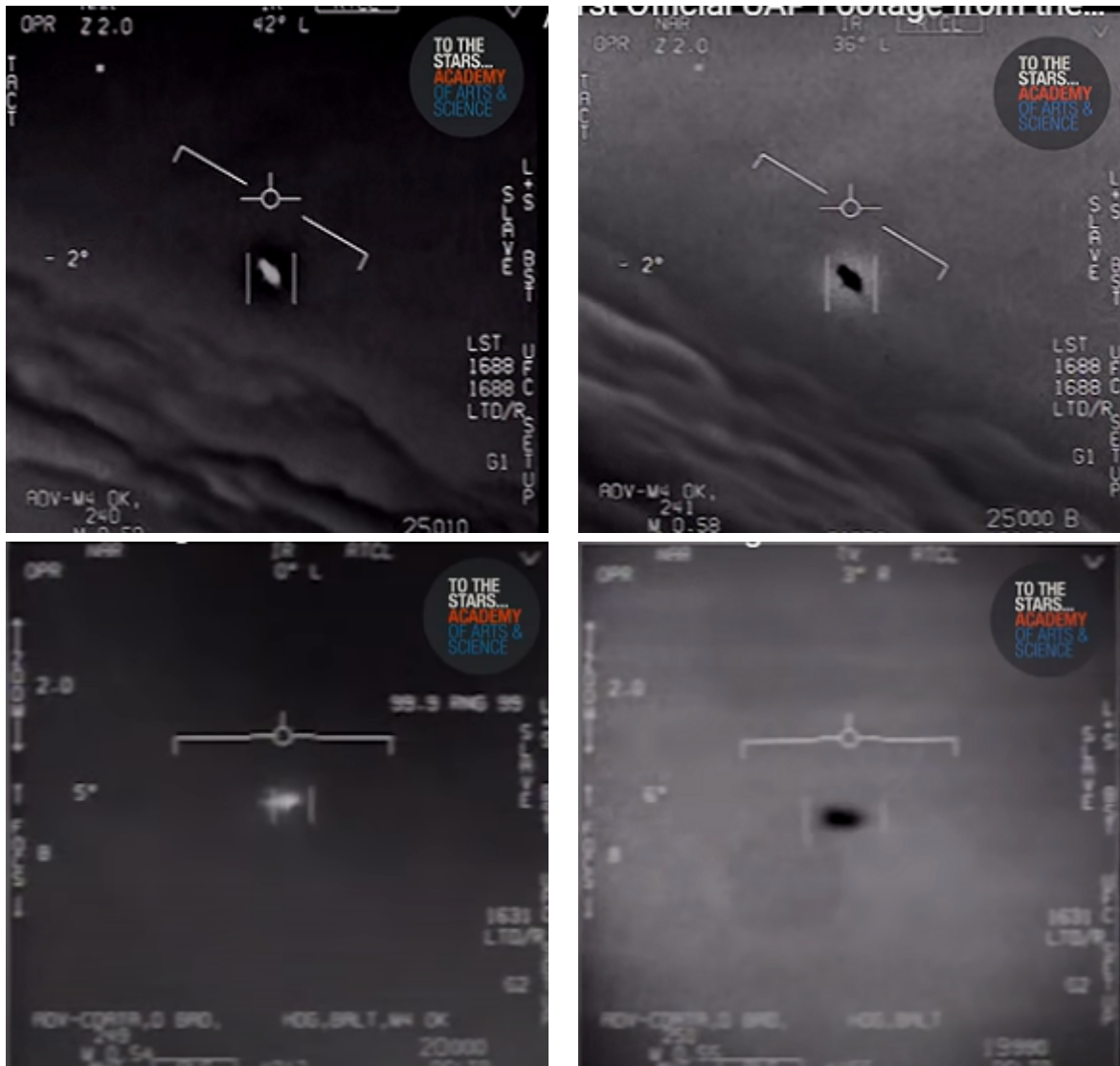


FIGURE 54: FLIR1 IS THE SECOND OF THREE U.S. MILITARY VIDEOS OF AN UNIDENTIFIED AERIAL PHENOMENON (UAP) THAT HAS BEEN THROUGH THE OFFICIAL USG DECLASSIFICATION REVIEW PROCESS AND APPROVED FOR PUBLIC RELEASE.

Aerial Phenomena”), a government program monitoring such phenomena. The organization had notably published a report on videos made public in 2021 concerning the overflight of a United States warship by UFOs, the authenticity of which had been validated by the Pentagon.

According to Space.com, the instigator of the petition, Adam Goldsack, is of British origin. But this request is rooted in the purest tradition of observing and recording unidentified aerial phenomena in the United States. In 2020, the three videos filmed by the US Navy were revealed to the general public; nicknamed Flir (4 images extracted on FIGURE 54), Gofast and Gimbal, they caused a stir on social networks. We discover the flight of aircraft with unusual shapes with the indecisive and surprised comments of the pilots facing these phenomena. Many politicians feared that two warships, the USS Omaha and the USS Russell, would be overflowed by a new kind of spy plane.

We can obviously make the link with the Ummite presence on Earth and especially the form on the video that corresponds to the Ummite spaceship in the shape of a disk and the Ummite surveillance that infiltrated NATO and the CIA and that is still under observation on the American maneuvers but we will come back to this later. This declassification means that the US government knows that the formalization of the extraterrestrial presence on Earth is near (10 or 20 years), and Ummites tweets have played a role in awakening the population who, at least in the United States is no longer conditioned by the serious press or tabloids. We saw it with Trump’s victory in 2016, which won the US presidential election against almost all the media and against the polls that lied on that occasion. 30 years ago, at the time of Jimmy GUEU, there was no Internet, so the Ummites could not test the reaction of the masses to the alien announcement, which is another level than testing the credulity of a small esoteric group of UFO enthusiasts in Spain, countries that have now caught up with other European countries. It no longer has the reputation of a backward country as it did in the 1970s. The Ummites know that things must not go too fast, so they preferred to draw attention with this announcement of a global economic collapse unrelated to the Coronavirus epidemic. All this was calculated in advance because even if there had been an economic collapse, the US and Europe would have taken measures, as the leaders did following the war in Ukraine that began at the beginning of the year 2022, which was planned by US intelligence agencies. If an economic collapse were foreseen, the leaders of the richest countries, including Vladimir Putin and Joe Biden, would have been warned by their experts in the world economy and would have reacted very quickly. The CIA, the FSB and even the European services would have been aware of this between allied countries via NATO on the one hand and China/Russia on the other, so this collapse would not have taken place anyway because this small group of individuals would have been quickly neutralized by the intelligence services like the CIA. So this warning from the Ummites was only a smoke screen to warn the Earth race that the wealth is very badly distributed and that the economy is sick and that the politicians are corrupt and foreignly linked to the Rothschild bank like Emmanuel Macron for example. To evacuate the extraterrestrial hypothesis, some officials said that it could be revolutionary Russian weapons, because all means are good to smoke out the people on the question of UFOs, the successors of the Majestic 12 to follow their dirty work but with these videos and undoubtedly under the pressure of Ummite tweets combined with the increase in the number of UFO sightings since 2020, the Pentagon has stopped behaving like a great mute, the Ummites have supported the secret defense. Technological advances, notably in infrared sensors and military surveillance imagery, have overcome the secrecy of the external origin of these craft. The objective of this Ummite announcement on Twitter is to measure the speed of propagation of information and its influence on the masses and moreover they had told Raphael Farriols that they were not there to change anything would be rather a destruction, they had told him that they would go back and that everything would remain as it was. But in fact their strategy can be



deciphered quite easily: it is to wait for technologies to progress, and reach that of the 2 amoral races AM1 and AM2 in order to be able to organize a transfer of technology which will allow terrestrial humanity to travel between the stars using the varying folds of space-time with the most powerful armies in the world. Already it is necessary to be able to identify when the passage between the stars is optimal, but only the advice of the extraterrestrials will make it possible to know how to build these spatialships and to organize the food during the trip which lasts 6 months when the isodynamic conditions of space are favorable to such a trip, ie when the sheet or the sheet of paper is sufficiently pleated. We must never forget what Jimmy Guieu had said: When Earthlings know that extraterrestrials are on Earth, « it will be a moral Hiroshima in their brains ». The Ummites know what they can destroy, they are waiting for the technologies to be sufficiently advanced so that the construction of this ship and all the associated prerogatives can be done without too much difficulty for the engineers who will undoubtedly have to be trained. Indeed, for the Ummites 1987, my year of birth is the Middle Ages, and if today's engineers traveled to the Middle Ages in the past, how would they manage to obtain the integrated circuit elements of modern computing, electronic components, artificial intelligence, embedded systems? The factories, the training of engineers, the differences in means of communication? Imagine the complexity. But we are leaving the Middle Ages in 2020, that's why UFOs show themselves more and more voluntarily because they want to be seen in the sky. Why? because they know that information sensors and digital imaging techniques are no longer those of the 1990s or 2000s; and therefore, engineers and researchers of military imagery and satellites are able to distinguish machines with unnatural, intelligent behavior and not built by foreign powers. For example, Russia is ahead in the field of hypersonic missiles, but no nation in the world is able to build vessels whose trajectory is reminiscent of brutal changes of axis and whose shape is that of saucers. flying very flattened like two plates superimposed in opposite directions. These ships behave like ping pong balls, their operating energy is based on antigravity and negative mass, so on the one hand they don't make noise, and on the other hand their trajectories are erratic, like the angle beam illustrated in the chapter on the structure of the universe and the non-existence of black holes. Their energy is internal to the twin structure of the cosmos and to the jumps of a particle of an atom towards another particle of another atom, it is not external; this is also why OYAGAA AYOY YISSAA specifies on your simple but direct: « Your gear, we don't give a shit ». As we have seen previously for terrestrial scientists, an electron is both a wave and a corpuscle having a mass whereas the photon is a wave which is never at rest so it is not a particle of matter, but this confusion is naïve because in fact mass at the quantum and macroscopic level is the deformation of space by standing sinusoidal waves (GOD). So in fact an electron is a wave and only an electromagnetic wave like the photon. It is therefore possible to exploit these angular jumps of subatomic particles to travel at a non-negligible speed compared to the speed of light. By adjusting the internal axes in the electrons, we change the corresponding internal angles in order to simulate the behavior of a quantum of light. This is the basis of long-distance interplanetary travel. If the axis rotates through an angle  $\pi$ , the mass is reversed because  $\sin(\theta+\pi)=-\sin(\theta)$ ; We pass into the twin universe of negative mass and we benefit from a shorter angular distance (abuse of terrestrial language because a distance is always angular), on the other hand we can align ourselves with the characteristics of the photon which does not have mass by adjusting the angles of the subatomic particles (like the electron) so that they are all in phase with each other with respect to the quantum of light, which would make it possible to go to a third of the celerity of light in the empty. A report published in 2021 by the UAP Task Force validated the veracity of the videos with the support of the Pentagon and the US Navy. In June, the monitoring body declared that between 2004 and 2021, nearly 143 aerial

phenomena observed remained, to date, unidentified. Adam Goldsack then launched his petition at the beginning of February 2022, calling for "civilians to be able to investigate", arguing about a scientific aspect to this "participatory" approach. So far, Goldsack's petition has garnered nearly 3,660 signatures, more than double the originally requested amount of 1,500 pledges. But radio silence on the side of the UAP which has still not reacted to the requests (perhaps too optimistic?) of the Briton at the origin of these declassifications by the Pentagon. On YouTube, there is thus an incalculable quantity of more or less well faked videos, which have fueled heated debates in the comment sections of the platform. But some stories and documents took on an aura of credibility, so much so that the subject of UFOs ended up spilling over into the program of the candidates for the presidency of the United States in 2016. Hillary Clinton declared on the set talk show hosted by Jimmy Kimmel being a "UFO enthusiast" and wanting to open a research department dedicated to these phenomena, like the television series X-Files. During his mandate, Donald Trump also maintained the mystery around unidentified flying objects, and declared in 2020 that he wanted to declassify the file concerning the Roswell incident. But the US military has never explained why these devices have a saucer shape, like the superposition of two upside-down plates on top of each other. The frisbee spins on itself, it stabilizes on a plane of rotation like a top, which allows it to remain stable during its flight. And the faster the frisbee spins, the more stable it is. The suspension related to the aerodynamic effect is exerted especially in front of an object moving in the air. The penetration in the air is facilitated by the shape of the Frisbee, and for the flying saucer, it is a bit the same thing, the penetration of the ship in a universe of negative mass which is similar to the resistance of the air, is improved by the same effect. It is the rotation of the flying saucer in the counter-clockwise direction that generates the anti-gravitational effect in the sky and the flattened oval disc shape combined with the rotation that makes it possible to reduce the effect of friction negative matter on the walls of the spacecraft during the few months' journey through the negative-mass universe. This is why we can speak of the "frisbee effect". A Frisbee does not weigh much because otherwise the air penetration would be too small, which is why alien spaceships are small and their occupants are packed like sardines inside. The ship must support its own negative mass on the one hand and must support its brutal axis changes (change of three-dimensional frame of reference), therefore its mass must be reduced. It is easier to build a low-mass anti-gravity object because the angular inversion of subatomic particles is easier to achieve. The frisbee penetrates like a sharp disk through the anti-universe where all particles are charged in the opposite way to what we know in our universe. The shapes of recorded UFOs coincide exactly with the shape of the Ummite spacecraft, which is presented in FIGURE 54A, by zooming in on the shape and adjusting the rotation to  $45^\circ$ . The spaceship has this shape because it has a reduced ballistic coefficient so that penetration in a viscous fluid is optimized. The ship is floating inside a very strong magnetic field. The ship floats inside a very powerful magnetic field, this is what generates anti-gravity, the ship floats because this magnetic field is so intense that the object is no longer subjected to gravitational force, it is anylhée by the magnetic fields. The three-dimensional frame shift (passing to another universe of negative mass) is done by reversing the mass of the spacecraft, changing the phases of the subatomic particles. The movement of the ship in this environment of negative matter (analogous to a viscous fluid) is done by adjusting the properties of the subatomic particles to those of a quantum of light (PHOTON). Photons were originally described by Einstein based on their interaction with electrons. Indeed, it was while trying to explain the photoelectric effect that Einstein put forward the hypothesis of "quanta of energy" constituting light. The photoelectric effect is related to the integration between a photon and an electron. The photon will neither be accelerated nor slowed down by a gravity field; this

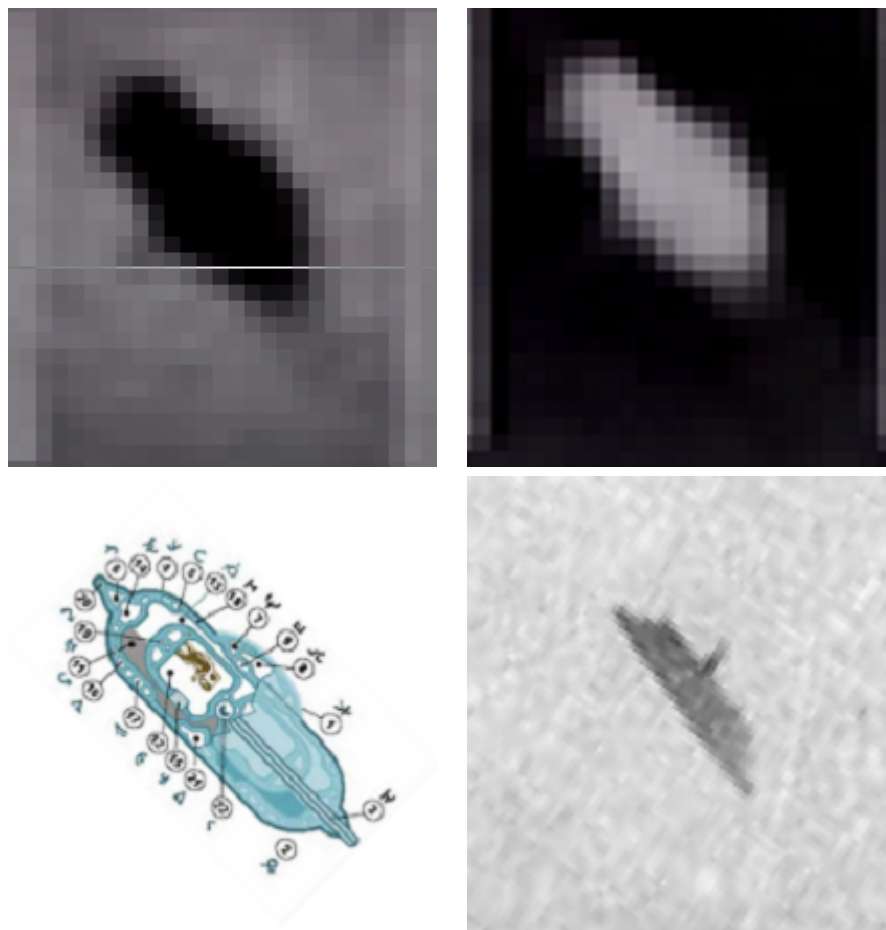


FIGURE 54A: Comparison between the shape of the Ummite craft and the zooms of the flying saucer sightings

one will modify its energy but not its speed. The propulsion is probably done by using a lithium plasma varying at very high frequency which allows to include the electrons in a field of photons and thus to reach speeds which are a non-negligible fraction compared to the speed of light. When we read the postulate of terrestrial scientists: "We can distinguish two types of substance in the universe: matter, which has mass, and light, of zero mass. Light can propagate in a vacuum, always at the same speed", we understand that this error is a serious, naive and childish confusion of Earth scientists who have not understood that the photon has no mass because the mass is a deformation of space-time generated by a sine wave, so the mass is a geometric deformation (in 4 dimensions according to EINSTEIN and 10 dimensions in truth) caused by a sinusoid, so the electron sees its electrical charge reversed when its mass is reversed, so it becomes a positive electron during the trip to the twin universe. By exploiting the intimate relationship of PHOTON-ELECTRON interactions, the plasma varying at very high frequency allows subatomic particles to be driven by the speed of the Photons which surround it.

We can think that these videos confirm that the Ummites and/or their more advanced brothers still follow today the military operations of the most important countries, in the first place the USA. There have been agreements in TRUMAN and the greys, a small extra-terrestrial species which we have given the robot portrait of previously, which explains why in the United States, there are many more kidnappings and mutilations of cattle than in Europe. It is the MAJESTIC 12, an ultra-secret and all-powerful organization created under TRUMAN) which was the interface between the American officials and the extra-terrestrial race, it was composed of 12 scientists and soldiers at the top of the hierarchy. Robert HASTINGS, a photography expert in the USA, had moreover told Jimmy GUIEU that since 1947, the American government has classified information concerning UFOs as top secret. It can be said that since 1953, the CIA sensed that this problem concerned national security and took over from the US AIR FORCE for the coordination of research on UFOs. A large number of documents dating from the 1940s, 1960s and 1970s report UFOs maneuvering around nuclear installations such as silos, nuclear weapons development centers or even around nuclear weapons depots. The personnel of these installations describe objects in the shape of discs or saucers which made no noise and which sometimes revolved around the silo at an altitude of barely 60 meters. Fighter jets were launched from a base in Montana to intercept these objects after they were seen over silos in November 1975. The documents describe in great detail the coming of these craft night after night. for two weeks above strategic installations in this part of the USA.

In a series of letters, the Ummites succinctly describe their ship without revealing the slightest technological secret.

The title of the letter is: "Les atronefs d'Oummo" Date: June 1968 Recipients: Mr. Villagrasa Original language: Spanish Notes: This is a very long document of 41 pages including many drawings and symbols.

The notes (framed in green) are as important (if not more) than the text itself, so that's why we integrated them into the text, as well as the images that were located at the end of the original document. Some images therefore appear several times, since they are cited several times in the document.

This document is divided into five parts (from D69-1 to D69-5). The footer links allow you to follow the reading.

The distribution of the chapters in the pages is as follows: 69-1: Introduction / Exploded view and details of UEWA / Structure of UEWA / ENNAOEII - Note 6 / Systems and equipment - Notes 1 and 2 69-2: Propulsion / Particle inversion / Crew enclosure / OEE phase / AGOIA phase

69-3: XOODOU structural coating - Note 15, 3 - 4 - 7 - 19 69-4: UAXOO AXOO / Sidereal and atmospheric navigation - Notes 5 - 10 -11 69-5: Explanations concerning the apparent behavior of UFOs / Disappearance of the craft / Sudden changes in speed - Note 12 / End of the letter Notes 8, 9, 13, 14, 16 and 17 are missing or later censored by the Oummans.

UMMOAELEWE This is a copy I made of an original that I keep in my possession. Language: Spanish No. of copies: 1 original, but I made several I deleted the name of the correspondent Sir:

During the telephone conversation we had last night, you were asking me for clarification on certain concepts concerning our OAWOOLEA UEWA OEMM (SPACESHIPS). I will try to satisfy your natural curiosity up to the limits allowed and in the restricted space of typed sheets, while warning you that this summary report has only a purely descriptive character.

But first let me apologize for not being able to give you the names you're asking for. Your repeated insistence last night was painful to me, but security reasons for our small community of brother explorers of this OYAA (Cold Star) push us to adopt certain forms of conduct that may appear to you to be extreme and even absurd and inconsequential, but which - do not doubt it - are part of our strategy in relation to the Terrestrial Social Network.

The interruptions you notice during telephone communication are not due to simple disconnections. They are the inevitable consequence (technically, easily explainable) of the emerging process that we are obliged to adopt to establish abnormal leads with your telephone circuits. These setbacks can only be neutralized when the telephone exchange is equipped with a transistorized communication system or possibly with cross-bar (pentaconta) equipment or similar techniques.

#### STRUCTURE OF OUR UEWA OEMM

A sketch of our vessels drawn with coloured pencils will roughly explain their essential morphology. You will understand, Mr. &&&&&&& that you cannot be given a complete or complete description of its structural design, the design propulsion system, IBOZOO UU inversion technology, control systems, etc... The descriptive diagrams and graphs we send you are sufficiently sanitized and abbreviated so that their possible disclosure is free of risk. All information of a truly scientific type, which could be used in revolutionizing Earth Science and Technology (with the distortion that this would imply for normal evolution) has been carefully censored. I have endeavoured, without exception, in the diagrams I enclose, to assign figures corresponding to numerical characters that are familiar to you. Thus, I have tried to restrict the inclusion of Aboriginal phonemes of a technical character to the maximum by replacing them with their earthly equivalent, for arbitrary and not very faithful. Only those components which, in our opinion, are the most characteristic are associated in this description with the original word.

The (IMAGE 1/FIGURE 55) shows, in its basic sketch, a frontal section of the structure of a UEWA.

Here is the description of the elements of the ship:

1. ENNOI Protuberance, turret or cupola located in the upper hemisphere of the UEWA OEMM (ITS MEMBRANE is transparent).
2. ENNAEOI Central body of the ship's superstructure
3. DUII Ring or equatorial crown that surrounds the UEWA.
4. AAXOO XAIUU AYII Magnetic field generator toroid.

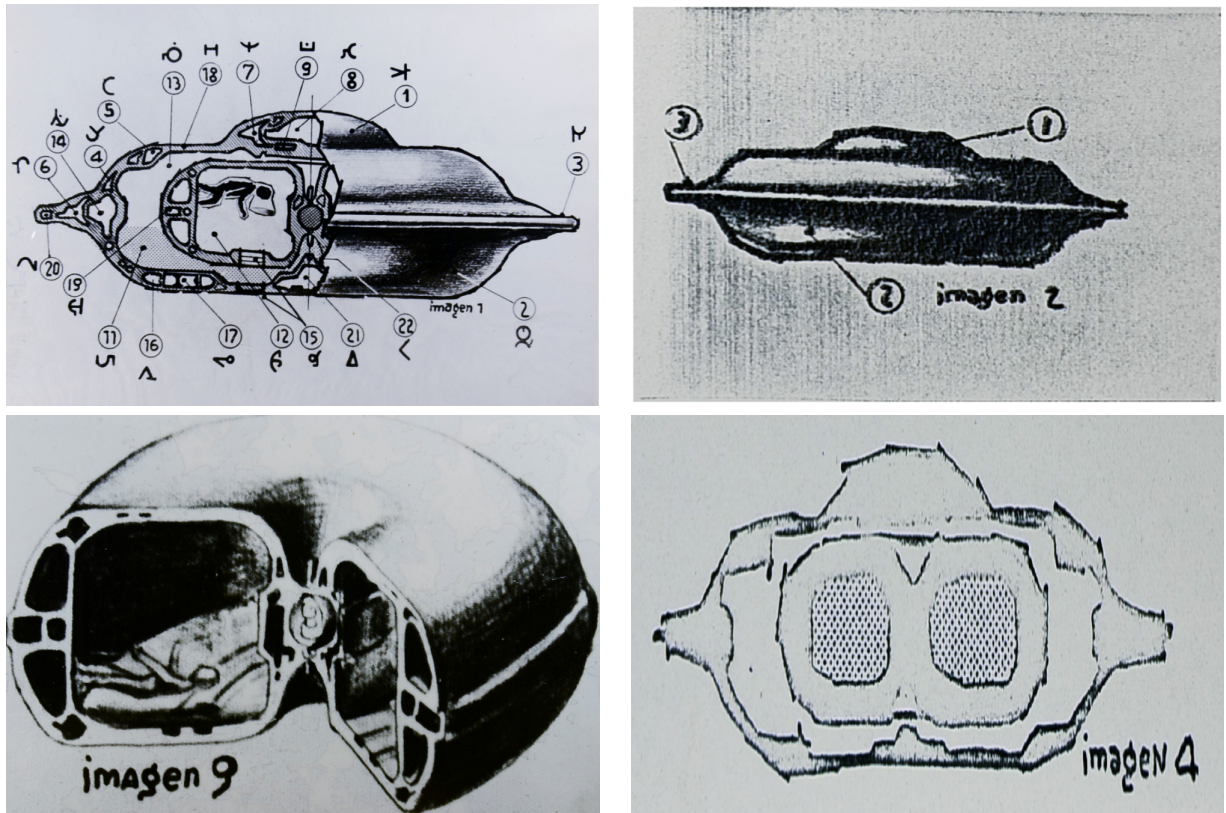


FIGURE 55: frontal sectional structure of a UEWA (UMMITE SHIP)

5. NUUYAA Toroidal tanks of hydrogen peroxide and molten lithium.
6. IDU UWII AYII Propulsion equipment located in a ring-shaped enclosure embedded in the DUII.
7. Power generator. Transforms the mass of lithium and bismuth into energy, after its transformation into plasma.
8. IBOZOOAIDAA Central control equipment for reversing IBOZOO UU.
9. XANMOO Autonomous peripheral computers (The central XANMOO is located at the geometric center of the 12 AYIYAA OAYUU (central sphere in image 1))
10. Censored in copy.
11. TAXEE jelly or gelatinous mass (occupying the interior of the AYIYAA OAYUU 12 in use).
12. AAYIYAA OAYUU Floating cabin.
13. YAAXAIU can be translated as "MAGNETIC CAVITY".
14. This toroidal structure encompasses many of UEWA's facilities. Part of the magnetic field generator, the control organs for the XOODINAA, the feed tanks and transported mobile equipment, the equipment for the manufacture of accessories, etc.
15. IMMAA some of the access hatches.
16. YAA OOXEE (MERCURY RESERVOIR)
17. Complex annular enclosure which is located among other elements, emergent feet, element transmuters, etc.
18. XOODINAA membrane, bark, outer wall or cuirass protecting the UEWA. It is opaque and of great structural complexity, except for the ENNOI, which is transparent and homogeneous.
- 19.
20. YUUXIIO Toroidal equipment for gas environment control.
21. UAXOO AAXOO transmission and detection centre, shielded.
22. ENNOI AGIOA cupola or assembly cone. Can dissolve or regenerate under control of central xanmoo.

An outside observer will distinguish three clearly differentiated parts: (IMAGE 2) The ENNAEOI (CENTRAL BODY OF THE SUPERSTRUCTURE) The ENNOI (KIND OF TOWER OR DOME) and DUII (Annular wing located on the equatorial plane of the main structure).

The profile of our UEWAs does not lead to the adoption of shapes which, for land aeronautical technology, show a high ballistic coefficient (ogival shapes, etc.) and whose finesse is necessary to reach high speeds within a fluid viscous. This is because our movement technique is radically different from the embryonic methods used on planet Earth:

- The displacement on a very extended trajectory is carried out in a three-dimensional framework distinct from that which is familiar to us in the WAAM (COSMOS).
- Our basic propulsion, in addition to being different from those known to you, enjoys a higher energy capacity than that provided for in your future space programs.
- As we will tell you later, the problems posed by the boundary layer of the fluid are solved with special techniques.

THE ENNAOEII (central body in the image 2)

The central core of the UEWA (ENNAOEI) is a structure of cylindrical configuration. Inside (central cavity: IMAGE 1: 13) we find the AYIYAA 12 (its correct translation would be "FLOATING TOROID"). This second structure is a large toroid-type cabin (IMAGE 9) capable, within restricted limits, of moving inside the hollow enclosure (n°13) of the ENNAEOII (IMAGE 4).

When the vessel takes off or when it arrives near the fixed objective, and in general when it is foreseen during its route (trajectory) of strong accelerations (sudden changes of speed or direction) the AYIYAA floats within the YAAXAIUU (MAGNETIC CAVITY 13), that is to say, inside a magnetic field of high frequency and very energetic (Frequency: 3,26.104 cycle / second). During the phase called OEE (PICTURE 4), which means "SUSPENSION or FLOATING", the CABIN has a programmed autonomy and its relative movements are subordinated to sudden changes of dynamic type, as we will indicate later. The cavity between the AYIYAA and the ENNAEOI contains a mixture formed by some isotopes of Argon and Oxygen at high pressure. The colored mass of a screen of GREEN dots (IMAGE 4) corresponds to a gelatinous mass which, during this OEE phase fills the AYIYAA cabin, protecting the bodies of the members of the crew and the remainder of the mobile equipment of the voyage (SEE NOTE 6 IN APPENDIX).

NOTE N°6

The EEWEANIXOO is what you would call a "SCAPHANDER" or CLOTHING. In reality this protection is gradually being replaced by others with different characteristics for certain flight conditions. The EEWEANIXOO OOE is precisely used during the phase in which the AYIYAA OAYU (IMAGE 1 12) or TOROIDAL CABIN is filled with a GEL that we call DAXEE. This gelatinous mass, apart from other functions, acts as a shock absorber during the acceleration or deceleration procedures of the UEWA.

The travelling OEMII is thus embedded within this viscous mass, directly isolated from its brothers and subjected to the dynamics of accelerations which sometimes exceeded 245 meters/s<sup>2</sup> (although these peaks of accelerations last few fractions of UIW).

The description of these "CLOTHES" as well as of the BIEWIGUU AGOYEE system (PSYCHIC AND PHYSIOLOGIC-BIOLOGICAL CONTROL) would require as many pages as this document. To summarize, the EEWE (CLOTHING) is a complex membrane that peripherally surrounds the traveler's body without its surface making any contact with the epidermis of the OEMII (HUMAN BODY). The whole is located in the gelatinous mass in such a way that when an acceleration in a certain direction occurs, the gel substance liquefies in the environment, and the traveler's body adopts, with the help of the outside, a posture that makes the effects minimal. The space that separates the internal surface of the EEWEANIXOO OOE from the human skin, is rigorously controlled according to the degree of capillary vasodilatation of the epidermis and the transpiration of the same. In this way, the metabolic heat of the body adopts the normal values in the usual conditions of flight. Pressure, carbon dioxide absorption, regulation of nitrogen, oxygen, water vapor and other components of the internal constituents, are self-regulated according to the information



offered by the sensors that control at any moment the metabolic and physiological activities of the respiratory, circulatory and epidermal apparatus. The physiological control equipment has been equipped with non-invasive transducer probes that check almost all the organic functions, inside the organic tissues, without the introduction of such xxxxx (I am not sure if he said UAXUOETY or OAXUOETT. This note is typewritten) is necessary. From the muscular activity and the evaluation of the levels of glycogen and lactic acid, to the complex control of the neurocortical activity that provides precise data on the psychic state of the subject, the whole range of the biological dynamisms is recorded and provides this informative current through about 2.16.106 informative channels to a XANMOO that, after having compared them with standard models, "dictates" the effectual or motor responses to the organs of the BIEWIGUU AGOIEE.

Feeding is done by the introduction of paste by mouth. Some foods and water are introduced in the form of capsules with a tasteless wrapper that dissolves on contact with saliva. The thermal gradient varies in the different peripheral zones of the enclosure. The sensation that we experience during the OOE phase during the intervals when the acceleration is nil or moderate, can be defined as a peaceful sensation of floating in a mattress of warm air. One hardly feels the vestibular effects caused by the rotation of the AYYIYAA OAYUU to create an artificial gravity, thanks to the introduction near the membranous labyrinth of two control devices through a simple surgical operation (two needle-like implants are introduced without damaging the tissues or the arterial and neural network).

The enclosure that separates the epidermis from the EEWE undergoes, at the level of the face, a truncated cone-shaped enlargement. The base of such a trunk surrounding from the eye to a distance of 23 centimeters, with an angle of  $130^\circ$  sexagesimal, represents a screen provided on its surface of about 16.107 excitable centers able to diffuse each one, with various levels of intensity, all the electromagnetic spectrum between 3,9.1014 and 7,98.1014 cycles/second. The definition of the images obtained is sufficiently high that both eyes cannot distinguish between normal visual perceptions and those artificially generated by this organ. The binocular vision is realized thanks to the prismatic arrangement of each emitting center. The excitation of opposite faces, so that one of the two eyes does not have access to the image of the other, is realized in a very complex way (PICTURE A).

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degree of capillary vasodilatation of the epidermis and the transpiration of the same. In this way, the metabolic heat of the body adopts the normal values in the usual conditions of flight. Pressure, carbon dioxide absorption, regulation of nitrogen, oxygen, water vapor and other components of the internal constituents, are self-regulated according to the information offered by the sensors that control at any moment the metabolic and physiological activities of the respiratory, circulatory and epidermal apparatus. The physiological control equipment has been equipped with non-invasive transducer probes that check almost all the organic functions, inside the organic tissues, without the introduction of such xxxxx (I am not sure if he said UAXUOETY or OAXUOETT. This note is typewritten) is necessary. From the muscular activity and the evaluation of the levels of glycogen and lactic acid, to the complex control of the neurocortical activity that provides precise data on the psychic state of the subject, the whole range of the biological dynamisms is recorded and provides this informative current through about 2.16.106 informative channels to a XANMOO that, after having compared them with standard models, "dictates" the effectual or motor responses to the organs of the BIEWIGUU AGOIEE. A transducer records the electric fields generated by the ocular muscles of the two globes (true electromyograms). The XANMOO knows the orientation of the pupil axis at any given moment. On the other hand, the excitable prisms that make up the panel (the latter being of microscopic dimensions) are located on the surface of a layer of viscous emulsion that allows them to rotate freely. These prisms are mechanically controlled by a double magnetic field, so that half of them obey a horizontal component and the other half obey a transverse component. In this way, both groups orient their faces independently, just as the Venetian blinds used by landlubbers orient their slats independently when the strings that regulate the angle of light entry are pulled (in this case, the "strings" will be the two magnetic fields, and the driving factor will be the response of the XANMOO to the eyeball's muscular micro-movements). Binocular perception offers images in normal relief, so that the subject believes that he is experiencing a real world away from the environment and the gelatinous mass that surrounds him. He can try to take the objects he "sees near him" and as the freedom of movement is wide despite the resistance of the viscous medium, it is advisable to "try" to avoid muscle inactivity.

The EEWEANIXOO is what you would call a "SCAPHANDER" or CLOTHING. In reality, this protection is gradually being replaced by others with different characteristics for certain flight conditions. The EEWEANIXOO OOE is precisely used during the phase in which the AYIYAA OAYU (IMAGE 1 12) or TOROIDAL CABIN is filled with a GEL that we call DAXEE. This gelatinous mass, apart from other functions, acts as a shock absorber during the acceleration or deceleration procedures of the UEWA.

The travelling OEMII is thus embedded within this viscous mass, directly isolated from its brothers and subjected to the dynamics of accelerations which sometimes exceeded 245 meters/s<sup>2</sup> (although these peaks of accelerations last few fractions of UIW). The description of these "CLOTHES" as well as of the BIEWIGUU AGOYEE system (PSYCHIC AND PHYSIOLOGIC-BIOLOGICAL CONTROL) would require as many pages as this document. To summarize, the EEWE (CLOTHING) is a complex membrane that peripherally surrounds the traveler's body without its surface making any contact with the epidermis of the OEMII (HUMAN BODY). The whole is located in the gelatinous mass in such a way that when an acceleration in a certain direction occurs, the gel substance liquefies in the environment, and the traveler's body adopts, with the help of the outside, a posture that makes the effects minimal. The space that separates the internal surface of the EEWEANIXOO OOE from the human skin, is rigorously controlled according to the degree of capillary vasodilatation of the epidermis and the transpiration of the same. In this way, the metabolic heat of the body adopts the normal values in the usual conditions of flight. Pressure,

carbon dioxide absorption, regulation of nitrogen, oxygen, water vapor and other components of the internal constituents, are self-regulated according to the information offered by the sensors that control at any moment the metabolic and physiological activities of the respiratory, circulatory and epidermal apparatus. The physiological control equipment has been equipped with non-invasive transducer probes that check almost all the organic functions, inside the organic tissues, without the introduction of such xxxxx (I am not sure if he said UAXUOETY or OAXUOETT. This note is typewritten) is necessary. From the muscular activity and the evaluation of the levels of glycogen and lactic acid, to the complex control of the neurocortical activity that provides precise data on the psychic state of the subject, the whole range of the biological dynamisms is recorded and provides this informative current through about 2.16.106 informative channels to a XANMOO that, after having compared them with standard models, "dictates" the effectual or motor responses to the organs of the BIEWIGUU AGOIEE. A transducer records the electric fields generated by the ocular muscles of the two globes (true electromyograms). The XANMOO knows the orientation of the pupil axis at any given moment. On the other hand, the excitable prisms that make up the panel (the latter being of microscopic dimensions) are located on the surface of a layer of viscous emulsion that allows them to rotate freely. These prisms are mechanically controlled by a double magnetic field, so that half of them obey a horizontal component and the other half obey a transverse component. In this way, both groups orient their faces independently, just as the Venetian blinds used by landlubbers orient their slats independently when the strings that regulate the angle of light entry are pulled (in this case, the "strings" will be the two magnetic fields, and the driving factor will be the response of the XANMOO to the eyeball's muscular micro-movements). Binocular perception offers images in normal relief, so that the subject believes that he is experiencing a real world away from the environment and the gelatinous mass that surrounds him. He can try to pick up the objects he "sees near him" and as the freedom of movement is wide despite the resistance of the viscous medium, it is advisable to "try" to avoid muscular inactivity. The acoustic stimuli are synchronized with the image. The traveler can see the faces of his brothers, talk with them or immerse himself in the frozen landscape of ANAUGAA (tree species) of our distant UMMO forests. Two YOYGOAAXOO lodged in the nasal fossae provide in sequences, less rich than in the natural environment but sufficiently fast, programs of IAIKEAI (OLFACTIVE STIMULI) also synchronized with the images. This is one of the aspects of the psycho-biological control to which the travelling brother is subjected. We can visualize the UEWA control equipment at will or read a study text. One of the most interesting means is BOOGOO. Thanks to this system the muscular movements imitating the grip of a stylus (you would call it a pencil or a paintbrush) are injected into the XANMOO after they have been recorded. It orders the hand's responses as if it had actually made a drawing, a graphic or a text. The artificial image of this fictitious composition appears on the binocular panel as if we had actually drawn such graphic characters on a surface. A device integrated in the rectum collects the traveler's defecation. This one is first dehydrated, the residues are then, by a rigorous chemical analysis, dissociated and transmuted into oxygen or another gaseous chemical element. Something similar is done with the urine so that the chemically pure water of both excretions added to the remaining water in the EEWE's gas chamber (whose humidity level is a continuously regulated function) is returned to the central tanks as steam. But when the displacement of the UEWA (NEF) takes place far from the intense Gravitational Fields or within another three-dimensional frame or simply in a space zone free of dangerous physical agents, at a quasi constant speed in PHASE "AGIOOA", the cabin (IMAGE 3) fits into the ENNOI AGIOOA 22 (Can be translated by ASSEMBLING COUPOLE). Then the TAXED (GELATINEOUS) Mass passes to the "hydrosol" state (very fluid and of low viscosity), and it is

expelled out of the AYYAAA (TOROID CABIN) increasing the pressure of the gaseous mixture of the YAAXAIUU 13 cavity and allowing the astronauts to move more freely inside it. Then the strong vibratory magnetic field necessary to maintain in suspension this last structure is also cancelled.

#### SYSTEMS AND EQUIPMENT

All the auxiliary equipments of the UEWA are regulated within an AYUU (NETWORKS) and under the control of a XAANMOO (Equipment which carries out the functions similar to those of an electronic computer TERRESTRIAL, except that its technology is not based on the properties of vacuum tubes or printed circuits like yours SEE NOTE 1 IN APPENDIX) whose programming and decisions can be modified in extreme cases by the crew members.

#### NOTE N°1

There are great differences between the control systems used in the technology of OYAAGAA (PLANET EARTH) and ours, apart from their greater complexity and precision. The XANMOO (you would call them calculators, computers) are not composed by electronic circuits like the terrestrial ones, that is to say, vacuum tubes, solid state components like transistors or solid diodes, conductors and semi conductors, inductors, capacitors, among others, but by organs topographically integrated in stable crystals, that we call ODU GOOA (nucleic amplifiers). Their main characteristic is that it is not the voltages or electrical intensities that are amplified as on your terrestrial amplifiers, but the power. An input energy function injected into the ODU GOOA is translated at the output by another identical analytical function, but with higher energy values each time. The controlled release of energy takes place at the expense of the mass integrated in the amplifier and the phenomenon is realized dimensionally on a molecular scale. In the process intervene the number of atoms sufficient for the function to be considered macrophysically as continuous.

#### NOTE N°2

The storage of digital data is not carried out in the same way as for the peripheral memory units of the terrestrial digital computers: that is to say, by means of two states of magnetization of toroidal ferrite cores or in strips and disks covered with ferromagnetic or electrostatic emulsions, etc., but by the alteration, rigorously controlled, of the states of electron excitation in a technically balanced pure crystal of titanium. The coding is done by means of three orthogonal high frequency beams. The enormous storage capacity per unit volume in these XANMOO organs allows the accumulation of information without any restrictive criteria, ranging from images with a higher definition than that obtained by the physiological eye of the OEMII (HUMAN) to a huge range of numbers representative of a statistical matrix. The major problem is the distributive programming of this information according to its nature, so that the access criteria allow a flow of information of high speed and intensity.

Coordination between the systems of :

- IDUUWIIO (PROPULSION)
- OAWOOLEIBOZOO (INVERSION IN ANOTHER THREE-DIMENSIONAL SYSTEM)
- KEOYEEOO XAIUU (MAGNETIC COMPENSATION)
- TAXEE XUANOO (GELATINOUS SUBSTANCE TRANSFER)
- UAXOOAXOO (DETECTION AND EMISSION EQUIPMENT)

- OOXENNUU (EXTENSION OF THE FEET OF SUSTENTATION)
- BIEWIGUU AGOIEE (CONTROL OF THE PSYCHO-BIOLOGICAL ENVIRONMENT)
- YUXIIO (CONTROL OF THE EXTERNAL VISCOUS FLUID, GAS OR LIQUID)

is such, that any parameter related to the behavior of one of these systems in a given moment, is calculated by anticipation, to regulate the response times of the rest of the equipment involved.

The technique is similar, in its operational phase, to the system called by you under the name of "CONTROL BY REACTION WITH THE HELP OF A COMPUTER". The difference lies in the fact that our "computers" (XAANMOO) operate in a first phase through an analysis of continuous (analog) functions and then through an automatic process of statistical sampling and selection of the basic parameters (data sequence), performing the calculations digitally and thus offering a definitive quantified response. The reliability of the response is practically equal to unity (expressed in your own mathematical language). In PICTURE 5 , I offer you a summarized and abbreviated diagram of the AYUU (NETWORK) that coordinates all the dynamics of the UEWA. The connected equipment cannot be controlled directly by the crew members, although they have the choice to let the XAANMOO make decisions as would a SENSOR-BODIES or to modify their logical responses, provided that the decisions of our brothers are not challenged by the XAANMOO because of risks not foreseen by the OEMII (MAN) brain.

IDUWII AYII

(propulsion)

Regarding the technique we use for the inversion of all the atomic subparticles included in the geometric enclosure of the UEWA, we take the liberty of omitting any information that could be immediately applied by your physicists and terrestrial engineers. I must also censor the transmission of documents (although merely indicative) concerning the scientific bases of their application to the propulsion system of our ships.

In this case, therefore, I can only offer you a purely topographical description of the location of the corresponding equipment.

The IDUWII AYII equipment (propulsion) is distributed inside a toroid of revolution assembled (stamped) inside the DUII (fin or crown: Image 1- 6) which surrounds the vessel on its central plane. The energy source of this one is located in the ENNOI (turret or dome). This energy generator also has a toroidal morphology. Its most characteristic element is constituted by a lattice of strongly ionized gas whose circulation is controlled by a complex magnetic field of very high frequency (I use in this case the word "lattice" as a synonym of Network or Space Grid). The temperature of the ionized gas when it is in resonance with the frequency of the magnetic environment reaches the 0,7.106 Kelvin grades (I use naturally the terrestrial physical units).

The control of the propulsion is very complex: the direction, the cruising speed and the automatic control of the accelerations at each given moment, depend on the XAANMOO AYUUU (central network of computers). The kinematic function is very complicated, a function whose multiple corrective parameters depend for example on :

1. what we call USAGIISOO (the "isodynamic" state of cosmic space),
2. the presence of intense gravitational fields,
3. the threat of "COSMOLITOS" (excuse us for using our neologism which we consider more appropriate than the term "meteorite" or "aerolith"),

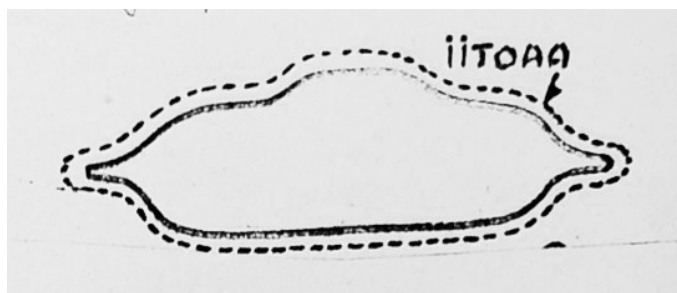


FIGURE 56: ideal outer layer (IITOOA) of the spaceship

4. possible attacks of foreign vessels,
5. space zones of ionic, electromagnetic, gravitational radiations, dangerous or disturbing for our on-board systems, etc...

This equipment is present in all the solid mass of the structure, although the control center is fixed in all our models of ships in the ENNOI, a kind of cylindroid turret which crowns our ships (Image 1 - 1 ). It is perhaps, if we except the IDUWII AYII equipment, the vital factor of our OAWOOLEA UEWA OEMM (whose phonetic roots: OAWOO = dimension; OOLEEA = to penetrate, to pierce; UEWAA = vehicle, vessel; OEMM = between the stars; sidereal; of spherical mass).

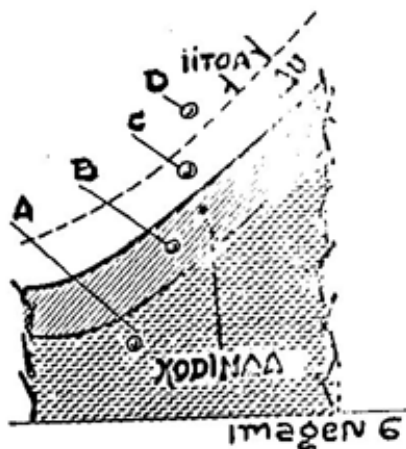
[Note: The phoneme OOLEA has a different meaning depending on the verbal context in which it is integrated. The most correct meaning when applied to the technical field is the following: to change, to pass from one physical medium to another. In scientific language it means: to increase or decrease the value of an angle in another infinitesimal angle. This would be, in the case we are studying, the most faithful version of the phonetic root].

The whole superstructure of the ship, as we will explain later, is protected by a finely perforated ceramic substance, which covers the external armor.

A safety space layer is delimited, whose thickness reaches a value of  $\Delta U = 0.0176$  ENMOO (1 ENMOO is equivalent to some 1.873 meters) and which surrounds the whole UEWA. We call IITOOA the ideal outer layer whose morphology is similar to that of the ship (FIGURE 56) and which separates the enclosure from the rest of Space.

Any subatomic particle or energetic "quantum" (IBOZOO UU) located inside this enclosure can be inverted into another three-dimensional system. For example (FIGURE 56): a neutron "A" corresponding to any mass of the interior of the vessel, as well as the masses of the crew members, the gases, the ionic radiations, etc. Thus, for example, another proton "B" belonging to the envelope or shielding, as well as all the atomic and energetic sub-particles "C" of any gas molecule or cosmic dust particle contained in the thin cortical environment of thickness  $\Delta U$  delimited by the IITOA, would seem to "disappear" at the sight of an imaginary observer provided with an exceptional observation equipment, situated outside the enclosure delimited by the IITOA.

This instantaneous transformation that we call OAWOOLEAIDAA is caused by the same IBOZOO AIDAA equipment that simultaneously reverses the oriented "axes" of all the IBOZOO UU including those of its own structure.



(D69-6)

(IITOA, XODINAA)

FIGURE 56A: IITOA XODINAA (MEMBRANE + OUTER LAYER OF PROTECTION)

I cannot even suggest to you what is the technical basis of this system, whose only allusion must represent today for your terrestrial engineers a fantasy surrounded by science fiction.

But on the other hand, I can offer you some additional facts: the energy input necessary for this physical transformation is very large, and is represented for our UEWA by the graphic representation of the function  $P=\phi(t)$ .

The necessary energy involved up to time  $t_0$  OAWOOLEAIDAA (time when all the subparticles undergo their inversion) is fully restored without loss, in such a way that  $\Delta W_1 = \Delta W_2$ , both represented by the purple hatched surfaces of the graph, and are transformed in the new three-dimensional framework in the form of MASS ( $\Delta W_2$  represents the energy equivalent of the generated Mass). You will better understand its physical meaning if I tell you that immediately after  $t_0$ , in the new three-dimensional frame, the UEWA moves at a higher speed without the sudden change in speed (infinite acceleration at time  $t_0$ ) being accused by the ship and its crew.

$P_0$  represents the Power threshold necessary to transform the entire mass  $m_0$  of the UEWA ( $m_0$  represents not the mass at absolute rest but the real mass with respect to a referential system at the instant  $t_0$ ). The limiting power  $P_0 = \phi(m_0)$  does not only include the mass of the UEWA but also that of the particles contained in the enclosure of the ITOOA (FIGURE 56) (see also note 10).

As we told you, the crew of one of our ships is not in the ENNAOEI itself (image 1-2). On the contrary, this cavity-shaped structure has inside a second "floating" annular and hollow structure that we name AYIYAA OYUU; inside which not only the travelers are located, but also the whole

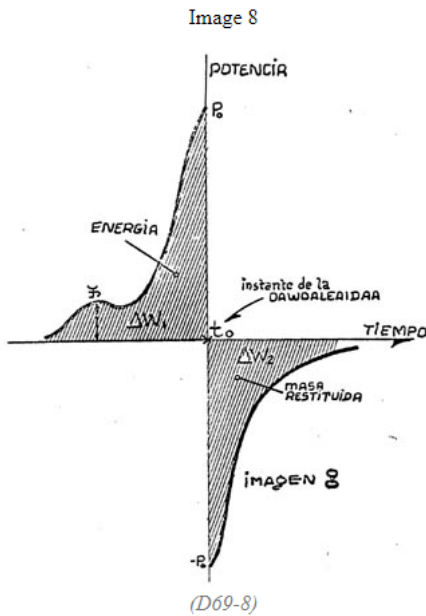


FIGURE 57: Graphical representation of the function  $P=\phi(t)$ / POWER function (function of Time) which gives the restitution of the inverted mass over time

range of auxiliary equipment transported and a series of control and direct detection devices (image 9). The situation of this FLOATING CABIN provided with exits or hatches which we call IMMAA (image 1-15) inside the cavity YAAXAIUU can present two Phases. (See OEE Phase and AGIOA Phase).

OEE phase

Assume a first phase of "flight" or movement of the UEWA, in which it does not move at a moderately constant cruising speed or with bearable bursts of acceleration. That is to say, an interval during which the Ship to reach high levels of speed, is obliged to undergo large "slopes" of the speed function "t".

The inside of the AYIYAA UU is previously filled with a viscous mass in the "GEL" state, as the Earth's chemical physicists call it. This is a low-level "hydrosol" suspended gelification compound originally contained in the YAAXAIUU (image 1 -13). Its coagulation in some cases and its subsequent regression to the colloid solution state is carried out thanks to the characteristics of the solvent used, because at a temperature threshold of 24.611°C, it is converted into a high conductivity electrolyte. Its thixotropic properties are null, so that no dynamic effect in its breast (agitation) causes its transformation into "SOL".

Our brother travelers have also previously donned the EEWEANIXOO (hermetic protective garment - note 6, previously seen ) so that the OEMII remain in suspension within the high viscosity index jelly (TAXEE) which, among other functions, acts as a protector or shock absorber against the acceleration points of the structure on specific occasions.

Simultaneously the AYIYAA OYUU "floats" inside the UEWA superstructure, within a very energetic magnetic field generated in the membrane of the AAXOO XAIUU AYII (located in



another toroid immersed in the DUII (image 1-14 ). This medium frequency field generates, in the membrane of AYIYAA OAYUU (a membrane with a very low electrical resistivity coefficient when maintained at temperatures in the range of  $0.000825^\circ$  Kelvin), circular electric currents with an axial magnetic field opposing the inductor, maintains the toroidal cabin in which the crew members protected by the gelatinous mass are travelling. This magnetic suspension was not specially provoked to compensate for gravitational actions which are naturally almost non-existent in intra-galactic spaces, but by maintaining strict control over all points of the cavity, As for the intensity of the field, frequency and gradient, this YAAXAIUU behaves like a "perfectly elastic mattress" that cushions the sudden dynamic effects experienced by the vessel.

In this way, we enjoy during the journey the double protection of the TAXEE (frozen) on the one hand and the magnetically controlled elastic medium on the other. It is clear that such protection would not suffice for certain acceleration rates, but these are never exceeded even if certain effects seem to show the contrary, as I will explain at the end of this document.

AGIOA phase

Image 3

During the long trajectory of our journey, and once we reach a stable kinematic regime, all the security measures described above are useless. The stabilization process is as follows: by a rigorous control of the magnetic field, the cabin AYIYAA OAYUU is located exactly in the axis of the UEWA, by descending its center of gravity from that of the vessel until it is assembled or nested in a protuberance located at the base, called ENNOII AGIOAA (image 10-22).

This connection or assembly does not imply a mechanical contact between the surfaces, on the contrary, there remains a separation of some 0.6 twelfths of ENMOO (image 10 - 58) which is filled, as we will see later, with a colloid suspension which acts as a lubricant.

A second process started simultaneously inside the cabin. The gelled mass is brought by a double effect (thermal change and controlled ionization) to the state of hydrosol, as the name your scientific brothers (in other words the protective jelly again adopts the initial liquid structure of colloid suspension). This liquid mass is pumped outside, that is to say into the YAAXAIUI (magnetic cavity filled with ARGON-OXYGENE ). This liquefied mass can be divided in the absence of gravitational field into a multitude of spheroidal corpuscles that float within the cavity.

We, the crew, can then move freely within the long annular corridor, after getting rid of part of our EEWEANIXOO. This phase is called AGHIOA (Image 10/ FIGURE 58).

In image 1-9, you can see that we depicted travelers walking while keeping their bodies parallel to the equatorial plane of the toroid AYIYAA. This is due to the fact that in the AGHIOA phase and in the OOE phase, the annular cabin maintains a constant rate of angular velocity in order to cause artificial gravity (centrifugal force). The side effects caused on the vestibular system of internal hearing and other small psychophysiological disorders, have been solved.

In certain cases, the relative speed of the two structures (ENNAEOI and AYIYAA OAYUU) must be zero. That is, the inner ring cabin forms a single body with the outer enclosure. This is necessary when you need access to the different areas of the superstructure (remember that it contains many vital equipment and also reserves of necessary products for the long journey) and on other occasions to go outside thanks to the IMMAA (airtight hatches).

In this case, the vessel rotates around its central axis to adapt its angular moment with that of the cabin so that centrifugal acceleration (artificial gravity) continues to be constant.

But in any case, the automatic control of the system is self-compassion. The central XAANMOO

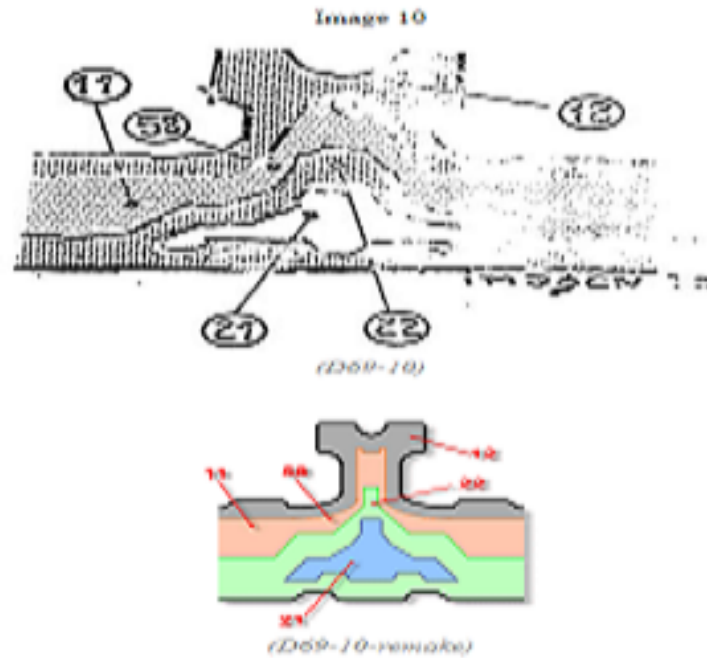


FIGURE 58: ENNOII AGIOAA

(computer) is not only informed at every moment of the variations of the UEWA Centre of Gravity and Centre of Inertia, but also has a permanent record of all deformations and micro-deformations of the structural mass; for example, if any element of the vessel starts a rotation, challenging, by the known principle of "Conservation of the amount of motion", an opposite rotation in UEWA, XAANMOO controls the dynamics of other components by stimulating them to compensate for this effect.

The Ummite information on their ship is very consistent, and the small size of the ship is explained on the one hand by the miniaturization of the central computers which pilot the ship in an automatic way, and on the other hand by the energy necessary to carry out the mass inversion and thus change the dimensional framework.

What you would call "covering the structure" is qualified by us under the name or untranslatable phoneme of XOODI NAA. Undoubtedly the closest Spanish term to designate it would be "membrane", but this term can suggest purely static properties of protection, of barrier, whereas in reality, as you can see, it has very complex dynamic functional characteristics.

This "MEMBRANE" has very characteristic structural resistance properties because, thanks to UYOOALADAA, it can modify its coefficients of elasticity and mechanical rigidity within a wide range of values (vascular network with ducts at inside which flows a liquefiable alloy). (See image 11-58. See also note 15). These coefficients of elasticity can be modified at any time as a function of multiple parameters depending on the environment and the course of the flight. The XOODI NAA must also withstand high temperatures due to the significant friction to which it may be subjected when passing through atmospheres of particular chemical compositions and varied thermal

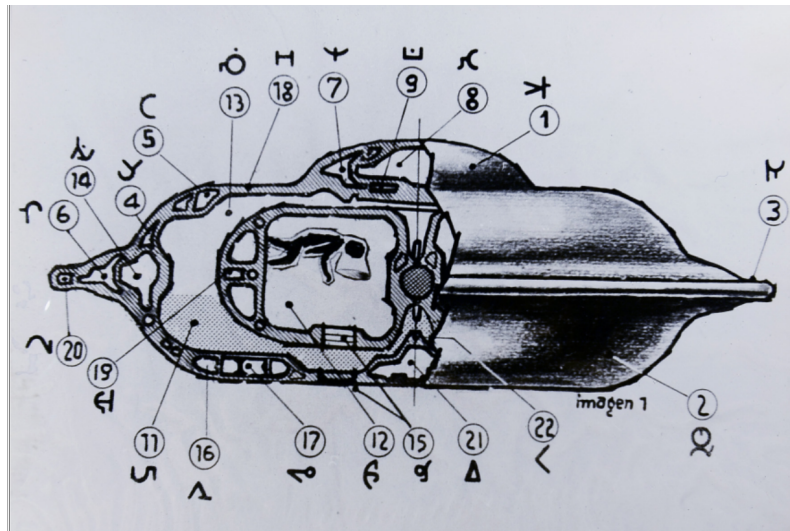


FIGURE 59: Cross section of the Ummite nave UEWA (CLOSE UP)

conditions.

It can also withstand the continuous abrasion of cosmic dust and the sporadic impacts of a wide gravimetric spectrum of "micro-cosmolites" (meteorites). It also contains within it, as I will explain to you, a rich multiplicity of sensitive organs (transducers as your engineer brothers would call them), connected with the central XAANMOO AYUBAA.

But above all, it was designed to withstand the high dynamic stresses it experiences during flight. It should not be forgotten that throughout its course, the effects of dynamic resonance for determined frequencies can cause serious disorders in the complex organs integrated in the XOODI NAA (membrane) to such an extent that it is necessary on certain occasions to generate oscillations out of phase with the disturbing ones, to compensate for them.

I am going to briefly describe to you, at a level of superficial technical disclosure, a section of the XOODI NAA, with the usual reservations and warning you that I deliberately omit the allusion and the drawing of certain devices or systems and even of one of the fundamental components of the XOODI NAA. In image 11, drawn with colored pencils, I represent an enlargement of the membrane. For didactic reasons, I did not absolutely respect the real proportions of the devices included in it, which means that some components have been drawn on a larger scale, without respecting the true dimensional relationships. In a nutshell, the scheme is more true from a topological point of view, than from a dimensional one. I also warn you that the sample represented corresponds to the DUII (crown, image 1 - 3). Other areas of the ship's coverage are different, both in surface density, component distribution, and function.

The configuration of this XOODINAA has characteristics that you could call "modular". The different organs or detector devices exposed to a defined spatial environment, are repeated in adjacent zones of equal size, and undergo, as I told you above, gradual modifications each time more accentuated in the different zones of the UEWA.

The topographical problems that arise when planning the distribution and adaptation of this wide range of elements, some of which do not occupy volumes greater than  $0.07 \text{ mm}^3$  (composed in turn of microdevices manufactured at a scale that we could call cellular) will seem unimaginable

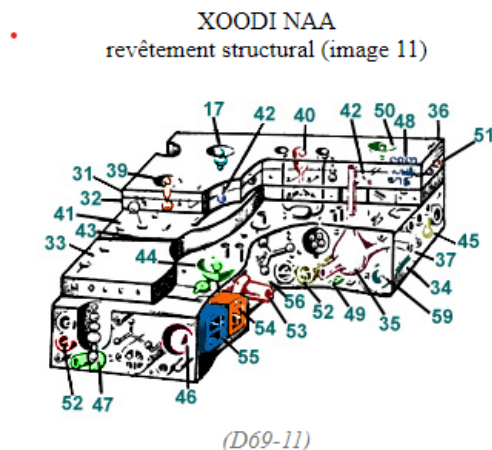


Image 11 [NdT: (lire: 57 au lieu de 17, 58 au lieu de 52, 38 au lieu de 48)]

FIGURE 60: structural coating

to you because it was necessary to harmonize the functionality of these components and their possibility of recovery in the event of deterioration by the disturbing and destructive action of the physicochemical agents of the environment. (I invite Earth mathematicians to specialize in two branches of this science which will be of vital importance to you in the future: TOPOLOGY and what you call operational research including GRAPH THEORY.

Finally I point out to you that in the graphic (image 11) of the membrane of the vessel, the organs have been represented as if in the whole section there was only one unit. In reality the density of distribution is different in each case for a unit of determined volume.

Note 15

The coefficients of elasticity of the various structural zones of the UEWA can be modified at any time thanks to the AYUBAA UYOALAADAA. The channels of this vascular network, reticular, contain a fluid alloy which can be easily melted thanks to a chain of XAANIBOOA nuclei (image 11-58) which is distributed axially in the focal axes. These thermal radiators liquefy the mass of AALAADAA (crystallized mixture of metals) located inside. The alloy is intended to have a high coefficient of elasticity, a low level of melting and a high thermal conductivity. The NETWORK ducts are circular and elliptical in section depending on the areas of the XOODINAA where they are integrated.

31: UOXOODINAA. It is a porous coating of ceramic composition with a high melting point (7260,64° C. Terrestrial); its external emissivity is also high and its thermal conductivity very low (2,07113.10 -6 cal/(cm) (s) (°C). It is very important for the XOODINAA that the ablation is maintained within a very large tolerance range. For this purpose a transpiration cooling system based on liquefied lithium is used (see 35). Despite the fact that the internal mechanical stresses to which the MEMBRANE is subjected are high, it does not deteriorate easily. However, sporadic fractures and cracks can be self-repaired (see Note 7). (UOXOODINAA has a thin intermediate layer of platinum colloidal located at 0.006 ENMOO from the outer surface. The function of this

metallic film is related to a protection system against abrasion due to cosmic dust (see note 19 opposite).

32: IASXOODINAA. formed by a very elastic material of very low thermal and electrical conductivity. Inside are capsules [50] (YAAEDINNOO) containing a dose of the same material called UYOOXIGEE (ceramic product) which forms the external layer already mentioned [UOXOODINAA - 31]. From each of these capsules starts a network of quasi-capillary tubes and a series of information channels ULNII (see note 3 opposite) connected with the YAEDINNOO to a series of UAXOO (detectors) located in the mass of the first layer [31]. When this layer cracks or when micro-cracks appear or when it is perforated by the impact of small meteorites, these detectors are excited and activate the YAEDINNOO. The ceramic product is melted up to a temperature of 7655.8° C and it is led, flowing through the vascular network, to the corresponding crevice, to weld or to fill the cavity of the perforation. Each capsule of the system protects a small area above the ceramic layer, and the vascular connections compensate for the loss of product that may have been used after an emergency.

33: IENXOODINAA. This is a crystallized layer or sub-membrane of silicon dioxide and modulated in a hexagonal mosaic shape.

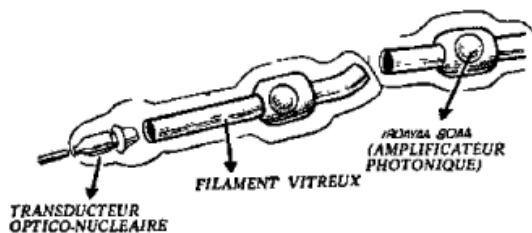
34: IEVOOXOODINAA. It constitutes the most internal layer or bark of the XOODINAA. It is also the thickest. Its constitution is complex, but its main component is an alloy whose basic elements are those you call Coulombium (Niobium) and Tungsten (Wolfram)

35: They are refrigerated sensors integrated in the IEVOXOODINAA. A duct emerges from the UOXOODINAA. On the image we can distinguish a floating crown in the ceramic mass of this layer which detects the thermal gradients, activating the emission of a lithium isotope when the temperature reaches a certain level. Then, this fluid flows out, vaporizing while absorbing heat. In some areas of the UEWA, lithium is replaced by cesium. These elements are later put in reserve in a vascular network, the lithium flowing at a temperature of 318,622°C.

36 to 49: UAXOO (detectors or receptors). On all the surface of XOODINAA are a series of UAXOO. These are sensory organs activated by various stimuli of a physical, chemical or biological nature (for example: electromagnetic frequencies, elastic tensions, magnetic and gravitational fields, electrostatic gradients, static and dynamic pressures, molecular presence of gases, existence of moulds and viruses, etc.). Electronic technicians and earth systems engineers would say that these are transducers that can transform the exciting energy function into an equivalent function of nature: "Optical, gravitational or nuclear resonance" see NOTE 3. You also use transducers whose common characteristic is the transformation of stimuli into a function of an electrical nature, but as far as we are concerned, the specialists had to face simultaneously five types of problems that are compatible as far as the solutions are concerned:

- Reliability of the response, so that the output function is a faithful image of the input function;
- Thermal ranges: the temperatures of what you call the boundary layer can reach high peaks during high velocities in a gaseous fluid corresponding to some atmospheres of different OYAA (planets). Although the Vessel has systems capable of controlling the gaseous environment (as we will explain to you) and on the other hand the transpiration cooling of the Caesium (ablation) limits the value of the temperature on the external ceramic layer, the unavoidable thermal gradients alter the fidelity of transduction because the "signal/noise" relation increases significantly. Apparently, we cannot fight against this fatal obstacle, no matter how advanced the envisaged techniques are. It is precisely for this reason that the UAXOO are distributed in a very dense way all around the UEWA, i.e. in zones affected in various ways by these gradients.

Note 3: The information transmission channels within our equipment are of two types: NIIUAXOO



(D69-note3-A)

FIGURE 61: (Glassy filament (NII), IBOAYAA OOOA (photonic amplifier))

(receiver channel or data transmitter) and NIIAXOO (effector channel, transmitter of orders or series of impulses) for the activation of the different executive organs of the AYUU (Network). Terrestrial systems use almost exclusively conductors and semiconductors to connect the different elements of a network. These circuits, which have at the same time characteristics of resistivity, capacity and inductance and which are also able to carry coded messages by means of a flow of electrons, have the disadvantage of distorting the information according to their length. For these reasons, we rarely use this type of electrical transmission except in cases where the response does not require a high degree of integrity and fidelity. Our systems are programmed in such a way that each coded message is transmitted simultaneously by three channels or physical systems of information transmission, radically different at the base so that the reliability of the answer is practically unity, and that the probability for the three systems to fail at the same time is very reduced except in the case of mechanical destruction of the transceiver organs of the AYUBAA (Network) On the other hand, even supposing that external physical factors disturb the content of the information in one of the channels, the undisturbed response or the one disturbed differently from the others, allows to reconstitute the original signal in all its purity. The first UULNII system (optical information transmission) uses a glass fiber (FIGURE 61) through which can be transmitted simultaneously from 10.3 to 8.10.6 simultaneous channels or distinct flows of information in an electromagnetic spectrum that extends from 6.72.10.14 to 8.96.10.14 cycles/seconds.

The light undergoes different reflections on the cylindrical corrugated surface of the fiber (whose refractive index varies from the center to the periphery) hence the attenuation for long connection lengths that may require the interconnection, at intervals, of photonic autonomous amplifiers (IBOAYAA GOOA). The ULNII technique is still in use on our UMMO although it was developed a long time ago. The second system does not use any physical means of interconnection. It is based on the emission of gravitational waves in a wide spectrum of very high frequencies. The use of immense energies is necessary for this type of transmitters, this is their main disadvantage. In exchange they are not disturbed by fields foreign to the AYUU (Network). This technique is less ancient than the previous one. The third system uses a resonance effect totally unknown to your physicist brothers on Earth (see Note 4 below).

Note 4 To understand the OAWOENNIUU effect (nuclear resonance) it would be necessary to explain our theory of the constitution of Space and Matter. I will try to give you a summary using concepts that are familiar to you. Suppose for example a numerically reduced set of molybdenum

atoms: for example Mo1, Mo2, Mo3...My whose nuclei have the particularity, at a given moment, to have an identical configuration of their energy levels referring to the distribution of their nucleons. It does not matter that the quantum levels of their electron shells are different or that their orbits are shared in any chemical sequence. We then say that these atoms are OAWOOENII (in resonance). We also know that any atomic corpuscle (neutron, proton, K-meson, etc.) is in reality a different projection in a three-dimensional frame, of the same mathematical-true entity that we call IBOZOO UU [to the extent that we grant in the WAAM (universe) the attribute of true or existent to the IBOZOO UU alone]. You can imagine the IBOZOO UU by a didactic image, as a "bundle" or "bundle" of "ideal axes" whose different poly-directive orientations would give place to what a physicist interprets this "bundle" or "bundle" (or "hedgehog") to the multiple oriented points, some times as a quantum, and other times as a mass, a lepton or an electron. The latter as mass, electric charge, orbital moment, etc., actually represent the different axial orientations of the IBOZOO UU in the same way that the different chromatic tones have as their basis a different frequency in the electromagnetic spectrum. Imagine that we try to disorient, within the Mo1 atom, a single nucleon (a proton for example); it may happen that the inversion is not absolute, in which case the effect observable to you would be the conversion of the mass of the proton into energy.  $\Delta E = m C^2 + K$  where m being the mass of the proton and K a constant.

We thus obtain the isotope of Niobium (as you call this fundamental chemical element). But we can force the disorientation of the "axes" of the IBOZOO UU (absolute inversion) in such a way that an observant physicist would see, surprised, that the proton seems to have ANNIHILATED without release of ENERGY. This phenomenon would seem to you to contradict the universal principle of conservation of mass and energy (conservation rightly questioned by other Earth physicists); indeed the Hypotheses formulated by some EARTHERS on the present CREATION OF MATTER IN THE UNIVERSE are in reality based on the fact that indeed sets of IBOZOO UU totally invert in our three-dimensional framework, becoming observable by those who live there. Let us now observe a negatively ionized Niobium atom. Without doubt, the rest of the n-1 Molybdenum atoms have undergone an alteration in their nuclear energy levels, so that the nucleic energy of each of these atoms increments in  $\frac{\omega}{R_1^3}$  verifying that:  $\zeta(\Delta E - K) = \sum_{i=1}^{n-1} \frac{\omega}{R_i^3}$ .

$R_1$  = Radial distances to the Niobium atom of each of the remaining ones.

$\omega$  and  $\zeta$ : "constants" of the system, whose values depend not only on n, but also on the nuclear structures and  $R_1$ . The energy transferred to the nuclei of the remaining Mo atoms, by this resonance effect, is quantified in such a way that it can reach zero for an atom of the set located at a distance R greater than a defined threshold. Thus, if we manage to excite a Molybdenum atom (Mo1) located in a transmitting organ by interchanging one of its nucleons, we will notice in a receiving organ (Note 4) containing another Mo2 atom, a quantum alteration in the latter, all the more elevated as there will be fewer parasitic atoms in resonance nearby.

It is necessary to specify that the transfer of energy is not made thanks to an exciter field so that the time of transmission is null (we speak then about speed of transfer or INFINI informative flow). This physical principle would apparently facilitate the development of "instantaneous" communication systems at enormous interplanetary distances, so that a message does not take several light years to reach its destination. Unfortunately, this is not feasible in practice, because the existence of disturbing or parasitic atoms in freedom, in resonance with the transmitter, would absorb all the energy of the system. A quantified part of this energy would never be transferred by resonance to an atom so far away. The efficiency of the transmission system depends on the fact that there are no masses of a similar chemical element in the vicinity of the network, which would

attenuate the transmitted signals.

Note 7: It is difficult to translate correctly the word XOOGU AYUBAA (AYUBAA is a term equivalent to "Network" or "structure" in dynamic link). The phoneme XOOGU (the G is pronounced like an aspirated H) applies to a whole technical system that the earthly engineers, your brothers, do not know yet but that they will inevitably develop and perfect in a more or less near future.

As I have already explained to you in the summary I gave you eighteen days ago about the XOOIMAA UGII, the complexity of the structural modules has reached such a high level that direct access to these vital organs is becoming almost impossible with the means you earthlings have. In a cubic decimeter, for example, there can be between 400 and 23000 organs or autonomous devices, each of them provided with hundreds or at least tens (for the less complex ones) of functional micro-elements, components whose volume, in some cases, does not exceed 0.0006 cubic millimeters, and even some elements can be reduced to a few molecules, to say nothing of some equipments of which a single atom or an isolated atomic corpuscle exerts an essential function. Under these conditions, as an engineer, you can imagine the level of the orders of problems that arise in these systems.

First of all the reliability of the AYUU (Network), because although many components work in parallel so that the failure of one is compensated by the others, we must not forget that the deterioration of any micro-element can paralyze a whole system that is several million times larger in volume. The degree of statistical reliability expressed in earth language, is an inverse function (as you know) of the number of components, and although naturally the systems are simplified to the maximum allowed by our current technological level, the functional limitations are obvious.

The second dramatic problem is what you call system maintenance. Uniform reliability (100%) is never achieved. Thus, three new problems arise: - Identification of the failed component. - You can imagine, in the case of our XOODINAA or Vessel membrane where millions of components accumulate, that a human operator, even with high precision and finesse instruments, could never access it to find the micro-component in failure, without destroying, or at least disassembling vital parts surrounding and masking the "sick" organ. You can even imagine the big difference with the damage of a terrestrial milli-ammeter whose frame has burned, in which case the repairer could dismantle it on his work table, unscrewing some small bolts and re-soldering some connections. Identifying the damage in our systems is easy for the XANMOO AYUBAA. When the response of these devices is discordant, and the XANMOO becomes "aware" of this because it compares it with other responses of parallel organs or with memorized MODEL responses, then it calculates with different probabilistic values the components that may have caused the abnormal "behavior" of the organ in question. -

- Speed of substitution. - The abnormal component must be replaced and sometimes even repaired very quickly "in situ", as you would say. This would be impossible considering the difficulties of its inaccessibility if there was not our XOOGU AYUBAA system. If one of the UEWA travelers were to repair these micromodular damages directly, several hundred UIWs could be spent and perhaps even would not be possible. The problem, and forgive me if I use an easy didactic comparison, would be the same or analogous to that which would be faced by an earthly neurosurgeon who wanted to perform, for example, a marrow or kidney tissue transplant on a soldier running on a battlefield.

IDENTIFICATION, ACCESS and SPEED in the repair of the component are the problems that, without a satisfactory solution, would disable or condemn without remission a technological progress that by assumption requires each time a greater functional complexity in an AYUBAA (under the denomination of AYUU, belong not only what you call graphs, but also a great part of the



structures that you integrate under the terrestrial denomination of engineering of the systems)

- XOOGU AYUGAA. - This system solves each of the supposedly typical problems of a system with complex links. It is a complicated vascular NETWORK immersed within some functional structure. Its similarity to the arterial and capillary blood NETWORK of some multi-cellular beings is obvious, although its functioning is different, as you will see. Billions of small channels connect all the organs with the AYUBAA. This network is reticular-radial.

You can think of it as a connected graph, some of its subgraphs are tree-like. On the other hand, its branches are oriented only in these and not in the circuits or meshes. A sending center encloses the new components, which must replace the failed ones, in a cylindroid gelatinous mass (NUUGII) the cylinder moves through the vascular conduit to a IBOO (point or node in the network). The NUGII is pushed by the pressure difference  $\Delta P = P1 - P2$  of the Helium gas contained in the conduit. The IBOOs (points or nodes) are true communication nerve centers that perform the following functions:

- It receives the micromodule wrapped in its viscous protective cylinder.
- If necessary, it modifies the caliber of the latter (NUUGII) by decreasing or increasing the jelly.
- It resends it at a different speed through one of the remaining branches or competing channels.

All IBOOs are controlled by a coordinating XANMOO center.

Finally the NUUGII arrives at its destination (the failed component). Beforehand, the failed component has been removed from its location and then shipped back to another NUUGII to be finally disposed of by fusion, decomposition and nuclear transmutation. The new micro-element is freed from its gelatinous envelope (by oxidation of the gel with liquid oxygen). It is then subjected to the action of a controlled gravitational field which orients it spatially. (This field is reduced to a small environment, it is not a uniform field: on the contrary, complex dynamic gradients in each point of the field allow the orientation of the part and cause rotations and linear displacements). In this way, the component is transported to its new location and nested with the others. The modification of the gravitational field is carried out thanks to the NUUGI IADUU, gelatinous cylinders that accompany the part immersed in the NUUGII. These return to the starting point, once their mission is accomplished.

Although the above description is very brief (you can imagine that an exhaustive study of the system would occupy thousands of pages of this format), it allows you to see how our systems are "self-repairing". All of this presents another set of problems of a topological nature, since the least reliable components must be positioned at the periphery so that they can be easily recovered.

The elements of the structure that can be damaged, melted or simply suffer abrasion or chemical corrosion and that, at the same time, because of their excessive volume, cannot be transported through the channels of the XOOGU are repaired in another way: By means of the NUUGII are transported the small, complex pulse-controlled tools (see note 3, top of page), which themselves perform the repair at the place where the damage occurred. The range of operations can be very complex and the repair equipment follows one another in sequence, with the XANMOO XOOGUU scheduling their functions. Let's see some of them:

- Transducer equipment that accesses the failed organ to perform an assessment and obtain images, etc.
- Impactors that subject the deteriorated element to instantaneous pressures in different points of it.
- Mobile devices that send a self-welding product of different nature depending on the component to be repaired.
- Equipment capable of creating high thermal gradients that can cause the fusion, in any area of

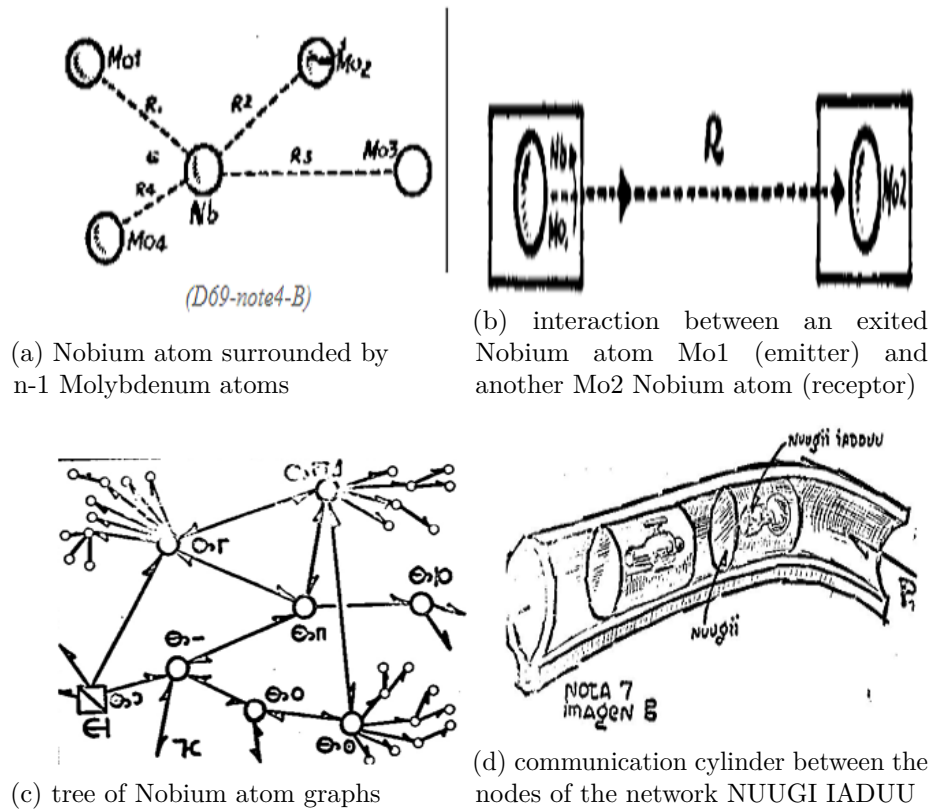


FIGURE 62: Quantum communication between atoms inside the membrane of the spatialship thanks to OAWOENNIUU (nuclear resonance)

the damaged element etc.

For this reason, many devices of all technical equipment on the UMMO planet have a cylindrical structure and their elements or components are located in the internal walls of the cylinder. Its shape allows the passage of the NUUGII which, in turn, has access to any of the components located in the inner periphery.

All these operations are regulated and planned by the corresponding XANMOO. The UEWA travelers do not have to worry about the multiple micro-damages that occur at each UIW in any point of the structure of the Vessel. In short, we know, suitably ordered, "a posteriori", the frequencies with which these damages occurred. If their statistical distribution is abnormal, this will be taken into account in the future for the new projects of structures and systems design.

Note 19: NIIO ADOGOOI system.

The mass of the UEWA OEMM creates a gravitational field which, without being excessively intense, accelerates in some intragalactic regions where it navigates and where the density of cosmic dust is appreciable, particles of different natures which will crash against the XOODINAA (coating) causing irreparable wear due to this continuous abrasion. Our NIIO ADOGOOI system avoids

this risk. The UOXOODINNAA (superficial layer of the membrane) has a very thin underlayer (XOODINAADOO). consisting of very fine colloidal particles of platinum in emulsion in a medium with a high dielectric coefficient.

Distributed on the periphery of the vessel, there are the NIIO ADOUAXOO (ionizing cells) which have a double function: first, they measure the electrostatic gradients in the environment close to UEWA. In case a large nebula of cosmic dust (solid particles of methane, for example, or nickel-iron or ammonia or silicon, etc.) surrounds the ship, it can happen that the particles are neutral (without electrical charge) or ionized (+ or -).

Assume the first case: that is, neutral. The particles will move towards the Vessel (spatialship) because the gravitational gradient is favorable to this flow.

The detection systems that we have described to you in this document have recorded in advance the spatial density of these particles, their gravimetric spectrum (i.e. the statistical distribution according to their masses and morphologies), their composition chemical and their average electrostatic charge (zero in the present case) as well as their kinematic function with respect to the reference emitting galactic centers (relative speed of movement and direction, expansion coefficient of the nebula, etc.).

All these data are analyzed in the central XANMOO causing the response of the NIIO ADOGOOI (anti-abrasion protection system). Ion-generating cells (NIIO ADOUAXOO) emit pulsed electrons with high energy which are projected in parabolic trajectories outwards.

At the same time, the colloidal platinum membrane (XOODINNADOO) is charged with an electrostatic potential that can reach values between 180,000 and 900,600 volts (negative potential). Each particle that moves towards the membrane (image B, see above) at a speed  $U$  picks up one or more electrons, coming from the flux emitted by the UEWA. The particle then becomes ionized. As the electric potential gradient is very high in the vicinity of the vessel, the electric repulsion compensates both the kinetic energy and the gravitational attraction force in such a way that the attacking particle is deviated in its trajectory and does not make contact with the surface of the UOXODINAA.

In the case where the cosmic dust is already ionized, the platinum submembrane electrifies with a charge identical to that of the attacking cloud. Observe that the XOODINAADOO is protected by another top layer of the same nature or ceramic material as the UOXOODINAA.

A secondary effect of charge transfer between the free surface of the membrane and the colloidal platinum underlayer, creates a photonic emission from the ceramic crust within the visible spectrum for our retinas in wavelengths in the vacuum of 596.9 millimicrons terrestrial and 602.34 or 612.68 millimicrons. This electroluminescence is not caused by the impact of electrons on the mass but by the electric field that they generate while passing in the translucent ceramic mass. An external observer notes an intense luminosity whose nuance depends on the emitted wavelength, oscillating from green-yellowish to carmine. These chromatic tones are not always the same because they obviously depend on the chemical composition of the ceramic covering.

The brightness of our OEMM UEWAs seen from a distance is not always due to this electroluminescence.

On some occasions the UOXOODINAA, in its peripheral layer, is thermally activated until it reaches a sufficiently high temperature to reach the radiant level that you call cherry red. This is done for two reasons: to burn the oxygen deposited in the pores and on the other hand to free its surface from micro-organisms and other organic remains before leaving the atmosphere for other destinations. This last means is part of the general asepsis program of the Vessel which precedes any interplanetary navigation (the process receives the name of AIAIEDUNNEII). In this way, we avoid disturbing the ecological environment of each OYAA by bringing in biological structures of foreign

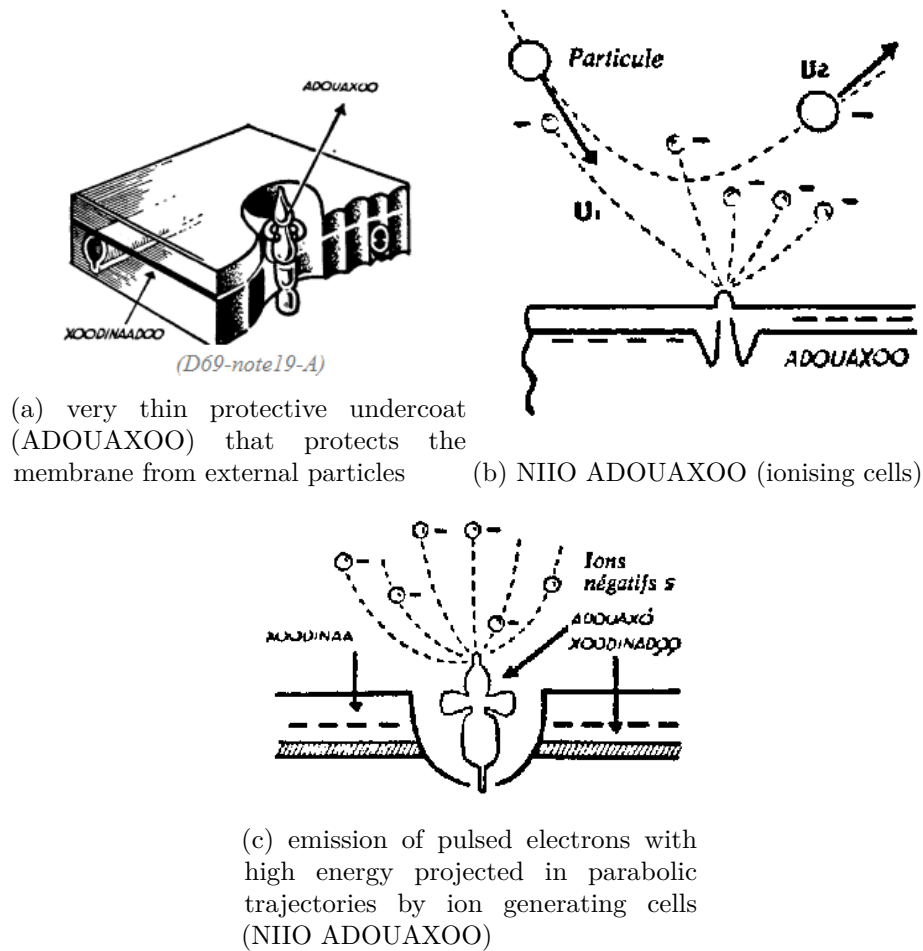


FIGURE 63: System NIO ADOGOOI which protects the spatialship (UEWA) from cosmic dust

origin. The control of the electrostatic potential in each surface unit of the XOODINAADOO is planned in such a way that the charge distribution (electrostatic surface density) can vary from one environment to another until in one area the density reaches only a few tenths of a microcoulomb, despite the fact that this area is surrounded by others of very high potential. The potential function is therefore not constant for areas of the same curvature or bulge; in short, it is not harmonic over the periphery of the vessel.

The reasons for using this flexibility in the electric charge distribution are numerous. First, the density of the assailing particles is not the same for the entire outer periphery. Moreover, as they are oriented in one direction (UYUUNOODII) (cosmic particle wind), it is obvious that they will not have the same kinetic energy impact on the vessel. The abrasion will be more intense in certain areas that will need to be protected with a more intense potential.

Moreover, the cancellation of charge in precise zones, allows, thanks to the secondary effect of

electroluminescence, to make appear in any superficial zone of the vessel, different drawings or graphics visible at a distance by modifying their form at will with the same facility as a terrestrial writing on a slate.

Finally, it may happen that at a given moment the high potential of a zone disturbs any measurement or analysis of a UAXOO (Transducer) in service, in which case the XANMOAYUBAA cancels the disturbing surface charge.

UAXOO AXOO is a nerve center on board the UEWA. As you can see, a large part of the sensory organs is uniformly arranged on the whole area of the XOODI NAA (MEMBRANE). But there are many other devices whose position is centered on this sensory nucleus, located in the very base of the UEWA OEMM . There are also some defense devices. I list the main ones.

Equipment for the reception of electromagnetic frequencies, UULODOO (camera to capture images, which has a function analogous to the cameras of the Earth), Equipment for the remote subterranean prospection, Equipment for the launching of autonomous devices of sounding directed from the UEWA once launched, Recorders of speed in relation to the referential system chosen as model, Receiver of weak gravitational frequencies, spectrographs, acoustic analyzers, equipment for the recording of images of stars and their automatic identification (as a curious fact I would say that the XAANMOO CENTRAL (central computer) possesses in its specialized memory for the identification of sidereal masses, 1226 informative digits for the codification of the structural features - Mass, radiant spectrum for all the frequencies, - Volume, images of its periphery at a standard distance for each one of them, trajectory, situation with respect to a galactic system of reference, foreseen development of its structure, etc.) - We use only part of these digits. When the image (we are not only referring to the image corresponding to the optical spectral band) of a collection, a star, etc., is captured, its characteristics are analyzed in order and suitably coded. The XAANMOO then performs a search process in its memory model until it finds an intra or extragalactic entity that has a sum of physical features very similar to the one being studied. This identification process reaches a period of only a few thousandths of a UIW.

The range of coincidences is so large when comparing corresponding facts that an error is practically improbable (on the order of  $10^{-16}$ ). A second inverse problem can be solved by our equipment: Identification in a sidereal hemisphere of an intra-galactic entity stored in the XAANMOO. For that we "sweep" with the detector all the solid angle of  $2\pi$  steradians by following an ideal spiral trajectory of reduced step (0,002 terrestrial sexagesimal seconds) until locating the sought entity. But for that we use our UULXOODII OEMM system which allows the optical recording of stars at great distances (See NOTE 16 in appendix). Another essential device integrated in the core UAXOO AXOO allows the UEWA to know its position in the galactic system of reference (See NOTE 8).

Note 5:

The three information flow transmission systems are used simultaneously in the Network branches, and the responses require high reliability so that the probability of all three channels failing at the same time is significantly reduced. In the DIAGRAM of PICTURE D, we simulate an AYUU (NETWORK) with two organs between which an INFORMATION must flow.

The three channels of the rings with the respective chromatic shades (YELLOW, BLUE AND ANARAN JADE) represent optical, gravitational and nuclear resonance transmissions.

D and I represent respectively a derivator and an integrator of signals. The latter performs an important function: it compares the content of the same message received by the three channels by eliminating the disturbances coming from a parasite source foreign to the system. (Remember that the transmission times vary for each system, being zero for those in "nuclear resonance"). From now

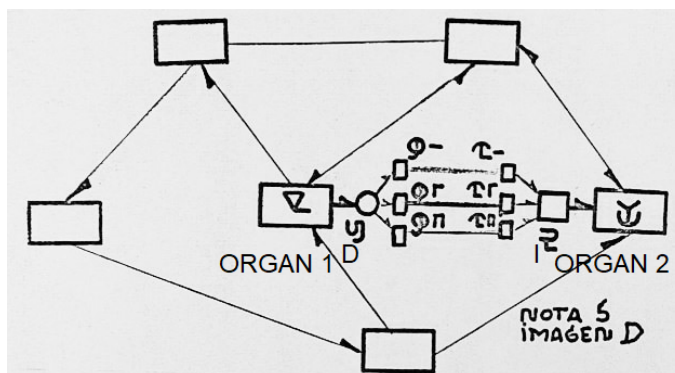


FIGURE 64: Network (AYUU) of two organs between which the information must flow

on, when symbolizing a NETWORK, we will abbreviate the diagram of each branch, representing by a fragmented line or a chain of points (.....) those whose function is INFORMATIVE, or as you say AFFECTIVE or SENSITIVE, AFFERENT etc. If, on the other hand, it were to transmit commands, motor impulses, control signals for control organs, etc., it would be coded with a continuous line (\_\_\_\_\_ ) and you would call these branches: EFFECTIVE; MOTOR (example of the first case: transmitting information about the pressure of a gas, and of the second: sending impulses in the form of a parabolic branch to control a gradient-controlled magnetic field generator).

Not all branches of the NETWORK allow communication through the three systems.

In many cases it is impossible to channel the information flow optically because the glass fiber bundles (see NOTE 3) are a mechanical disturbing element. The transmission of instructions or the sending of motor commands is carried out in each of the channels described by a different coding. In at least two channels, the transmission is carried out by means of an analysis of the frequency components (SINUSOID FREQUENCIES) of the periodic function to be transmitted, or -if it is APERIODIC-, a selection of values is made for a statistical sample. In this way, a series of simple numbers in the duodecimal system is obtained, which in turn are coded for transmission. At least one channel repeats the primitive function without coding it, maintaining a high degree of reliability, so that the APERIODIC function received is a faithful image of the first, and for this reason what you call NOISE LEVEL has been practically eliminated in the case of OAWOENNIU transmission (see NOTE 4) (NUCLEAR RESONANCE).

You will observe that indeed :  $N = \Delta F \log_2 \left( \frac{S}{R} + 1 \right)$  where N is the number of pulses per second,  $\Delta F$  = Channel width (frequency) and  $S/R$  = Power relation between signal and noise.

The informative capacity can be considerably increased (although in our case this capacity is reduced by the use of simple non-binary numbers) by allowing the transmission of complex messages in a very short time. (Unfortunately this is not the case of optical channels because, being considered as an already old system, it is suppressed in some AYUUBAA (NETWORKS))

INTERSTELLAR AND ATMOSPHERIC NAVIGATION

Our OAWOOLEA UEWA OEMM use as reference system our own galactic coordinate system (of the type you call polar). The process to materialize such a frame of reference consists in selecting four sources of radiation in the galaxy, located respectively at a distance of IUMMA (Our Solar Star) in Earth units :

12,382.26 parsecs

19 002.64 parsecs

31.44 parsecs

899.07 parsecs

These are intra-galactic emitting nuclei that our XAANMOO have selected among the most stable (and for other characteristics). Their displacements with respect to the galactic reference system are perfectly known, and thus simple conversion functions allow, thanks to an appropriate calculation process, to locate any problem point inside the ideal reference frame, if the distances to the emitting nuclei are known with enough precision. In practice, it is not this distance that one measures but the trigonometric ratios of the angles that form, between them, the ideal rays from the Problem-Point (in our case: the Astronef) to the radiating sources themselves (SEE NOTE 8) . For that, as we will explain it to you in the Note of the Appendix, the UEWA has four equipments of "DATA ACQUISITION" (UAXOO) which deliver their information to the central XANMOO. Once the polar coordinates of position are "known" by this one, it integrates the sequence of facts relative to a trajectory that the UEWA follows during a certain time, and it is then able to display at a given moment the distance with regard to any Galactic entity (Our UMMO for example). Moreover, this data is used to automatically correct the trajectory by avoiding the zones known as dangerous (High density of cosmolites, intense Radiation, high Temperature near the Stars, etc.). Naturally, such information is added (simultaneously) to the data provided by the other UAXOO organs (DETECTORS). The XANMOO compares the two streams of information. When discrepancies appear (this can be due to the fact that the elements memorized in relation to the galactic configuration were erroneous or that the UAXOO (TRANSDUCERS) are disturbed), at this moment other UAXOO are put in service to confirm the informative reliability of the first ones. The cosmonaut brothers are moreover informed of the existence of this anomaly and can act consequently.

When the UEWA OEMM is in a point where it is necessary to resort to a change of three-dimensional frame, then a phenomenon called by us OAWOOLEAIDAA is artificially provoked. Then, all its subatomic particles located within the enclosure, limited by an ideal surface named ITOOA, are reversed by being able to disappear from the physical control of an observer located within the other primitive frame.

In the new real system of reference, the emissive sources that I mentioned before and that served as "lighthouses" to the Nave, have no more existence for the Nave transported in this new three-dimensional frame, our Galaxy itself ceases to be a perceptible entity by means of any detector instrument as sensitive as it is (at least our science cannot imagine how one could conceive a physical system able to have access to another three-dimensional frame and that brings simultaneously its answer to the first one). But for the space travelers, the New frame, the new "perspective" of the Cosmos (you should not interpret this change of axes as the passage to a "second" WAAM (UNIVERSITY or COSMOS) but as a new perception of this one) is not however isotropic. The new presence of gravitational fields due to the distribution of masses, electromagnetic fields and large nebulae of strongly ionized "infinitesimal" corpuscles, now serve as new provisional road references. The UEWA OEMM had reached, before the OAWOOLEAIDAA, a speed of regime which, with the corresponding increase due to the increase of mass undergone at the level of this phenomenon, constitutes the initial kinematic stage in the new tridimensional system.

At this moment: the central XANMOO memorizes the final references of position with respect to the four mentioned sidero-emitting centers, to, immediately after, select six provisional points of reference in the new frame, which are used to fix the position of the UEWA in a system which is foreign to it. All this information is computerized to calculate at each moment what would

be the new position of the Nave if it returned in the old three-dimensional frame (that is to say the Galaxy which is familiar to us). Of course we know with relative accuracy the mathematical function of the "folding of space" that we call UXGIGIAM ONNOXOO. The errors of evaluation in such a situation of return are of variable sizes (of the order of hundreds of KOAE (1 KOAE = 8,71 terrestrial kilometers) until margins of error of the order of 105 KOAE). These errors are due to :

- The fact that the new reference system chosen in the new framework is arbitrary or imprecise, because it is impossible to fix an absolute reference system with the limited means of UEWA.
- To the fact that the "isodynamic conditions", as we call the aperiodic folds of the WAAM, cannot be calculated analytically with precision. This is what your terrestrial mathematician brothers call today: a "FLAWY PROBLEM". An iterative process of calculation carried out by the XANMOO naturally allows to determine approximate solutions.

Whatever the setting, the Uewa must be accelerated all along its trajectory, both to reach speed regimes that allow it to arrive in the expected time at its various objectives, and to avoid any disturbing physical entity (a gigantic cosmolite for example). The acceleration rates rarely reach values of 24500 GAL, expressed in terrestrial units. Higher accelerations would not only cause disastrous biological effects on the travelling OEMII in spite of their protection systems, but also on the structure and infrastructure of the NEF (I have already described in (note 6) and in the previous paragraphs referring to the OOE phase (FIGURE 56) the nature of these protection systems). The most important problems that need to be solved en route are those derived from the presence of four types of factors that constitute an indisputable danger to the UEWA OEMM :

- High temperatures near stellar cores.
- Intense radiation levels in specific areas.
- Destruction or perforation of the vessel by the impact of cosmolites of different calibers.

The best solution for the first three cases consists of a new OAWOOLEAIDAA, although in the third case, as the presence of dangerous cosmolites can be easily detected at a certain distance, one can make a trajectory modification to avoid it.

Another serious drawback is the continuous abrasion effect that the external area of the XOODINAA (MEMBRANE) undergoes due to cosmic dust. Such a disturbance is negligible during "short" trips, but it is not the same for long journeys. Frictional wear and tear can seriously damage the organs integrated in it. Our vessels have a protective system that I describe in (NOTE 19). As explained in this appendix, the orange colored luminescence that we observe on our UEWA is only a secondary effect of this technical protection.

The entry of our ships into the gaseous crust that surrounds some very rare OYAAs (Cold Asters) presents, as you may guess, another order of serious problems. As I explained to you, Mr. ??????????, the profile of our OAWOOLEA UEWA OEMM is not due to chance and does not obey motives of aesthetics or presence of travelers (SEE NOTE 10).

Note 10:

The structural morphology of our OAWOOLEA UEWA OEMM presents a particular profile which is quite close to the ideal prototype that we call YONNIANA (it is an untranslatable mathematical term).



YONNIANNA is a solid of revolution that we will describe later. Its configuration as a model volume is maximum for the construction of a vessel that is able to invert its IBOZOO YUU to travel in another three-dimensional frame. I have already explained to you that in order to reach the OAWOOALEAIDAA, any mass requires an energetic contribution whose quantity depends exclusively on the value of this inert mass. Of course, after this inversion, this energy is slowly given back in the form of mass, but this is another marginal question.

It is obvious that the energy input does not happen in an instant. In a prior process, different levels of power will be brought in at each instant. Near the instant  $t_0$  of the OAWOOALEAIDAA, the necessary power goes increasing until reaching in certain types of structures very high levels. The POWER function (function of Time) is different for each geometrical type of structure, i.e. it varies according to the profile or shape of the enclosure.

In the images, we have represented seven structures, assuming identical mass for all of them (so that the IBOZOO UU inversion energy is equivalent). See, however, how the power involved at each instant during the interval  $\Delta t$  preceding  $t_0$  (IBOZOO UU INVERSION) varies to reach an inordinate value compared to other models in the DIAMETER cylinder case. = APOGUE (There is a special case not represented in the series: REGULAR TETRAEDRUM; for a mass in polyhedral configuration, the power required at time  $t_0$  tends to infinity, while  $\Delta t$  becomes practically zero. There is no need to suggest that a ship built with such peripheral structuring is infeasible.

The series of IMAGE A (FIGURE 65) was ordered according to the criterion of classifying the profiles according to the "Maximum Power Required" to obtain the OAWOOALEAIDAA.

The most suitable structural type is, as I mentioned above, the YONNIANNA. Unfortunately, incompatible operating requirements demand that the profile be forced to a shape that, while retaining some features of the former, can at the same time fulfill other multiple simultaneous requirements in relation to intragalactic navigation and the function of on-board equipment. YONNIANNA is the name we give to a solid of revolution whose semi-profile is expressed analytically by a very elementary function that you surely know :  $y = -e^{-\frac{1}{x^2}}$  (YONNIANNA: two plates superimposed on each other in opposite directions).

If the YONNIANNA were expressed by a volume, the hatched surface of the image B would be the resultant of the reproduction on a plane of symmetry AB, of the solid of revolution while turning on the axis of rotation of the ordinates (y,-y). The equatorial plane would be defined by the value  $y=1$  and the volume would theoretically extend to infinity. On the other hand, this or another profile is valid for navigating in galactic space. When I refer to the OPTIMAL PROFILE, I express it in relation to the smallest "maximum power", necessary to invert its sub-particles, but unfortunately this is not the case when it comes to a flight within a viscous fluid like the air you are familiar with. (Observe that the second structure in the list represents a cylinder ending in two ogives) Naturally the profiles in PICTURE A are selected as random samples.

Their morphology corresponds to the design to be as close as possible to the ideal structure which allows an OAWOLEAIDAA (TRANSFER OF THE TRIDIMENSIONAL SYSTEM) with a minimum of power necessary at the moment  $t_0$ , but for that it is necessary to sacrifice a structural configuration which would be otherwise ideal (aerodynamic thinness) for the displacement in a viscous fluid as can be the atmospheric air.

This geometrical form of the Astronef, little in agreement with the postulates of aerodynamics, for a structure which must in many occasions move within gaseous layers with very different characteristics (chemical composition, temperature and density), must absorb a new series of unavoidable problems that an aerodynamic design would reduce considerably.

Indeed: when one of our UEWA penetrates the densest layers of any atmosphere with speeds that

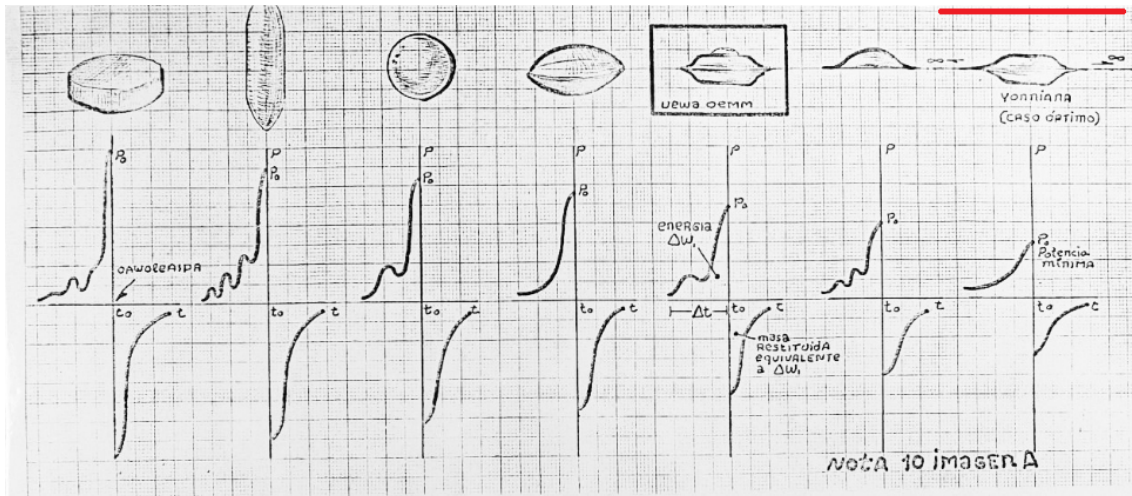


FIGURE 65: The POWER function (function of Time) is different for each geometric type of structure (PICTURE A), i.e. it varies according to the profile or shape of the enclosure.

you would qualify as hypersonic for this fluid, the heat transferred to the XOODINAA both by the shock layer and by the boundary layer (I use terms that are familiar to you because our concepts of fluid mechanics are formulated in a different way) could not be absorbed - despite its high ablation capacities - in borderline cases without many organs deteriorating and even without its surface melting. Moreover, the energy losses would be very high because it is not possible to geometrically shape the UEWA profile so that the laminar regime of the "boundary layer" is controlled, so that in certain phases it would become turbulent.

In summary, the whole problem comes down to controlling or obtaining a rigorous control of what you call "BOUNDARY LAYER and SHOCK WAVE" without modifying the profile of the vessel, so that:

- can be controlled both the velocity gradient in the whole section of the boundary layer and the thickness of the latter within precise limits, thus preventing the undesirable passage from the laminar regime to the turbulent regime.
- can be controlled for each velocity, the actual distance of both to the XOODINAA (MEMBRANE) so that the heat transfer is bearable in the most unfavorable cases.

Let us stop on the shape of the spaceship because this point is very important. The objective function is the POWER in absolute value necessary to the mass inversion of the spaceship. So we want this POWER in absolute value to be minimal at a given time  $t$ . We notice that the POWER function is quasi-symmetrical with respect to the origin ( $t=0$ ) but that it can present oscillations in the part of negative time  $t \leq 0$ . For  $t \geq 0$ , the power is negative and grows sigmoidally towards 0. We try to get closer to the shape of the vessel for which the power in absolute value is the lowest (optimal shape on the right) because the convergence to 0 when the time  $t$  will increase will be smoother, and thus the mass inversion and its restitution will require less power.

It is an important point of the Ummite letters, we see that they lied because the function they gave does not present an inflection point which is however clearly visible on the image A where

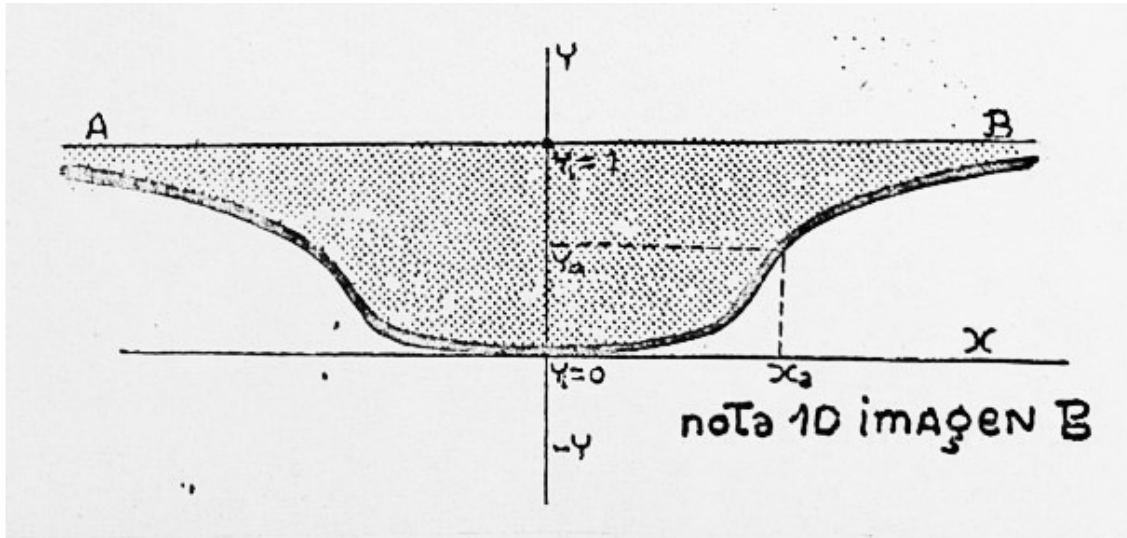


FIGURE 66: Representative curve of YONNIANNA given by the Ummites (PICTURE B), i.e. the shape of the spacecraft enclosure  $(y,-y)$  where  $y$  is the upper plate and  $-y$  is the lower plate.

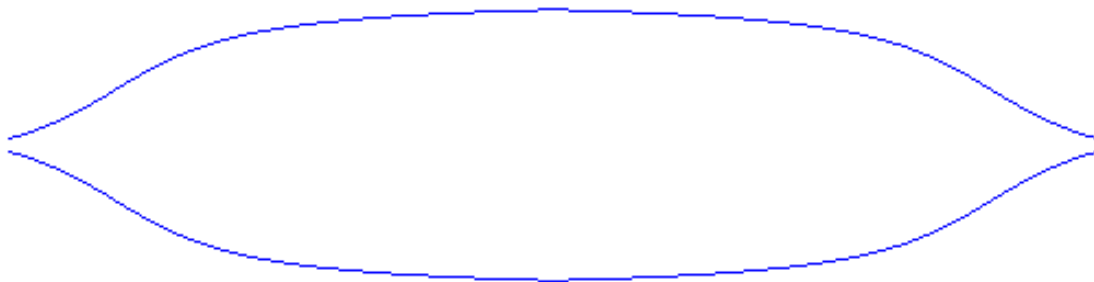


FIGURE 66A: Real representative curve of the function YONNIANNA (PICTURE B), using the usual function:  $y = \frac{2}{\pi}(\text{atan}(-0.4|x| + 4.5) + \frac{\pi}{2}) - 0.4$  for all  $-14 \leq x \leq 14$  and the shape of the spacecraft enclosure is  $(y,-y)$  the two plates superimposed on each other;  $y = -e^{-\frac{1}{x^2}}$  is wrong.

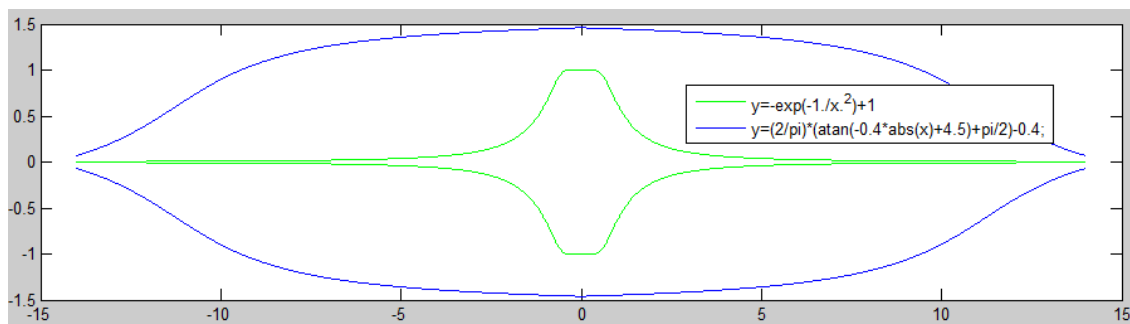


FIGURE 66B: Comparaison between our function:  $y = \frac{2}{\pi}(\text{atan}(-0.4|x| + 4.5) + \frac{\pi}{2}) - 0.4$  and the Ummite function  $y = -e^{-\frac{1}{x^2}} + 1$  for all  $-14 \leq x \leq 14$ , the Ummites intentionally lied.

the person applied himself to a well tracing the curve and well to put in evidence the points of inflection of the curve in reversed bell. Among the usual functions, there was the inverse function of the tangent function, which was odd and had an inflection point at 0. An inflection point is a point where the representative curve of a function changes its convexity. The convexity of a function on an interval is related to the sign of the second derivative on this interval. So if the second derivative changes sign at a point, then the function changes convexity at that point. The Arctan function was the ideal candidate, since its derivative defined and derivable on  $\mathbb{R}$  is the function  $\text{Arctan}'(x) = \frac{1}{1+x^2}$ , it is strictly increasing on  $\mathbb{R}$  and its second derivative is the function  $\text{Arctan}''(x) = \frac{-2x}{(1+x^2)^2}$  which changes sign in 0, so there is indeed a change of convexity in 0 for the Arctan function.

This long letter concerning the technology of the spaceship to travel between the stars does not reveal any technological secrets, but we guess all the same that the principle is based on the interaction of the particles between them for the external envelope of protection and for the central computers which pilot the travel and the operation of the spaceship, therefore based on quantum entanglement. The three-dimensional reference frame changing system requires energy, and therefore power, to invert mass by modifying the phases of subatomic particles and the shape (YONNIANNA) of the spaceship makes it possible to reduce the power necessary for this passage in the twin universe. The gravitational magnetic field allows the object to float in the air and suddenly accelerate without making noise. The spaceship speed can approach a non-negligible fraction of the speed of light by enveloping subatomic particles in an angular array of photons (lithium plasma varying at very high frequency). But the Ummites, in order not to be taken seriously by the scientific experts who read this letter and who at the time were very far from quantum computers and the experimental deepening of quantum mechanics, intentionally muddled the waters. on a mathematical function that we see in high school. First they forgot the sign  $-$  in front of  $e^{-\frac{1}{x^2}}$  but that's just to test the reader's insight. But the function that the Ummites give (in Green on FIGURE 66B) does have 2 inflection points but which are too close together to represent the shape of their UEWA nave.  $x \mapsto -e^{-\frac{1}{x^2}} + 1$  has for second derivative  $x \mapsto \frac{(6x^2-4)}{x^6}e^{-\frac{1}{x^2}}$  which is equal to 0 and changes sign for  $-\sqrt{\frac{2}{3}}$  and  $\sqrt{\frac{2}{3}}$  ( $\approx 0.81$ ).

The problem is that these 2 inflection points are too close to each other to find the shape of the Ummite nave, we can see it clearly on the graphical representation of this function.

The function  $x \mapsto \frac{2}{\pi}(\text{Arctan}(-0.4|x| + 4.5) + \frac{\pi}{2}) - 0.4$  that we propose is positive for all  $-14 \leq x \leq 14$ . It is defined, continuous on  $\mathbb{R}$ , indefinitely derivable on  $\mathbb{R} - \{0\}$ , its second derivative is given by

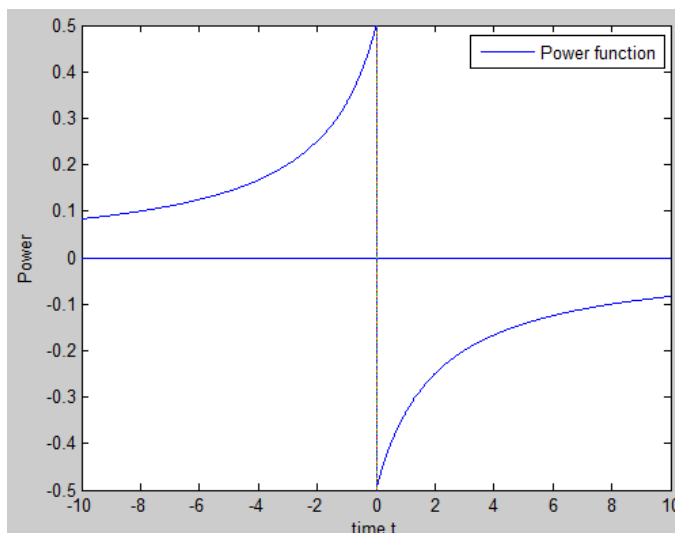


FIGURE 66C: POWER function corresponding to the geometry of the YONNIANNA function

$x \mapsto \frac{-1.6(4.5-0.4|x|)}{\pi(1+(4.5-0.4|x|)^2)}$  which is equal to 0 and changes sign for  $x=-11.25$  and  $x=11.25$ .

We can see that the two inflection points are further apart, so the oval shape is much flatter (see Blue curve in FIGURE 66B) and corresponds to the shape given by the Ummites 50 years ago. Our YONNIANNA function has an angular point in 0 because the absolute value function is not derivable in 0. The left derivative is equal to the slope +1 and the right derivative is equal to the slope -1. Our function has an angular point in 0 because the absolute value function  $x \mapsto |x|$  is not derivable in 0. At the point  $x = 0$ , the left derivative is equal to the slope +1 and the right derivative is equal to the slope -1. Connecting the two Arctan functions for  $x \geq 0$  and  $x \leq 0$  is easy, we can stretch the graph to decrease the scale of the y-axis and we get exactly the shape of the Ummite ship and the angular point at 0 becomes imperceptible (FIGURE 66A and FIGURE 66 B). Our YONNIANNA function is 1.4075 for  $x = 0$  and its left derivative in 0 is 0.0119 and its right derivative is -0.0119; so as the slope is gentle on both sides, the angular point is not very strong and the continuous connection in 0 is not a problem. The derivative function is the function  $x \mapsto \frac{-0.8}{\pi(-0.4|x|+4.5)^2+1} \text{sign}(x)$  defined everywhere except at 0 (angular point, derivative on the left and on the right at 2 different opposite values) it is strictly positive for all  $x < 0$  and strictly negative for all  $x > 0$ .

Consequently, our function is well strictly increasing for  $x < 0$  and for  $x > 0$ , verification made.  $y = \frac{2}{\pi}(\text{Arctan}(-0.4|x| + 4.5) + \frac{\pi}{2}) - 0.4$  is the upper plate and  $y = -\frac{2}{\pi}(\text{Arctan}(-0.4|x| + 4.5) + \frac{\pi}{2}) + 0.4$  is the lower plate. We deduce that the Ummites did not give the good function which minimizes the function POWER necessary to the restitution of the mass.

The minimum optimal POWER function (FIGURE 66 C) corresponding to the nave shape defined by YONNIANNA is given by  $\begin{cases} \frac{1}{2-t} & \text{if } t \leq 0 \\ \frac{-1}{2+t} & \text{if } t \geq 0 \end{cases}$ .

The Ummites like to create smoke in their letters, from time to time they write false things about simple equations in order to discredit the whole. A part of the discrediting comes from

information which is not verifiable because it is too far ahead of the knowledge of the 20th century and the beginning of the 21st century, and the other part of the discrediting comes from false things which any student of MASTER level can verify that it is false, it is for example the case with this function YONNIANNA. That's why some university professors, in mathematics or in physical science, thought after reading these documents that it was the work of a doctoral or master student with a little imagination. But as Bonaparte said: "imagination rules the world".

The Ummite mails come from many different countries and cities which means that they have traveled all over the world. The Ummite texts are strewn with Ummite words (ex: OYAGAA, WOA, YONNIANNA,...) that we use in this work. This allowed Antonio Moya CERPA, a Sevillian ufological researcher to make a French/Spanish/Ummite dictionary of the integrality of the Ummite words used in these documents There was a seminar at the University of Seville, where the scholars gathered said that it is a language that can function as a language, it is a valid language. On the basis of the letters, it is difficult to speak of an ummite language. All that we have, apart from some complete sentences, is a lexicon, a set of vocables of which the immense majority is given to us in isolation. Antonio Ribera mentions 403 Ummite words in a compilation made in 1978 and Jean Pollion, in the book "Ummo, de vrais extraterrestres" (2002), lists more than a thousand words considering that each doubling of a letter in a word is significant. Two theories have been formulated by analysts of Ummite letters:

- the first, defended by Jean Pollion, considers that each letter (sound or phoneme) of the words transcribed in typewritten form is significant and he called these sounds "soncepts". He considers that it is about an "ideophonemic" language: "By analogy with the ideographic languages, which proceed by assembly of ideas corresponding to written and pronounceable signs, I chose to allot to this language the "ideophonemic" character. I counted to date 17 phonemes and a "phonological" process, as well as some "syntactic" rules. The Ummite expresses itself by associative combinations of these phonemes, almost all of them relational.
- The second considers that the differences in spelling (especially the repetition of letters) are not very significant and that they are due to differences in the understanding of foreign sounds by the typist(s), or to the difficulties of alphabetic transcription. They consider that the language is indeed formed of word-objects and not of "concepts".

For C. P. Kouropulos, "To speak of an ummite language is abusive: only a sprinkling of exotic words and a few rare simplistic phrases are known. We do have a vocabulary built according to an ideogrammatic logic, but not a language! For Dominique Caudron, one can "conclude that the alleged "ummites" do not master the "ummite" language, whose grammar they seem to ignore". According to the opinion of Aimé Michel in the collective work *Les Religions: origine et actualité*, published in 1972, "the supposed language of Ummo is of Indo-European structure, which goes in the direction of the forgery elaborated by amateurs". The name Yohana is of Slavic origin. It is also written Yohanna. It means "ethics, morals" in this language. It strongly resembles the term used YONNIANNA for the optimal shape of the spaceship, so indeed the structure makes think of a Slavic or Indo-European language.

As we have already seen, "ummites" communicate mostly with humans by letters, but these letters are not written in "ummite" (because they would be as hermetic as the linear B of the Cretans), but in Spanish, or even in French with Hispanicisms. It would be a bit like "This is Ummo, the Spaniards are talking to the Spaniards" if the letters were not enamelled with "ummite" words, at least their phonetic pronunciation. To have an idea of the verisimilitude of the process, let us

imagine that in 1957 a "Russian scientist" (in reality a scientific journalist from Ogoniok) writes to a Frenchman, a fan of the magazine "Sputnik", to speak to him about the marvels of the Soviet space technique. Would he write to him in good French (educated Russians are good at French), or in a clumsy French, studded with Russian words written in Cyrillic capitals. In good French of course. The second solution could only be the work of a prankster, taking advantage of the barrier of the iron curtain to give fanciful information while looking very Slavic. It is however to a parody of this solution that the "ummites" have given themselves since their first letters, never giving more than phonetized words, with their translation, and almost never, as one could expect, to complete "ummite" sentences, as a quotation. We can conclude that in fact the so-called "ummites" do not master the "ummite" language, whose grammar they seem to ignore. To take our example again, it is as if our prankster was in fact a Frenchman with a Russian dictionary, and only the dictionary. And in this case, we are not even sure of the existence of this dictionary. But precisely these dictionaries exist because Antonio Moya Serpa and Jean POLION did it. However, the Ummite language is a strange dialect for someone who is new to the subject. Let's imagine that we receive a message like this:

OEMMII OIAGAA GAEOAO AIOOIAO OEMII UIAA OEMII EABAYO UAMM...

What's that? What is this gibberish? It doesn't sound like any known language. At least, not known to us, western readers. There are too many vowels (the opposite of Polish, that is...). Well, that would be "ummite". It would be, because in fact, it is one of the only sentences in "ummite", that we know... if there is a sentence! Because one can wonder if the "ummite" language really exists. While we know texts written in Bâavien, we only really know part of the "ummite" language's vocabulary. This vocabulary enamels the "ummite" letters like "initials" decorating an old parchment. Which gives this: "When we note the hypothesis of the WAAMWAAM (PLURICOSMOS), it is because we observe that in our UNIVERSE and in the UWAMM (complementary COSMOS of inverse electric charge), there is a very reduced number of possibilities of existence EAAIODI GOO (ONTOLOGICAL)." But is this really how one writes to a foreign correspondent?

Of course, the "Ummites" do not use our Latin alphabet, these strange words are only a phonetic transcription. On their planet, they would have their own writing. To make their letters more "real" (well, more exotic), they let themselves go and write some words in the script of their planet, a script that evokes rather a thousand-year-old oriental script, than that of a civilization far ahead of ours (a bit like Alberto Sanmartin's stone looked like it came out of an Egyptian tomb rather than a saucer). The symbol Ummite  $\text{)+(}$  signed on all letters does not resemble any known symbol except the symbolic representation of the sign Pisces in astrology:  $\text{X}$ . The ummologists have been working on listing these "ummite" words. Antonio Moya Cerpa, compiled a dictionary of 403 words in 1978, in the hope that they could be used for linguistic analysis. Ignacio Darnaude submitted this dictionary to Don Antonio Vidal Lamiquiz, professor of linguistics at the University of Seville. He decided to organize a round table discussion with about thirty people. Although the sample seemed to be large, the conclusions were mainly based on its deficiencies. There was a lack of structured sentences, phonetics, nonsubjective words, and the logic of the language. In short, the final conclusion was that nothing could be affirmed.

Attempts at deciphering

However, by examining the morphology of the "ummite" vocabulary, it seems that, subject to transcription errors, it is constructed quite simply by assembling simple elements. Thus:

OOYIA = hot star

OOYAA = cold star = planet

GAA = square

OOYAAGAA = planet of the square = the Earth  
 WOA = creator = God  
 OOYAAGAAWOA = God of the Earth = Jesus Christ  
 From which in reverse direction we deduce: OOY = star  
 IA = hot  
 AA = cold

Eureka! We begin to decipher the "ummite" language. Can we go further?

Yes, answers the pseudo Jean-Pollion, who would have analyzed 1345 "ummite" vocables. Behind this evocative term hides a French scientist, living in Belgium, but publishing in Switzerland (that's why it takes so long to appear in France). He claims that we can deconstruct the vocabulary at the level of the letter, considered as ideophonemic representation of the elementary linguistic unit of the "ummites": the "soncept". Thus while our smallest semantic units are syllables, those of the "ummites" are letters. Eureka! Jean Pollion has just proved that "ummites" use a type of language unknown on earth. The "ummites" are therefore real extraterrestrials! Of course, one may wonder how Jean-Pollion - who is not a linguist - knows that this system is unknown on Earth. It is simply unknown to him. Of course, the bad tongues will point out that Jean-Pollion has just reinvented hot water by rediscovering the principle of the Hebrew kabbalah? Of course, we can notice, with Jean-Michel Abrassart, that if we follow the author in his reasoning, and knowing that W = information, O = being, and A = real, we find WOA (God) = "information which makes the real exist", but also many other translations. Indeed, according to the same author, we would also have W = variation, change, event, novelty and modification. O = entity, creature, existence, dimensional reality and component. A = truth, reality of fact, activation, action, validation, active validation, act, experimental verification and effectiveness. That is a total of 420 possible translations! We would have for example: "Change of a component of truth", which would be more a definition of religion than of God.

But it gets worse. Letter-to-letter semantics is indeed a human creation. It does not date from yesterday, since it appeared in the 17th century in the context of the search for a universal language, the Holy Grail that men have been looking for since the Tower of Babel. But to know it, you have to be a linguist, and preferably a specialist of synthetic languages, such as Solresol, Volapük or Esperanto (more than one thousand synthetic languages have been identified). By wanting to unify the language, humans have only "babelized" more Thomas Urchard Urchard the precursor. Such a system was indeed imagined and published in 1653 by the Scottish Thomas URCHARD, in "Logopandecteisio, or an Introduction to the Universal Language". In this system, each letter of a word had to have a meaning, so that they could be interchanged without any inconvenience. This is the principle of the philosophical language dear to LEIBNIZ But URCHARD had given neither dictionary nor grammar. It was up to another Scotsman, George Dalgarno, to fill this gap in order to create an operative philosophical language Dalgarno used a system of classification of ideas (a bit like Dewey later, for libraries) which he arranged in 17 supreme classes which were divided into sub-classes, by the variation of the second letter. Four letters called "servile" contributed to the formation of words without having a determined meaning The language of Dalgarno was not used, because to find without error the meaning of a word, it was necessary to know by heart all the logical classification, that is to say in practice all the dictionary. Nevertheless, the principle of the meaning letter by letter, was known on Earth for a long time. Exit the proof of the "exogeism" of the "ummites. Sorry, how do you spell "planet"?

The above analyses assumed that there was no transcription error. Of course, we check this fact for a word often quoted in the "ummites" letters, the word "planet", for which we also find "cold



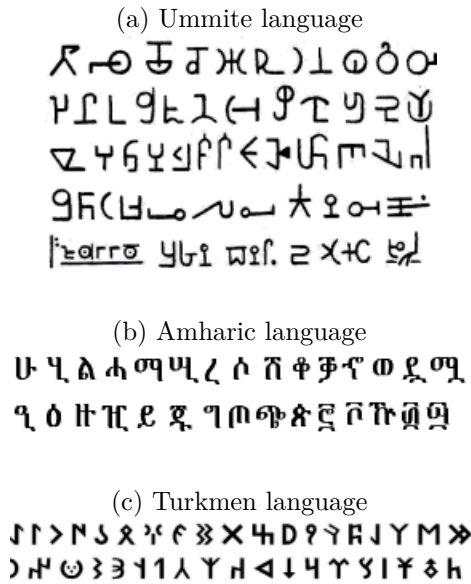


FIGURE 67: Comparison between the Ummite characters (Top), the Amharic characters, and the Turkmen characters, the Ummite symbols are geometrical, and we often find the circle  $\odot$ , the  $\perp$   $\top$  symbols, the measure of angles  $\sphericalangle$ , the intercal  $\top$  or the multimap  $\rightarrow$  as the base of the characters

star", or "solidified" star and even "cold planet". Patatras, everything collapses, in the only letters available on the Web, we found: OIAA, OIIAA, OOIAA, OOYA, OOYAA, OYA, OYAA, OYIA, OYIAA... ...that is to say almost all the possible combinations. OYAYA! This is a catastrophe. Let's check for the word "star": OOYA, OOYIA But it's not true! Not only do we not know how to spell "planet" (we'll say it's the typist's fault who typed the letters "ummites") but the "ummites" don't seem to distinguish a star from a planet... But where do these carnival aliens come from? As a result, since we no longer know how the words "ummites" are really written, it becomes totally illusory to attempt a semantic analysis letter by letter. Gone is the brilliant Champollion theory of the "ummite" language. We dry on the "ummite". But we still don't know if there really is an "ummite" language. One can already doubt the alleged "ummite" sentences. Let's pass again for: AYHIO-NOOXOE-OYAA-DOEE-USGIGIAM Which could be translated: "This greenish planet seems to float in space".But one reads something like this:

OA DO DO IA KAAWAEA UMMO UMMO

explanations of "ummites":

OA: we have made this journey (in two letters? clever...)

DO : and we come from

IA KAAWAEA : to study your culture

UMMO: our planet.

So we would translate:

"we made this trip, and we come from, and we come from to study your culture UMMO UMMO UMMO" Well no, we have to translate:

"We have made this trip from UMMO to study your culture, and We think we are not hurting anyone, rest assured."

Really? Well yes, the repetition of a word would mean something. They call it "bi-language" (as if it didn't exist on Earth) demonstration:

DO UMMO DO DO UMMO UMMO DO DO DO "We come from UMMO, and We arrived over France with our nave."

That with two semantic elements?! It's like Morse code, then? (in Morse code it would be ETI7 for example. Nice try ETI7, - son of ETI5 - but it doesn't work)

Of course there are fantasies in every language. Like in French the story of the 3 fools (no buckets, oh and then zut) or a sentence beginning with "Si Sissi scie six...".

The Chinese language manages to make a sentence with 8 times "Fu", because the meaning is in the rhythm and intonation. But precisely the writing is phonetic here (and dictated "recto tono") so the extraction of another meaning is impossible here.

Moreover, we have seen that in "ummite", the meaning is obtained from very meaningful syllables (except that we do not know the exact spelling). This is completely contradictory with this repetition process, just good (if it were possible) for making puns. Come on, ummites, let's do as the Chinese do: DO DO DO DO DO DO DO DO, what does that mean to you?

So, we're not really sure that the "ummites" can make real sentences with their supposed vocabulary. We are not rigorously sure (because of imprecise spelling) that this vocabulary obeys precise morphological rules. One wonders where its strange sound comes from, which would certainly be quite normal from aliens. We will explore the new tracks. We can notice with Jacques Scornaux that the letters less frequent in Spanish are actually very frequent in "ummite". With the exception of the O, frequent in "ummite" as in Spanish (but only in the final). It's as if they wanted to create a vocabulary that would be as exotic as possible for a Spanish reader, or as if the writer was a Spaniard who didn't want to look like one. Another element goes in this direction: the letters "ummites" in French contain Spanishisms. Thus, instead of writing "l'importance", the "ummites" write "la transcendence", because in Spanish "importance" is said "trascendencia". In the same way, they write "the brightness" instead of "the brilliance" ("brillo" in Spanish) and write "sistema" for "system" ("sistema" in Spanish). For Bertrand Meheust, the linguistics of Ummo seems to be inspired by the SF novel of Ian Watson "l'enchâssement" Enshrinement is a process of inserting parentheses within parentheses to the point of losing the thread of discourse. In Ian Watson's novel, a tribe transforms, under the effect of a drug, its common language, xemahoa A, into an embedded language, xemahoa B, in which its myths are transmitted. Its study interests extraterrestrials who seek to elaborate a universal grammar from different languages in order to discover a transcendence allowing access to the Other-Reality. Have the "ummites" read "the embedding"? In any case, the "ummite" vocabulary seems to have a double function: firstly, to disorientate the victim cognitively (a process used by all the sects that know their trade). Secondly, to give a very exotic taste to a too mediocre literature. Exactly as in the case of small-scale anticipation novels. Take a banal spy novel, replace Nicaragua by the planet Zarkon, the corrupt officials by the priests of Usschar and the KGB agents by androids controlled by the guardians of the order of Xilith, you get a space opera novel. And we still don't know where the "ummites" found their inspiration to make those characteristic over-spelled syllables. Some have thought of African consonances. It is true that "UMMOAELEWE" sounds African. But XANMOO XOGUU is less obvious. Godelieve Van Overmeire, who would have spent 10 years in the Congo, dismisses the African track. But she found another one in an English - Chinese (Mandarin) dictionary. Many "ummite" words would have a correspondence in Chinese. In this hypothesis, the author of the "ummite" letters - which are not written by extraterrestrials, that's for sure - would be a Spaniard who would have made a small "ummite" dictionary for the use of the gogos, inspired by a Chinese dictionary, to make

it more exotic Here again, he would have only copied on the "Baal contrat" which also found its inspiration in China, but this explanation, too terrestrial, has been contested, in particular, of course, by the supporters of the hypothesis of the real ummites, who came in their real machines. However, if we can contest the hypothesis of the Chinese inspiration, it is mainly because there is another one, just as terrestrial, but which seems better: Vincent Morel, who prides himself on knowing about linguistics, has found that there is a closer relationship with the oriental branch of Austronesian languages. Thus, "UAEXOEE IANNO IAUAMII IE OEMII" would be inspired by "waeshoe yanno yawami ye oemi" (we have to take into account the numerous transcription errors, as we have seen above). Therefore, it is not a Mandarin Chinese dictionary that the author of the ummite letters would have used, but rather a Tahitian or Hawaiian dictionary. It must be admitted that the exotic sound of these Austronesian languages is ideal for passing themselves off as an extraterrestrial community. Unfortunately, the author of the ummite letters is deceased, so it is no longer possible to confirm this interesting hypothesis.

For example Shannon Marie Kahoolani Sossamon (born October 3, 1978 in Honolulu, Hawaii) is an American actress and musician of Oceanian origin holding roles in cinema and in music videos. She is of Hawaiian origin, very beautiful woman, on whom I fantasized during my adolescence precisely by listening to the group Blink 182, whose former member Tom DeLonge devoted a large part of his time to politics, conspiracies and particularly the UFO research that made him put his career aside to devote himself to it. He threw all his weight to force the US army to declassify sensitive videos of unsolved UFOs. If we compare the two words of 9 characters "KAAIOEMMI" which means "FRIEND" in the Ummite language and the Hawaiian name of Shannyn Sossamon: KAHOOOLANI, we identify the repetition of 2 letters (OO) or (AA). The Hawaiian language is the only terrestrial language where we find this particularity of the Ummite language.

For about 800 years (from 1000 to 1778), Hawaiian was the only language used in the Hawaiian archipelago and was not spoken anywhere else. In 1778 the British landed with navigator James Cook. Cook was accompanied by Germans such as Johann Reinhold and Georg Forster. During the following years, the island will be visited by many expeditions from the old continent or through the nearest settlements. A first French scientific expedition left on 1 August 1785 and made a stopover in Hawaii on 30 May 1786, two years before his return to Brittany on 10 March 1788. The commanders of the two ships were Lapérouse and Fleuriot de Langle. Aboard the Rurik brig, the voyage of scientific exploration was carried out in 1816 by a Russian team composed of many other nationalities such as the famous German writer and naturalist, Adelbert von Chamisso, accompanied by the German doctor Johann Friedrich von Eschscholtz and the French naturalist painter, Louis Choris, who will also recount his journey with many illustrations in the book *Voyage pittoresque autour du monde*, some of which show the pre-colonial Hawaiian culture. As mentioned above, Chamisso will also be interested in the Hawaiian language by giving a lecture on its grammar at the Berlin Academy of Sciences a few years after his return. The arrival of the Chinese is attested from 1778 and until 1900, as the first agricultural workers in the sugar cane plantations created in the archipelago. As men came alone, mixed marriages with Hawaiian natives contributed to their integration. They were joined by the Portuguese in 1878, mostly from Madeira and the Azores, hired by the Hawaiian Sugar Planter's Association, which also recruited from among the Japanese from 8 February 1885 on the basis of a bilateral agreement with the Emperor of Japan. It was the Spaniards who took over from the Portuguese in the sugar cane plantations with an arrival of tens of thousands of people, adults and children, between 1907 and 1913. Before them, the polyglot Spaniard, Francisco de Paula Marín, had already arrived in 1794 in Hawaii, known for having created the first vineyard in the archipelago and promoted to officer in the Hawaiian army by King

Kamehameha II for his loyal service to the sovereign. He is not the only European trader and entrepreneur to have set foot in Hawaii in a spirit of discovery and respect for the local ancestral culture. The German merchant of the Hanseatic city of Bremen, Friedrich Hackfeld, will be very involved in the Hawaiian economic life of the reign of Kamehameha IV, of which he will advise. Hackfeld settled permanently in Hawaii in 1848, and his son took over his company when he died. Hawaiian appeared at the same time as the Marquis, the language of the Marquesas Islands, and Tahitian, around the year 1200, when speakers of Polynesian languages discovered the Hawaiian archipelago and established permanent colonies there. The separation between these Polynesian settlers and their native lands led to a gradual change in their language, thus developing Hawaiian which is now distinct from the Tahitian. Before the year 1000, this language was proto-Polynesian. Further back in time and space, it was one of the languages in the Philippines, descended from an ancient Austronesian language spoken in Taiwan about 6,000 years ago. The language of the same family farthest geographically from Hawaii is Malagasy, spoken on the island of Madagascar, about the other side of the globe compared to Hawaii. The ancient Tahitian language was isolated in Hawaii from the rest of the world for 700 to 800 years. In 1778, the English navigator James Cook was the first European to discover Hawaii, marking a new stage in the development and use of Hawaiian. During this period, until 1820, it began to take the form of a written language, but largely restricted to isolated names and words collected by explorers and travellers. Hawaiian is one of the Austronesian languages, more precisely the Marquis languages. It is therefore similar to other Polynesian languages such as the Marquis, Tahitian, Samoan, Maori or Rapanui. It is also close to Fijian, and less clearly to Indonesian, Malagasy and the various Formosan languages of Taiwan and the Philippines. It is a language that is in danger of disappearing because it belongs to the list of languages in critical situation of UNESCO of which it is estimated that only 1,000 people speak it as native speakers in 2000: on six of the seven inhabited islands, the Hawaiian language has not been used on a daily basis since Anglo-American colonization. It should be noted, however, that the Ni'ihau dialect is an exception: it has never been altered or weakened, and its speakers still use it every day. But then precisely, if we refer to UNESCO there is only a very negligible, if not no, number of the world's terrestrial population whose native language is Hawaiian, and as luck would have it, it is the only language which has the same peculiarities as the Ummite language, and we know that the Ummites letters were sent from many different countries signed with the same pictogram which resembles no known symbol of any language. So the probability that the forger behind these letters was inspired by the Hawaiian language that very few people know and master is very low. This is why the skeptics citing the Hawaiian language as the main source of inspiration for the forger, in spite of themselves, feed the extraterrestrial hypothesis but in fact they confirm it. Before becoming Hawaiian around the year 1000, the language was essentially identical to the Tahitian or Marquis of the time, less differentiated than now. Further back in time and in the family tree of the Austronesian family, the language was several stages of proto-Malayo-Polynesian. Even longer ago, the language was that of the Philippines. Language studies, with methodologies for the study of vocabulary statistics and comparative reconstruction, bring the language to the proto-Austronesian, spoken in Taiwan. There is a genetic relationship between the Austronesian and Austroasian families. The Austronesian people migrated from China to Taiwan about 6,000 years ago. For this reason, the ancestors of the Hawaiians come from the Asian continent. The Hawaiian language is spoken almost exclusively in the Hawaiian archipelago. There are approximately 1,000 speakers, but this estimate varies by source. How can you imagine a people so isolated, and so few in number, being at the origin of this Ummites vocabulary. The reroute of this language, its destruction by English and American settlers, ruled out this assumption. The Ummites have

therefore adapted their language to the "western alphabet" A,B,C,D,E,F,... after learning English, French and Spanish and so we find that there are repetitions of two letters at a time and that this language works by syllables. Each syllable consists of an optional consonant and a vowel, monophthong or diphthong. Monophthongs and diphthongs are elongated no. There are only 162 different syllables in Hawaiian, which is much lower than most other languages. Nevertheless, the predominance of vowels strikes anyone discovering this Polynesian language. Monophthongs and diphthongs are elongated no. There are only 162 different syllables in Hawaiian, which is much lower than most other languages. Nevertheless, the predominance of vowels strikes anyone discovering this.

In terms of phonology, we note the small number of phonemes (only eight consonants: /h, k, l, m, n, p, w, ?/), a characteristic shared with neighbouring languages. A highlight is the lack of difference, originally between the [t] and the [k] for/k/l. The dialects of Kaua'i will speak more readily [t] whereas in Honolulu this consonant is pronounced [k]. It is finally [k] that was imposed during the reign of Kamehameha I (1810), which carried out the conquest of all the islands: once again, the Ni'ihau dialect has preserved the ancestral [t]. The /w/ is pronounced [v] after /i/ or /e/ but [w] after /u/ or /o/. After /a/ and at the origin of a word, [w] and [v] are the two correct ones. For others, the /w/ should not be systematically pronounced in English but more often as in French the /v/. This is one of the most recurring questions from English-speaking learners in Hawaiian online courses as some Hawaiian words are sourced from English. Contemporary Hawaiians have become accustomed to pronouncing /w/, as in English, by mimicry without it bothering them. Referring to 19th-century Andrews grammar, the /W/ was sometimes written with /u/ as «naueue» instead of «nawewe». The francophone does not feel this conflict because the pronunciation of the /V/ suits him a priori. To the extent that the many sources that speak of Hawaiian are English-speaking and that Hawaiians have lived with an adstratic connection to Americans for centuries, the non-English-speaking observer must be more cautious. There are five monophthongs (/a, e, i, o, u/) and nine diphthongs (/ae, ao, ai, au, ei, eu, oi, or iu/). Vowels within a diphthong are usually pronounced separately, but it is clear in online video lessons that the /e/ in the pronoun "OE" ("YOU" in ENGLISH) is somewhat reduced to a schwa in the oral current language in / / or the /u/ of the pronoun «au» («I» in French) is closer to the semi-vowel /w/. The vocal character of the second vowel in a diphthong remains evident; therefore, Hawaiian diphthongs should not be confused with English, German or French diphthongs, for example. We know that OEMMI: HUMAN LIVING BEING in Ummite language. The plural seems to be signified by a doubling of the I which gives OEMMII. We can make the direct link with "OE" which means "YOU" in the Hawaiian language. The prefix "OE" in the Ummite language is the pronoun "you" in Hawaiian, and we double the i: Hawaii. These similarities make us think that the Ummite language is built according to one of the rules comparable to the Hawaiian language.

In grammatical terms, hawaiian names have neither grammatical case nor grammatical genre. It is an analytical language. The phrases generally follow the verb-subject-object order. The declension of pronouns rests on eight cases and three nouns (singular, duel and plural). Genitive pronouns differentiate alien possession from alien possession. The pronouns also distinguish "us" exclusif and inclusif. The verbal function is marked by particles, whose position indicates the time, mode and aspect. The seven main verbal particles are:

- ua + verb (perfect aspect in the past) (but ua is often omitted),

- ua + verb + e (more-than-perfect),
- i + verb (past tense),
- e + verb + ana (aspect imperfectif),
- e + verb + nei (present tense, progressive aspect),
- e + verb (future or infinitive or imperative).
- may + verb (negation).

The Ummite grammar must have the same similarities to the Hawai language, they are analytical languages where phonemes are glued together to give meaning to sentences.

Now read this diatribe named **Warning to "invaders"** of the supporters of the hoax orchestrated by the group of Spanish esterists under the leadership of Pe a and Sesma. In the following you can read the arguments of the skeptical researchers who still consider that this is a Earth human manipulation.

Nowhere in the Letters is any connection between tetravalence and language mentioned. But should we trust the Letters as if they were THE reality? Certainly not, because: the expression "reflection of reality" is more adequate. It is not ceased in the Letters to align propositions at first sight contradictory. The slightest analysis allows in reality to make the necessary distinctions to make an ummite proposition finally true (and even incredibly coherent with its context). The "ummite reality" would have been to have them face to face and communicate with them. But this is not the case. Euclideans will say: "there is no Ummite reality". The language is thus the only "Bridge" between them and us. On the one hand, there is the earthly language, and on the other hand, theirs, much more "concentrated". There is also this sensation which is perceived when one evokes by the thought the ummite words. They have the curious power to generate a "world" that we ignore, however a strange faculty allows us to consider this language as real because it is coherent, that is to say that it is far from being an improbable invention (the work of a madman). How real? The ummites use "their" language, but they have several. Moreover, nothing means that "their" language is really used, "their" language may have been invented by them. What is real and what is not? It is written "For all of us what we are going to tell you is true". I read, (intransigent): "For US, it is therefore perhaps not the case!" Would there be different "degrees" of reading of the Ummite Letters? (to claim that No is to risk being covered with ridicule)

It is not a question of describing the philosophy, the politics, the evolution, or the activities of the Ummites, but in reality of "signifying" what these "realities" really are. It is rather difficult but I believe that it is by here that we find the exit. What are each of these disciplines (philosophy, politics, evolution, and activity\*)? They are disciplines, that is to say parts, or facets, of one and the same reality. \*AJH such is my proposal for the classification of letters ;-). What is this reality? It is impossible to "describe" otherwise than by turning around, that is to say by "surrounding" it. This is the KEY TO the tetravalent logic. The science, the acts, the thoughts, the approaches, the processes, the Logic, Everything: Is the component of a "Superlogic" (that we would call so only

the time to realize the real global implication of the simple Logic).

That is to say, that apart from two or three small lies Necessary for coherence, what the Letters say is TRUE, but not only at the primary level at which we could read it. It is well understood that it can be considered "distressing", sad to have to detach oneself from the emotional part that drives the energy of a scientific research. But what lies behind it is much more grandiose. It is the Reason of Things.

UUWUU IES: (tetravalent logic) = mechanical creating mechanical, (Analysis) cyclic.

\*\*

#### LANGUAGE AND CHARACTERISTICS

We use a double language (thanks to a sequential repetition of many words, we can express two express two simultaneous streams of ideas). The words noted in this document are approximate graphic expressions of their real phonemes.

For a long time, therefore, in our social relationships we have been expressing ourselves (albeit artificially) in spoken language. Gone are the days when parents had to communicate with their children by means of "codified" eye movements.

The language we use is radically different from yours. We can call it BI-LANGAGE. For example, when we emit phonemes such as OA DO IA KAAWAEA UMMO UMMO, we are expressing two streams of ideas simultaneously. OA: we made this trip DO: and we come from IA KAAWAEA: to study your culture UMMO: our planet.

But at the same time observe that we repeat each phoneme two, three, five, etc, times.

This constitutes at the same time a new code or language that is superimposed on the other verbal expression.

The interpretation of this language is of statistico-mathematical type (function of the number of repetitions of the phoneme) with which we express another thought at the same time. In the reported case we say approximately:

We have made this trip from Ummo to study your culture, and We don't think we are hurting anyone, so don't worry.

Another example:

DO UMMO DO DO UMMO UMMO DO DO DO

We come from Ummo, and We have arrived over France with our nave\*\*. If we had emitted thus with our voice:DO UMMO DO DO UMMO

We come from Oummo We must feed ourselves urgently.(These sentences would thus express series of coded numbers: 1.2.1.3 - 1.1.2.3. - 1.1.2.1. NDT)==READING

This passage shows an aspect of the ummite language that we have not yet considered. That is to say, where we would tend to translate a thing by a word (I remember the 'little game' to which I answered brazenly with "my rules" (which, added to the ones used, explain the low correspondence - score = 14%), a numerical system of repetition is proposed to us, which we do not grasp. This type of information is suitable to make the ummite language understood as "more deeply true".

This proposal, which must be accepted as true. If one does not believe in the ummite reality, the appearance of the language is deep enough to intrigue directly. In fact, we have a total of 3 complete sentences in all the texts, each time I believe with their correspondence of "literal" and "numerical" meaning. I also note: "we come to feed urgently" is nothing but Humor! The only one of all the ummite jokes! Mastered in such a way, if the bilanguage multiplies by 10 the credibility of the ummite language, the simple use of humor multiplies it by 1000!

\* There is a great difficulty in translating the expressions of our cultural language, because its constellation of meanings is very different from the complexity of earthly equivalents.

... Do you realize that the means you rely on to transmit these mental patterns, these ideas, that is, THE INFORMATIVE COMMUNICATION LINK: LANGUAGE, is frighteningly poor? ...

YOU USE A STANDARDIZED LANGUAGE. The same oral forms for all, as if the receiving minds were all the same. ...

You despise psychology to the point of not striving to create a language that makes the understanding of ideas more the understanding of ideas by adapting them to the intellectual level of each person.

...

It is perhaps utopian to think that these forms of language will come about among yourselves, by a simple meeting of the leaders of UNESCO, for example. You would also need many years of analysis and a long period of elaboration, followed by many others for its adaptation. ...

You have not found the means of communication, the appropriate language, the adequate technique of information allowing men to understand each other thus achieving the maximum output of the social network.

==READING Here it is well question of "to prevent":

- Comparison between ummite language and terrestrial language by an interesting way:

Constellation of meanings (LU)  $\neq$  Complexity of equivalents (LT)

- Many years of study to achieve this

- Our NEED to adopt such a language.

\*

You have understood very well that our only approach is the Formal Logic that we call AADOAUGOO, not because we underestimate the possibility of the existence of other logical languages, but because this one is the only one that has allowed us a coherent development and an objective "capture" of the Scientific Truth insofar as the time and our Planetary framework has made it possible.

==READING AADOAUGOO = Symbiosis that forms the context (translation that I propose for (AA)symbiosis+(D)form+(O)object+(AU)possible+(G)organizes+(OO)in its frame).\*\*

The earth child did not seem very surprised by the language of our brothers.

==READING Small but important, this proposal is the only one that states that the ummite language is spoken by ummites!

BUT: do they speak Ummite as we know it? Are they using their fake "throat surgery" voice to communicate? Wouldn't the repetition of words have put the flea in the ear of the child? How can a 9 year old child not be surprised by stutterers with throat surgery? I want to but there are some strange things.

\* So when we say that in the BAAYIODUU, the atoms of Krypton rotate in pairs in elliptical orbits or when we refer to electronic "jumps" within an energy level or atomic sub-layer, we are using symbolic language.

==READING

Very interesting!

That is to say: what we can hardly see - deduce (electrons) is in reality a "view of the mind" perfectly Symbolic of Reality! The very use of the electron turning around a nucleus IS a language BECAUSE it is Symbolic of the reality. The only relation between the reality and the electron in orbit, is of the order of the simple Evocation.\*\*

If we use the terrestrial scientific language, we distort and falsify the truth because, as we have indicated above, such terrestrial hypotheses are originally flawed and if we resort to the logical path of explaining to you beforehand your errors or inaccurate ideas that you have formed, it would require a large quantity of typewritten pages.

==READING



Here the path of logic followed by the ummites is a "dismantling" of our concepts, in order to isolate "bricks" and then reassemble them. The proposition "IF..." is conditional, but in reality it is perfectly valid if we change the subject "your mistakes" by "our science" (referring to the quantity of typed pages that had to be EFFECTIVELY written). The phenomenon of "saying what has been said" is more than just circumstantial. This proposition is valid without its subject. It "reflects" the logic of what "makes people say what was said".

\*

UUWUUA IES (TETRAVALENT MATHEMATICAL LOGIC) according to which any proposition will indiscriminately adopt four values:

- OAIOOYAA = (TRUTH)
- OAIOOYEEDOO = (FALSE)
- OAIOOYA AMMIE = (can be translated: TRUTH OUT OF WAAM)
- AIOOYAU = (untranslatable in earth language).

Obviously there is a serious obstacle because we speak different mathematical languages. Languages which by definition (as we have noted in a previous document) are conditioned by a set of psychological conceptions different between you and us.

==READING

The "psychological conception" is of great importance for the understanding of language, things, the world. In the first reading, it would be about objects that don't have the same shape, or vague habits that we find hard to imagine (and even perfectly useless). In the second reading, I read that it is politely ignored that our mathematics was never conceived to be a language... !

\*

UMMO's XANMOO absorbs directly the data of the problem and its writing of the statement (it must be always very well formulated) in standard UMMO language and provides the results in typographical or phonetic characters.

== READING

The "Ummo language", to say the least, is used for the interfacing with the computer.

This one, I imagine, undertakes all the constellation of meanings that is consequent to each of the propositions. Such a computer, to the question "Can I use an umbrella in sunny weather?" would answer "Yes, as an umbrella". There is also mention of "standard language". Is this the version without the repetitions that constitute bilanguage?

\*

But transcribing these ideas becomes really difficult if you take into account the fact that

But transcribing these ideas becomes really difficult if you take into account the fact that your mental patterns are conformed in another way than ours.

our own. We cannot use a common language that is intelligible to both sides.

Right now, as I try to use verbal idioms in Spanish that are familiar to you, I am not saying anything. familiar to you, I am suppressing the flow of ideas that I could express with ease if the meanings of your phonemes could correctly interpret my thought. Could your brothers Rilke, Neruda, Garcia Llorca, have expressed their exquisite sensitivity with the only verbal instrument of a vocabulary extracted from the index of a electronics manual?

As far as we are concerned, it is not a question of looking for a phoneme or a word

Spanish word whose meaning is similar to that of our corresponding word. Even if this first case were obtained, and even with the realization of a lexicographic analysis of the language, the complex expressions integrated by these "words" would hide unusual meanings for the topical habits of the terrestrial thought. earthly thought. For this reason, the ideas that have been proposed in these

reports to other brothers of different nationalities are necessarily "geotrophic", that is to say with a pronounced flavor of terrestrial cultural orientation; but this is due to the chosen means of due to the chosen means of social communication. The evocative power of the phonemes that are familiar to you blocks any serious intention of cultural transfer exo-geo-gnostic cultural transfer. The idea of offering you these conceptions to serve as a doctrinal basis to replace the pillars of the pillars of current earthly thought is far from our mind.

==READING

Here it is! It is indeed a question of "Describing" things, and not (in isolation) of demonstrating, explaining, or comparing them.\*\*d77

Our first objective of our thought was to elaborate dialectical bases, a logic which was independent of language, of the language. This was of vital importance if you take into account that our form of expression is bisynchrovalent and that the verbal coding of the thought in two modes of expression capable of being phonetically simultaneous (one by a "linguoguttural" mechanism similar to the languages of the Earth, and the other by a code that implies sequential repetitions of phonemes) predisposes to erroneous interpretations, being a source of deceptions due to the ambiguity of the terms used and to the emotional component during their expression. For this reason, our OIYOYOIDAA (a way of expressing ideas by coded repetition of different words in the context of a normal conversation) was chosen as a basis for verbal communication of our AADOO-AUGOOA (logical) concepts. Thus transcendental ideas are expressed in a mathematical language.

==READING

Weird.

The adoption of the ummite language, framed in their History, was a sudden Decision. It is therefore useless to look for "roots" or possible coincidences between words.

"dialectical basis = logic independent of Language"!!!

In summary, consecutively, what is said :

- historical elaboration of the bisynchrovalent language (words + repetition, = 2 simultaneous discourses)
- elaboration of the OIYOYOIDAA (way of expressing ideas by a coded repetition of different words in the context of a normal conversation).

This is confusing. My reading (if there had been for example a translation problem) would be the following:

- historical elaboration of the simple ummite language
- observation of the confusions, creation of the Logic of Language
- Adoption of a complementary mode of numerical type, allowing for example to communicate mathematical concepts. (It was perhaps finally this last one, called stasticomathematical, which was also called "standardized language" serving to address the Xanmo...? In the next paragraph the name "topical language" also appears) That is, after its discovery, the Logic of Language was applied in a numerical way to the previously existing language. If we believe this passage, any comparison between tetravalent logic and ummite language is impossible, since logic would be consecutive to language, and its application would be only the repetitiveness of certain words. Does everything fall apart? NO, because this text is ILLOGICAL! One cannot create a bisynchrovalent language, be a victim of its confusions, and then create a logic to make the language bisynchrovalent! (it is however what is written). For me the language of UMMO presented in the letters is their functional and technical language, the one that has been invented from scratch, either for themselves or for the sole purpose of testing poor sick people like us. Nothing can certify one or the other proposition, it

is not useful to do so, all we want to know is the NATURE of this language.

\*

NOTE 4: Let's illustrate with a real example this modality of verbal communication of information. For this type of language we don't use "vocables or words": the propositions are encoded by combining the components of the sentence (subject, predicate and verb as you would say) in the form of a coded proposition. The euphony is less important than the real meaning of the thought. Thus the proposition "this greenish planet seems to float in space", would be expressed in our topical language (DU OI OIYOO) in the following way: AYIIO NOOXOEOOYAA DOEE USGIGIHAM; But if we wish to express through the OIYOYOIDAA, we will only need three coding symbols:

Proposal: this planet is floating in space. Corrections: Greenish, appears, we believe that.

Three digits (in duodecimal system) are used, the proposal requires seven digits and the corrections five and four digits respectively. In this way, in an "intranscendent" chatter like "UAEXO OE IANNO IAUAMII IE OEMMI + UAMII XOA AALOA" would be interposed the previous information: "AEXO OE IANNO IANNO IAVAMII IE IE UAMII XOA AALOA AALOA", in which the digits can be expressed in two ways: repeating some phonemes and modulating or emphasizing some of these words with a characteristic form. It is this last modality that serves as a basis for a third type of language that, taking advantage of the fundamental codification of very elaborate propositions (numerical coding), establishes flexible rules flexible rules in the communication of much more complex and exact information. Thus when we have to dialogue or express transcendental ideas of a logical, mathematical, metaphysical or physical character, we use a particular codification of propositions, formulated in such a way that our dialectic does not encounter idiomatic, phonetic or affective obstacles. The significant gain in informational power compensates for the slowness or viscosity (poor fluidity) of the verbal communication flow.

==READING

Here is the last chance to test an ummite sentence! GRR nothing allows us to do so. That said, let's be positive: if we discover enough about the "ummite" language (=explicit technique!), it will mean that we will have grasped the tetravalence, as long as there is a real link between them (this will remain a supposition for a long time to come, that said, light attracts flies.) Thus, a light would appear that some people, who read these lines with a depressed look because their equations on tetravalence were sterile, and who do not believe a bit in the way I am experimenting, could perhaps see a spark. Did you say Mathematics? Oooh, with an S too! Well, let's be clear: 1 : language; 2 logic; 3 psychological reconditioning; 4 tetravalent mathematics. \*How can we explain our metaphysical foundations to you if our respective languages are based on contradictory logical principles? The problem cannot be solved by a simple transcription of the meanings of phonemes as you can imagine. .... In this sense, the orientation of neopositivist thinkers of the Earth like Russel is clear-sighted, not by the rejection of all metaphysics but as a demand of a revision of the language. As long as your forms of informative communication are not clarified, the process of finding truth will be slow and very laborious. ... The "things", the objects of my mental process are probably not as I perceive them, nor as I process them by means of a more complex rationalizing mechanism. Causal relations are relations "IN ME" processed according to an order elaborated by such mechanisms. A plant is apprehended by me with characteristics that symbolize its actual attributes. My sensory impression arriving at the level of the consciousness is undoubtedly an illusion due to external constants. Thus color will be the psychological impression of a stimulation of an electromagnetic nature, and the concept of mass imprinted in my consciousness is very far from being able to identify with the real physical attribute that generates it. ... whenever I perceive such an aroma, can I be sure that it is an attribute of camphor alone? And not that it may be

an illusion or hallucination? ... (o-o) when a physicist on your planet claims to be observing a micrometallographic test tube to see its optical properties, he produces an alteration in the process by using light for observation. This is an insurmountable obstacle since the observation itself alters the true nature of what is observed. Something similar happens with the BEING. IS IS when it IS NOT THOUGHT AND ITS IDEA DOES NOT EXIST IN MY CONSCIENCE. (.flashback...)

Even if I didn't know how the WAAM really "is": is it "here", dynamic or static, changing or rigid, generating ideas that are reflected in my consciousness without my EGO being able to change its essence, its own being? Our answer is NO. We can never reach the truth, the essence of WAAM, not because of the WAAM, not because such a WAAM does not exist nor because there is a barrier that prevents us from doing so, but because BY THINKING ABOUT THE BEING WE CHANGE ITS ESSENCE We OEMII create the WAAM by thinking about it, the Cosmos appears to us with a configuration of IBOZOOUU (see further the physical concept of the WAAM). Undoubtedly these IBOZOO-UU exist as a speculative reflection of SOMETHING THAT WAS NOT IBOZOO before we thought and, as THINKING IS BEING, before we, the OEMII, existed. It is a kind of "symbiosis" between the external reality and us. The external reality bends to our mental process, it is modified as soon as we focus our consciousness on it. We then elaborate a binary WAAM model composed of physical factors IBOZOO-UU which is our creation and at the same time this reality conforms our ME, creates it, generates it.

It is not only the fact that the image of this WAAM is distinct by the intervention of mental processes of different configuration from ours. It is that the very BEING, the very ESSENCE of the WAAM will be disturbed. This relativity of BEING, this versatility of BEING, is reflected in our logic by what we call AAIODI AYUU (range or network of forms of BEING). Let us suppose that we symbolically order all the ontological possibilities (for that let us disregard the principle of the excluded third Aristotelian) of a SOMETHING transcending my "I". It is a set or series of non-tautological possibilities that we can code even more synthetically as follows: S1; S2; S3; S4; S5.....; Sn We arrive at the meaning of the AIOOYA whose transcription in earth language is impossible. AIOODI is "CE" which is susceptible to adopt infinite possibilities of "existence" (S1; S2, S3; ... .. ..; Sn). So, for example an IBOAYA OR (energetic quantum, photon) can be S1(BE) or S2 (NOT BE, in case it turns into mass), but both possibilities are deformations of an AIOOYA caused by my I (thinking being).

==READING AIOODI is "that" which is "thought", "curved". AIOOYA is the "form" taken by AIOODI for the whole ontological perceptions of the Cosmos. It is "what" the whole of the "thinking I" "thinks" about. This "curvature" is caused by the very action of "thinking". However the possibilities are deformations of an AIOOYA: contradiction? at least seems true the proposition: "an AIOOYA provoked by my I", because there is an infinity of AIOOYA, and only one AIOODI. I risk a simple comparison: when discovering an apple for the first time, the reality of the apple, from a strictly psychological point of view, is absolutely uncertain. At first sight the object is round, so the apple is round. If the experiment stops here, the observer will describe an apple as a ball, with a slight doubt about the color. The more the inspection progresses, the more vocabulary words will be needed, the more it will be possible to "identify" the apple until a precise idea is obtained. No matter how far we have progressed, however cretinous the conclusions we sometimes draw, it is true for us how little we know. But finally, once admitted a dictionary, it will be possible to affirm with certainty what the "apple" is, by "surrounding" it with words which, in fact, also contain important information to know about the apple. If for example we could not use this word, how could we say it? (this I believe is a successful TV game and it is never for nothing this kind of thing) apple == fruit (so edible), informal roundness, scarlet color .... GOOD: it will not be easy... But it looks a

bit like our ummite translations, right? Especially since we have to consider why we change the essence of the Waam by thinking about it!

What does this have to do with anything? Language IS what describes Reality, so it is a mirror that must be well polished, and very very well positioned

Note also the expression "the answer is No!" to a question that is the opposite of the proposition, a "small" example of the apparent contradictions sometimes evoked. I tell you, I am like Mulder in X-Files that nobody can believe, but: "everything is psychological".

We, OEMII, see the WAAM and its factors integrated in the possibilities S1; S2; .....; Sk. You, the men of the EARTH, accept for the moment only the possibilities S1 and S2.

But other hypothetical thinking beings will pick up AIODI under the possibilities different from ours Sk + 1, Sk + 2 ..... Sn. The drama of the OEMII or of another EESEEOEMI resides in the fact that his search for the truth, his search for the AIOODI, will be fruitless since this one will always present itself under the characteristics S1, S2, S3 ... .. Sn.

==READING Att are you kidding or what? I thought that AIOODI was reflected in various AIOOYA Here, there are different AIODI which are like AIOOYA... ???

I believe, (personally) AIOOYA: Frame intelligence / (YA) active set and: AIOODI: (AI) intelligence of (OO) frame / (D) formed (I) of beings, and therefore that : AIOOYA is "that" which is transformed into AIOODI by the very fact of "thinking". "What" we think about, is precisely AIOODI, while AIOOYA remains imperceptible. AIODI : intelligence of object formed by beings (my translations are all personal)\*\*\*comments: In reality, even if we have to lose sight of all rationalism "for a moment" in order to rely on a "linguistic logic", which is supposed to supplant mathematics for the domains that are inaccessible to it, this should not make us back down. Indeed, "I believe" that there is "a" tetravalent mathematics. In fact, there could be several. The process is clearly to acquire new information little by little, and constantly to consider it "as a whole" in order to reinject a new "axis" of understanding into the Understanding itself. As time goes by, the accumulation of information becomes more and more influential on the "global meaning". Each time a proposition is made illogical, it drags with it a whole part of the construction. This is very disturbing. This effect is more and more violent as one goes along.

Also, there is an increase in the ability to see, to understand, that is to say an increase in the power of analysis. And this only thanks to Time. This increase is exponential, because the quantity of elements "coupled" and "to be coupled" is increasing, itself exponentially. (and so on going towards smaller and smaller considerations of objects). In this research framework (the one in which I would like some help), we are more and more far from the "ummo" consideration, but more and more close to the "science" consideration (o-o) That is to say that we can understand by this event: Exactly the same thing that is described by the emergence of the BB by WOA (and so on): an entity is born (for us a Logic of the logic). In this last one, is contained in a fixed way for ever a Law, simple and condensed, resulting from the Ummite Letters, which are like "an accoucheur of ideas". For my part it is the following: 000 (A00, 0A0, 00A) == AAA or : Binder (essence, object, idea) == real the sign == (from Flash) means "equivocal" in the sense of a real transfer of information between one and the other. This minimal transfer of information is exactly "a very small thing" which implies the existence and reality of "all things". In order to understand what undoubtedly appears to be "bullshit" (as is the first perception of the Ummite Letters), one must do no more and no less than : To show good will !!!that is to say, to make tests. It is a question (for training) of qualifying with the terms of the theory, words (thus circumscribed in a logical concept - that is to say relational-direct - there are different levels of logic; this one is primary, arbitrary

and chosen—). Any proposition is accessible in this way. The present work is motivated by the desire to make it understood. example :(gluttony [thinking of Envy], cake [chemistry of the cook], idea of cake -[understand: the primitive idea of making a cake]) Eating [that which links these 3 realities into One by an arbitrarily chosen means] == Reality of the cake [that which exists so that the cake exists]. From the simple word "Eat", framed in 3 axes of tetravalence, I could deduce by the mind that it exists: (need, food, superfu). Although not very convincing, this analysis brings however an important information: "Superflu".

I can re-think my demonstration: (food, sweet baked dough, superfluous) == Gateau (as we envision it). In this way it is necessary to analyze all the words of a proposal. Little by little, CERTITUDES are built, that is to say links of the tetravalence that we will consider with the time more and more solid. This is how the tetravalent logic is FOUNDED. It cannot be learned, it is understood as we go along. Very quickly, there is a large quantity of things to analyze. I call "endogenous" analysis the deduction made from the word "eat", which here is the Binder. Any proposition MUST be considered in these three simultaneous ASPECTS described by the tetravalence. I call "exogenous" analysis the "understanding" of a reality from the 3 axes of the tetravalence. It consists in selecting 3 EVENTUAL aspects of a same "apparent" reality, then "imagining" what could LINK them. As soon as this "Link" is found (it is the hardest to find, as Sherlock Holmes would say), "everyone" appears by projection, making the initial proposition true. As it is obvious in tetravalence, any proposition is automatically True, by the very fact that it is proposed. So how can we understand AIOOYAL? We have seen AIOOYA, bent into AIOODI by our thought.

AIOOYA + U (the Binder) is itself what serves as the Binder in the tetravalence.

It is described as Out of all Waam. Indeed it is so, since it is an arbitrary proposition decided by thought, i.e. literally an "imagined reality".

One can understand the reluctance to translate this by simple words, in order not to induce bad tracks, by making believe for example in a new "being" external to ourselves. (there are already enough of them). d: THERE IS A REASON!

Analysis 2

would require a collective opinion In order to proceed to the analyses which require the exact definition of certain words, it appears necessary to study beforehand and in depth the ummite language. Before even beginning, it is advisable to question the presence of this language in these texts. At first sight there are two possibilities:

- it is their language, the one they speak, which was orally transmitted as an indication in the letters. In this case, the variation in spelling can be explained by a lack of interest in this at the time of transcription (we know that this was not the case because great care was taken in proofreading, and probably these variations had the effect of making us believe that this was the case). In this case also, one can wonder about the interest of "denouncing" their identity, by "announcing" their language, which would unmask them very quickly to other civilizations...(ufological discussions) Finally, it is not functional to transmit a language for the sole purpose of curiosity, or to allow us to communicate with them; it is perfectly useless.

- It is an informative content that is part of "what the ummite letters mean".

The letters are presented as a royalty, a logic that we have not grasped structures both the writing, the subjects addressed, the philosophy, the cosmology and a vast understanding of the world.\* In this context, why not imagine that the "ummite language" was created from scratch, in order to allow, once other certainties were deduced, to bring an intriguing complement of information.

It is obscure but in fact, in the end, we will need to obtain the exact definition of the words.

For my part, imagining perfectly the power of a XANMOO, I consider as highly probable that a language was built, according to signs existing on earth.

Indeed, how to argue that the ummites use "only" 5 vowels, that is to say 5 vocalizations ?Especially, without voice !Moreover, I argue that the notion of "game" has been sufficiently supported in the letters to deposit in the minds the principle of the "game of tracks". This assumption is not hazardous, it is based on the principle that, in letters, everything has an importance, everything is utilitarian, everything is functional.\*Thus freed, let us not be afraid to make proposals of combinations, tricks, associations in order to decipher more the information contained in these words. Jean Pollion's work initiated the principle that there was "something to look for". The solutions found are very close to the "color" of the Ummite philosophy, and until proven otherwise, it is to this intense work that has already been done that we must rely. Indeed, to certify "as a whole" an understanding of the translation requires a long time of cross-experimentation on the 1300 words listed. But before reaching 1300 words and a whole dictionary, it is better to pick some of the most used words, the most important ones, and to work with them. The whole should represent all the letters. Here I base myself on local information. Then you have to start on a logical basis. From there :

- there is a logic of linguistic discovery, it is the work done by JP with a premium for originality. -
- there is the logic that I deduced from all the work done before me (the one I think I understand and which is tetravalent)
- without logic, we only have our instinct, our common sense.
- Any new logic or research strategy is welcome.

One more justification: What need is there to tackle this heavy chapter when this work has already been done? My personal opinion is that I am not satisfied with the current translations, which I find too rigid.

The mental effort to encompass the features that define a word, I believe, should be less.

That is to say that a person who has no knowledge of the ummo affair, discovering this, will see how passionate people are blinded by their passion. In fact, he should be blinded by the limpidity of the demonstration. (research axis) So even before starting we are aware of the heaviness of the subject and the difficulty that there will be to validate a deduction. It is very important to always distinguish 3 aspects of "what is" (tetravalence). We can do it with our language in a fluid way.

- what constitutes (real, symbiosis, exchange)
- what does (action, balance, change)
- what explains (active, equality, change)

or better :

- common noun
- present participle
- adjective, adverb

Indeed, the same word can become a cause, an unfolding or an explanation, depending the context. Forcing yourself to find the 3 realities of each phoneme translation is a good start.

In this way, it will be possible to adapt the grammar of the word by relying on the consecutive order of the symbols. Moreover, this "softens" the meaning given to the letters in the words (as it has been pointed out to me) in the same way that words change definition according to meaning in the sentence.

Here, however, it is not the meaning in the word that gives the letter its meaning (one of the three aspects), but the consecutive order in which they arrive, which is less "relative" than our grammar and therefore more informative.

Then, again tetravalence-a-dav but at the level of vowel meaning, where a rule of meaning also applies: we can see the relative role of vowels:

A= causality (immaterial)

E= essential

entity, emotional, logical : consciousness (immaterial)

I= real, material,

neguentropic entity : evolving (material)

O= defining entity : unity, object (both)

U= binding entity (both)

ATT: I call "entity" any discernible reality of the type described in the table. But O (defining entity), will then simply be reduced to "entity" because we don't care what it defines, as long as we name it. Or, as you prefer, we choose to say "definition" to name something that defines another. But I prefer to stick to "entity", keeping in mind that it is just a name. I come back to "evolving" (I), of course (JP): evolution = "T", but "evolving" has nothing to do with evolution except that it follows its path. One would also say "living", "neguentropic".

By "evolving" we must understand any object whose ibozoo uu are existing like the scrolling light of a billboard with bulbs). this object (apparently fixed) "changes constantly".

Concerning E: consciousness and logic may seem far apart but: No.

the addition reveals a later Dimension:

AA= mutual causality => symbiosis

EE= conscious entity => conscious of itself

II= evolving entity => evolving in a social network

OO= defining entity => within its defining framework

UU= linking entity => functional network (system, mechanics)

to understand "further dimension" (or higher) is typically in this example: a domino is an entity. Symbiosed (multiplied and the whole working harmoniously), this "whole" forms animated images (for example). This animation, unpredictable at the mere sight of a single domino, is what I call "later dimension". Similarly, symbiosis of a line gives a surface, which is like squaring its parts.

More interesting are the combinations :

AE, AI, AO, AU

EA, EI, EO, EU

IA, IE, IO, IU

OA, OE, OI, OU

UA, UE, UI, UO

...which give :

causality : AE emotional causality, AI evolving causality, AO defining causality, AU binding causality

logic : EA acting logic, EI evolving logic, EO defining logic, EU binding logic

evolution : IA evolving acting, IE evolving conscious, IO evolving defining, IU evolving linking

definition : OA acting entity, OE logical entity, OI evolving entity, OU binding entity

Link: UA acting link, UE logical link, IU evolving link, UO defining link

Examples:

WOA : creates an acting entity

OEMII : networked conscious entity UAA (law) : actively acting link

EESEOEMII : conscious entity perception cycle defining a consciousness, correlated in social network



But to do it well, we can reduce to one word each probable association, by picking more judiciously than I do among the various variants to get closer to the "psychic meaning". in black actual def. (in blue conceivable modification)

- (A) truth, action, effectivity - real, action, active, (cause, provokes)
- (AA) effective balance, equality, symmetry - symbiosis, balance, equality
- (B) contributions - exchange, change, modification
- (D) manifestation, form - form, constitutes, formation
- (E) mental image, perception, sensation - perception, consciousness, logic
- (EE) self-aware (GOO) balanced or stable organization of constituents. included in its framework
- (G) organization
- (I) (never equal to itself), evolving, living neguentropic, individual (II) living in a network
- (L) equivalent, corresponding - puts in correspondence (M) juxtaposition, meeting, association - correlation, coherence, reunion
- (MM) assembled, organized
- (N) flow, transfer - extent, length, duration
- (NN) dimension, frame
- (O) entity, being, existence, creature, dimensional reality, atom - unity, defined entity, definition
- (OO) symmetry, equality, balance, equity, reciprocity . - Entity defined in its framework of reality
- (OA) make real
- (S) round, turn, cycle - to exist: insofar as a "cycle" took place normally proving the functionalism (one could say the S of the heart = beating)
- (T) evolution (ideogramic association of evolvers) II=2 bars, T=2 associated bars
- (U) dependence - element (which can unite with another object)
- (UU) interdependence - system, mechanical, logical
- (UA) mandatory, necessary - rules, meaning, order (non-deterministic)
- (UAA) deterministic law
- (W) variations, changes, events, novelty, information - creation, invention
- (X) functionality = SS1
- (Y) set
- (Z) functional = SS2

which gives :

BUAWE BIAEI : B modifies U element A of action W creates E consciousness B modifies I evolving A causes E consciousness I living being (soul)BUUTZ : B modifies UU mecanic T (in) evolution Z functional (motor)

EDUU : E

consciousness D (of) form UU mechanical (synapse: sensor)

ENMOO : E perception N length M correlated OO in its frame of reality (unit of measurement)

GOODAA : G organization OO defined in its reality D balanced form AA (state of matter)

IDIA : I evolving D form I living A real (animal, form of life) I believe IDI: D intercalated between II the attenuates

XANMOO ISOO AYUBAA : X functionalism A real N extended M assembles OO in its frame / I living being S exists OO in its reality / A actuates Y set U element B modifies AA equilibrium (networked computer that manages social equilibrium)

OEMII : OE conscious entity M united II evolving in network (human)

OEMMI : OE

conscious entity MM organized I evolving alone (member of a society)

UAMII : UA rule M assembled II thinking being (food)

UMMOAELEWEE : U element MM organized O unit / A action E perceives L matches E perception  
W creates EE reality (government)

WOA : W creates O entity A that acts (God)

...and for fun :

XAABIUANNAA : X...(place?) symbiotic modifying individuals rules framework equilibrium  
(enclosure that constitutes the real habitation)

USAGIISOO existing binding entity active organized real network in its framework of reality (state  
"isodynamic" of the cosmic space)

IBOZOO UU evolving modified functional entity in its reality, functionally (=in relation with its  
environment) (elementary particle)

OYAA entity symbiotic whole (cold star) GAA organized equality (square)

OAWOOLEAIDAA makes real change in its frame, makes the surrounding real perception correspond  
in a balanced way (inversion of the particles of oowea)

UULUEWAA mechanics that match perception creating equality (device that allows to capture  
sounds and take pictures)

OUMBOOBUUA elemental entity gathered modifies their framework modifies the effective rules  
(Goods - intellectual services) WAAM creates coherent balance (universe)

BUAWA modifies element [of] action creates [an] action finally presents itself :

- AIOOYAA = (TRUTH) evolving causality considered in its framework, symbiotic whole

- AIOOYEEDOO = (FALSE) evolving causality considered in its frame, real set that takes shape  
[itself] in its frame (=only real in its frame)

- AIOOYA AMMIE [L] = (can be translated: TRUE OUTSIDE WAAM) evolving causality  
considered in its frame, active whole acting in an organized way in conscious beings (ideas)

- AIOOYAU = (untranslatable in earth language). evolving causality considered in its framework,  
binding set (of) elements (binding causality)(a small comment on the "untranslatable": for such  
essential definitions, one can only observe the "retention" of information on this transcendent  
passage).

I would have preferred to read the last word "out of its frame"... sniff.

Finally I point out the joy of being able to rely on the work already done in order to fall back on  
one's feet in case of hard knocks in the logic; but globally, besides the mistakes that my inattention  
will have let pass, I hope to bring a new axis to "grasp" the deep meaning of words.

d:AIO OEMI BIEWIGAE ABUGU

«We're looking for this Ummite This E.T. is not yet recovered Watch out! According to information  
"controlled by scientists", aliens have infiltrated the Earth for several decades. They'd be like us  
and hard to spot Beware, good people! Your grocer, your mailman, your neighbour may be....

Invaders among us? Like on TV? Real ones?

Yes, real... for those who believe...Since 1950, aliens have been living among us! They have landed  
in France, near La Javie (Alpes de haute Provence). These are the "ummites", so named because  
they claim to come from the planet Ummo, which would orbit the star Wolf 424, a star of our  
local group. The "ummites" would study our civilization and make contact by letter or telephone  
with the humans most receptive to their ideas (finally... the most naive) They would have set up a  
base in Spain, but would have relays around the world, from which they sometimes send letters,  
"postmark authentic". These letters have very diverse subjects, are written in the language of the  
recipients, usually in Spanish, and are enamelled with words "ummites" to make it more true. At  
the analysis they contain true and false (and all the more false as we push the analysis further)

No one has ever seen the "ummites". In fact, we only have their messages. The Ummo affair is therefore only a matter of "contact", as it has existed for a long time. The "contactees" are people who claim to have been in contact with aliens. Telepathic, or direct, even physical contact (aaahh..., love with a Venusian!). In general they have received from their initiators a philosophical teaching, and warning messages, warning humanity against the nuclear holocaust.

Adamski Reverb

Adamski Gas Street Lamp

the Martian with suspenders

Nevertheless, if we admit that aliens, far ahead of us as they should be, are making such a long journey to come and teach humanity in a totally disinterested way, then we must also admit their bizarre absence of judgment: They've only ever introduced charlatans or enlightened people.

It must also be said that their machines were too well camouflaged as household utensils or other hardware, saucers, or hubcaps. An extraterrestrial initiator coming out of a street lamp is about as credible as a bishop coming out of a vegetable mill.

And when you let yourself be photographed by a terrien, you have no idea to wear suspenders! In short, neither science nor governments have ever paid them the slightest attention. The guts!

So we had to find something else.

First, it was not necessary to repeat the error of Adamski, who had located the origin of its initiators, under the thick clouds of Venus. He had not guessed that V2, we would spend in a decade interplanetary rockets, and that on December 14, 1962, Mariner 2 would reveal that the temperature of Venus was above 400°C. Hard, hard. He died three years later.

Detection of a large planet

So we had to bring the E.T. from a planet where the Earthlings are not likely to stick their noses. Precisely, the idea of extra-solar planets was beginning to take shape. Astronomers were working to detect such planets by the disturbances they create in the proper motion of their star. In 1958, Aimé Michel recalled in "Science & Life", that according to the work of Holmberg, a large planet orbited alpha of the centaur. Since a planet such as Earth could not be detected by this method, it was safe to deny that it was based around a nearby star. But the journeys became very long and the contactees could not wait 30 years for the answer to a question asked. Solution: to settle permanently on Earth. And then, what's the point of grandiose productions when it was so simple to write to the contactees by mail.

The Baal Contract

On March 16, 1964, the writer Robert Charroux received a strange missive: Sir,

What I am writing is not a wonderful tale, nor is it a science fiction story...

Vaïdorge

vaïdorge bâaviennne

Thus, in 1964, he revealed in "The Book of Betrayed Secrets" that he had received mysterious documents from a certain M. N. Y., solicited by beings from the planet Basavi. This planet, 1.5 times larger than the Earth, would turn in 311 days of 27 h 12 mn 57.6 s around Proxima of the Centaur, alias Basel.

Mr. N. Y. or Emen Ys had extensive documentation. It described the Basel civilization, its language, its metric system, the technique of their flying saucers (vaïdorges) and various concepts of physics, chemistry, astronomy, etc. The Basel people had a secret base on Earth and many correspondents in different countries. They were watching us and seemed very concerned about our nuclear arms race.

The vaïdorges had a central cabin, without seat or berth, and a toric structure. They didn't

really have a thruster, but they used antigravitation and tipping into a negative time universe. Experienced engineers would have discovered brilliant ideas, but also obvious impossibilities. The entire Basel civilization was concentrated in a metropolis. The family unit no longer existed there and the children were raised there according to a method reminiscent of "The best of worlds" by A. Huxley. Here we are! Bâavi is too much like the utopian cities that abound in the Earth's imagination. They are characterized by the uniqueness of concepts. One principle of government, one state, one people, ein Volk, ein Reich, ein Führer... Whoever designed this utopian planet has its place in the gallery of eccentrics and other literary fools, capable of spending their lives recreating the description of another world. The initiation to the mysteries of Basavi, finally produced a small sect: the Baal-Contract The "ummites" come into play.

The Ummo case is in the same vein. According to two subsequent letters, scientists have received letters of presentation sent by the "ummites" since 1955. (scientists that have not been found, but this is a constant in this file). (letter NR6 and letter D21 where they explain the motives for sending mail while explaining that they use the numbering system in base 12 and some ummite mathematical symbols). They don't seem to have been taken seriously. Lady! Tell a scientist that you're an alien vacationer on Earth, and that UMMO, your planet is 3.68 light years from Earth, he will give it the same interest as if you claimed to have found the philosopher's stone or performed perpetual motion. Put in immediate trash.

It was therefore necessary to find correspondents more "open" (hear, more naive). In fact, in 1965, there was more and more talk in Madrid of a certain professor Fernando Sesma Manzano, president of the «friends of visitors to space» society. Better, he had just published "I, the confidant of space men" (2). There he recounted his telepathic or telephone conversations with the "aliens", without seeming to have the slightest doubt. This is the right man. He wouldn't throw the letters in the basket! On January 16, 1966 Fernando Sesma Manzano received a strange missive Sir, We are aware of the importance of what we are about to tell you. We are sure that an assertion of this nature is usually only made by a joker... Ummo, the book of Sesma

Not very similar to ummite. Thus, in 1967, he revealed in "Ummo another inhabited planet" (3), that he had received mysterious letters written by beings from the planet Ummo. This planet, 1.5 times larger than the Earth, would turn in 180 days of 30 hours 55 minutes around Wolf 424, aka lumma. Sesma had a lot of documentation; it described the ummite civilization, its language, its metric system, etc., etc.

(See above, replacing vaïdorge by oawoolea uewa, and antigravitation by iduwii ayii).

Unlike the Basavians, the "ummites" were not nearly immortal and did not claim to have colonized the Earth 10,000 years ago. Nevertheless, there is a profound similarity (in both cases the authors place their planet around the nearest star they know), and a slight anteriority of the legend of Basel, on that of the ummites. It is therefore quite possible that the inventor of the ummites did not invent anything at all and did only copy recent and little known data (it is still a constant in this file).

According to the "ummites", if they had chosen to contact the eminent professor Sesma, it was because he had proved in his publications that he was really expert in cosmic civilizations. (and he had not forgotten the "s" of "cosmic").

Only now, the eminent professor was so well known overseas that there was traffic jam on his line. And as he did not discriminate, the "ummites" were distressed to see him mixing their precious teaching with spiritualist elucubrations. They didn't send him to say. 'You will understand that as an OFFICIAL revelation of our presence on Earth is possible in the near future, we need to pay attention to everything that is said during this period of cryptohistorical relations. If such

testimonies were contaminated by foreign facts corresponding to other extraterrestrial experiences (whose reality is foreign to us) it would be clumsy and harmful" (letter D26). They therefore sought other correspondents. To select them, they imagined a masterly test. The "ummites" change correspondent (San José). On May 30, 1967, Sesma received a letter announcing three arrivals of Ummite ships between May 30 and June 3, One of them was to land in the vicinity of Madrid (letter D60 ). The friends of the space visitors waited with the fever that one guesses. They don't see anything. But on 2 June, the newspapers "Informaciones" and "Pueblo" announced the observation of a flying saucer in San José de Valderas, a suburb of Madrid. Not only were there hundreds of witnesses, but he was photographed. But the previous year, on February 6, 1966, an identical saucer had landed at Aluche near Madrid, leaving important traces. The main witness, José Luis Jordan Peña , an intelligent and "open" man, had been very cooperative: He had helped with the investigation. The ufologists were overwhelmed. Peña had become "San José". They came back and killed me.

Rafael Farriols, a businessman from Barcelona, heard the news on the radio. He immediately went to the place, and there found Enrique Villagrasa who, being already one of Sesma's listeners, knew the announcement of the arrival of the "ummites" Deeply interested in the matter, he sought to buy Sesma's documentation, ready to put the price (he had the means). To his surprise, Sesma gave him a full suitcase of documents for a small sum. He was no longer interested in "ummites", too materialistic, and preferred to discuss philosophy with the inhabitants of the planet Auco.

Antonio Ribera, one of the founders of the Centro de Estudios Interplanetarios (CEI), learned of the affair from one of his friends in Madrid, Salvador Texidor, who sent him the article in Informaciones. He went to Madrid, where he met Aluche's witness, and collaborated with Rafael Farriols to investigate. His investigations earned him the trust of the "ummites". After the publication of his book "un caso perfecto", he received no less than ten letters in the following year. As for Enrique Villagrasa, his assiduity in the society of the «friends of the visitors of space» (and his title of engineer) had already made him one of the most interesting - or the most incredible - documents on the "ummite" world. In particular, he had just received that year, five letters, where the ummites recounted at length, at large, and across, how they had discovered the existence of our civilization, how they had explored our solar system, and how they first landed on Earth. We understand that these mysterious letters aroused the interest of ufologists. Copies were circulating. Ignacio Darnaude, a ufologist from Seville, made him the archivist. Dr Aguirre made transcripts and photocopies. This did not suit the "ummites" who feared that their prose would arrive in too learned hands. For sharing too many copies, Antonio Ribera was soon excluded from the circle of recipients. Strange attitude for people who claimed to be extraterrestrials: rather than contact our best scientists, they preferred to write to a small group of Spanish, gullible and docile. Antonio Ribera nevertheless continued to study the file. In 1979 he published "UMMO, le langage extraterrestre". To do more "extraterrestrial", the "ummites" claimed that a hypersensitivity of the fingertips forced them to use the join to press the buttons. It was not too awkward for the elevator buttons, but one would have been surprised if they typed with the knuckle of their fingers (I tried: one minute to type the previous sentence). They therefore claimed to have their letters typed by a typist widely paid for it. Some letters claim to emanate from this mysterious typist, who allegedly wrote on his own about his sponsors. He explained how the "ummites" held him. This made a further "testimony" as to the reality of these mysterious "ummites". An impressive testimony. Another element that argued for this reality while arousing curiosity, was the exciting game of hide-and-seek to which the "ummites" indulged. They had passed by here, would they pass by there? The "ummites" gave information about their location, but not too much. They reacted

to the research of the "ummologists", while telling them that they understood their legitimate curiosity.

Twice the existence of the "ummite" implantation was revealed to the press. First time in August 1968 by Fernando Sesma: "BEINGS FROM ANOTHER PLANET LIVE ON EARTH WITH FALSE PAPERS" headlined France-Soir on 8 August 1968 (note that this month began a wave of UFO sightings in Spain).

Then it was Father Enrique Lopez Guerrero, who said the following month: The "ummites" lived near Madrid in an underground refuge. Of course, he received a letter "We do not wish to alarm you by exposing the small troubles that your articles have caused us following the first information published in the ABC edition broadcast in Seville, nor on the disturbances that the exaggerated dissemination of your testimony can still cause".

Rafael Farriols, new "chosen". )+( Ummo on the roof.

Ummo symbol replaces cross.

Rafael Farriols was deeply involved in the Ummo affair, to the point of spending a good part of his days studying letters and making his house overcome with the symbol of Ummo. He built a "perfume organ" according to a plan given by the "ummites".

According to Javier Sierra in his article "Los secretos del caso UMMO", published by the magazine "Más Allá" ("beyond"), he even created two companies with the names "ummites": Ibozoo S.A and Oemmi, S.A (confirmed by Martine Castello). In 1971 he organized a symposium in a motel in Barajas near Madrid to reveal the contents of the "ummite" mail. This content was in fact broadcast orally, in about sixty hours of reading, by a speaker of Radio-Barcelona, while the corresponding images were projected on a screen. The audience consisted of about forty people, including the recipients of the letters and... José Luis Jordan Peña. The others knew practically nothing about the Ummo file. A French biologist, sent by the GEPA (Groupe d'Etudes des Phénomènes Aériens/Group of Aerial Phenomena Studies), noted the almost total lack of critical mind of the participants over whom Farriols seemed to have considerable influence. This interest of Farriols was "rewarded", and soon it was he who received directly the mail "ummite", in charge of redistributing it in due time. He will not hesitate to destroy some letters without opening them when the "ummites" order him...

the recipients of letters, who became "addicted" to their drugs, organized other congresses in order to make their correspondents "ummites" react. Another symposium was organized in May 1973 in Barcelona. Another in Alicante in 1979 turned a little at the fair, but the "ummites" reacted anyway. Ufologists are looking for the mysterious place where you started. In the 1960s, the Ummo case was virtually unknown to the French public. Only a few ufologists studied the case. Interest will grow gradually, especially because of the amazing content of the letters. With the development of ufological study groups in the 1970s, came the progress of investigations, and verifications. Cases from the 1950s were re-examined, especially the big wave of 1954. But there was also interest in the French side of the Ummo affair. The "ummites" claimed to have landed in France, near La Javie, but we didn't know where exactly. this research, which looked like a scavenger hunt, gave a few ufologists heartbeat. They couldn't find it. And yet...

Yet the existence of the supposed point of arrival, like the incredible story of burglary that followed, were verifiable facts. As were verifiable a number of stories, though abracadabrant, but well earthly, in which the "ummites" claimed to be involved. As was verifiable the existence of their various Spanish correspondents, who could thus realize that the other correspondents cited existed. This made credible the existence of the many mysterious correspondents, not found this time, that the ummites claimed to have throughout the world. Ummo doesn't exist. The "ummites" are falling

apart. Less verifiable were the assertions of the "ummites" on their planet. At least they believed it...

...because their ignorance of astronomy, already visible in the account of their arrival on Earth, prevented them from realizing the inconsistency and absurdity of the description of their system. But what credibility can we give to an alien who does not recognize his star, who does not know the distance of his planet, and who does not distinguish a double star from a star surrounded by two planets? The same as a banker who cannot convert euros into francs ...

A scientist ( ) mixes. Antonio Ribera had provided copies of the letters "ummites" to Claude Poher. He entrusted some to Maurice V. who showed them to Jean Pierre Petit whom he had met in 1974. Very interested in the aeronautical aspect, Jean-Pierre Petit sought to obtain other documents. He found brilliant ideas and obvious mistakes. Others had said the same thing about the Basel documents. As a physicist with a PhD thesis on the subject, Jean-Pierre Petit had studied magnetohydrodynamics, which makes it possible to produce electricity from an ionized fluid circulating in a magnetic field. He was able to imagine reversing the process to cause the flow of fluid, and by reaction, the propulsion of an aerodyne. Reading that the "ummite" machines could propel themselves without sonic bang by controlling the boundary layer and the "shock layer", he thought of the MHD and tried to experience it. Won! His experiments on laboratory models convinced him of the viability of propulsion at MHD. But then the "ummites" would have said true. But then the "ummite" cosmology that allowed interstellar travel had to be true too! Jean-Pierre Petit was deeply involved in this research to the point of claiming that 95% of his theories found birth or confirmation in the "ummite" mail, whose terrestrial origin seemed unlikely to him then. His interest in the science of the "ummites" was soon known to them. they wished his presence at a new congress.

Thus, on November 20, 1985, Jean Pierre Petit took part in the meeting in Madrid where he had the opportunity to discuss "ummite" cosmology with the recipients of the letters. He was encouraged enough to write three articles in the "Modern physics letters", a peer-reviewed scientific journal, but not too demanding. His work did not, however, attract the respect of his colleagues, who were reluctant to discuss "revealed" science. However, Jean Pierre Petit had an abundant documentation; it described the ummite civilization, its language, its metric system, etc., etc. He therefore turned to the general public, and summarized his knowledge of the "ummite" case in a book. Try transformed! Magazines with big prints (but not for big IQ) made a masterful echo. Journalist Martine Castello (who knew what was going on) also released her own book: "the conspiracy of the stars". Antonio Ribera's book was republished. Jean Pierre Petit almost became "Mr Ummo", because for several years, the Ummo file was hardly seen in France that through his work ... and what had to happen happened: he would also have received letters "ummites", convincing and less convincing, the contents of some so much resemble the own claims of Jean-Pierre Petit that one has doubts, especially since he didn't show the originals!

Critics denounce the "ummorists"

Less complimentary was the reception of the ufologists themselves, and of the scientific journalists who agreed to take an interest. For some it went far too far, taking the Ummo case in the first degree. For the others, he had completely left the tracks of Science. Until now, we had hardly seen a complete critical study on the Ummo case, but only on the San José case. Back on the pendulum, after the bold statements of Jean-Pierre Petit, some studies will explode the thesis of extraterrestrials in small pieces: In particular:

- Ummo Special No. 47 of the review "UFO Presence"
- and the book by Renaud Marhic, who, after going to Spain to investigate, published: "The Ummo

affair: the aliens who came from the cold"

But, like many ufologists interested in the file for years, he can not admit that the UFO world could be fooled by a manipulator without scope, so he replaces the aliens by the former K.G.B.

The magazine "Science & Life", after considering publishing a review of Jean-Pierre Petit's book, laid out a hilarious hoax: The unmasking of a "ummite" that had infiltrated the editorial! He had a hypersensitive sense of smell and had betrayed himself by speaking "ummite" and reading with his fingers...

The magazine received about forty letters from readers. Two seemed to believe it, eight asked if the story was true or false, five leaned rather towards the hoax without certainty that it could not be true, a reader had also unmasked a "ummite"! And then there are those who make the contest of the most "ummorist". Thus Dr Kronk Arkaabootz, blurgologue, quotes "the article by Prs Nose and Abond, in the April 1 issue of JOBARD (Journal of Obvious Blurgology and Anatomy Research and Development)" to evoke the strange properties of Blurgonium, Basic material of "ummite" vessels. He was apparently unaware that the electronic structure of the blurgonium has nothing to do with its hypercelerogenic properties due to the transformation of an imaginary number of neutrons into antigravitons under the action of a high-frequency zygospasmodic wave field, as demonstrated by Professor Charles Atan, an undisputed specialist in GAG (Geodynamic Anomalies of Gravity)...and of course there is a letter "ummite"... BLURG: Lamentable Nonsense for the Reserved Use of Gogos.

The mysterious emblem "ummite" )+(. The emblem of the "ummites" appeared with the mention "UMMOAELEWE" in the header of their letters. He also appeared, but a little different on the seal from which he stamped them.

A similar figure would have been seen on Aluche's UFO. It was clearly visible in the photos of the San José saucer. This emblem most probably had a symbolic meaning. But what did it mean, and in what register should we look? If the "ummites" were extraterrestrial, the presence of the emblem on the saucer could be a message addressed to the earthlings. If the "ummites" were earthly, this emblem could be a signature to identify them, like the coat of arms. The search for the emblem was part of the treasure hunt. The problem was not that we couldn't find any correspondence, it was that we found too many...

The mysterious "ummite language". As we have already seen, the "ummites" communicate mainly with humans by letters, but these letters are not written in "ummite" (because they would be as hermetic as the linear B of the Cretans), but in Spanish, or even in French with Hispanisms. It would give a little "Here Ummo, the Spanish speak to the Spanish" if the letters were not enamelled with words "ummites", at least their phonetic pronunciation. To get an idea of the likelihood of the process, imagine that in 1957 a "Russian scientist" (actually a scientific journalist from Ogoniok) wrote to a Frenchman, a fan of the magazine "sputnik", to tell him about the wonders of Soviet space technology. He would write to him in good French (the cultured Russians are good in French), or in a clumsy French, dotted with Russian words written in Cyrillic capital letters. In good French of course. The second solution could only be the work of a joker, taking advantage of the barrier of the iron curtain to give fanciful information while looking very slavish.

Yet it is to a parody of this solution that the "ummites" have indulged themselves since their first letters, never giving only phonetic words, with their translation, and almost never as one might expect, to complete "ummites" sentences, as a quotation. We can conclude from this that in fact the so-called "ummites" do not master the language "ummite", whose grammar they seem to ignore. To use our example, it is as if our joker was in fact a French with a dictionary of Russian, and only the dictionary. And in this case, we're not even sure about this dictionary.



What is "ummite" science worth?

It is said that the texts "ummites" would show a knowledge in advance of ours. More precisely, it is rumoured that specialists - often unnamed - found that some of these texts were of the highest level. Some, because others contain lamentable errors. A critical examination of the available texts leaves a very different impression. According to Claude Poher, only 50% of the ummite claims are accurate, and the knowledge involved is at the level of the first years of licensing. According to Jacques Vall e, their computing is lagging behind ours. As for the total nullity of "ummites" in astronomy, it leaves one wondering: How could aliens come from so far, squeezed into a sardine box, driven by prehistoric computers, and without knowing anything about astronomy? Of course, they warned us: they would not give us any information that could advance our own science, or even prove their existence absolutely. But in doing so, they were supposed to lower their knowledge to ours, but not lower! In other words, in areas that transcend our science, the information provided would be false or unverifiable, in others it would only fit with what we already know. But they do not agree at all, far from it...The "ummites" didn't invent anything. If the "ummites" are so bad at astronomy and computer science, how could they have deceived scientists? How can they look so learned in fundamental physics, and cosmology? Because these "theories" are speculative, and - at least at the time of writing letters- unverifiable. Wrap these texts in a "third-type wooden language" and you will get a very powerful metascience. But popularized in understandable language, these esoteric representations of the universe, these futuristic technologies are they really of an originality that prove their non-terrestrial character? Well no! There are indeed very earthly anteriorities. The illusion comes from the fact that they are disseminated in the immense earth knowledge and that it takes an encyclopedic culture to detect them. In the analysis, the more one seeks, the more the originality of the "ummite knowledge" shrinks like a skin of sorrow, so that an idea "ummite" that seems original, is simply an idea for which we have not yet found the source.

The "ummite" machine goes crazy.

As early as 1978, ufologists had considered disrupting the "ummite" machine by circulating false letters. In fact, a false letter was reported to have been sent to Luis Jimenez of Alicante in 1979. Others will appear in the 1980s, more or less imitated. But also the symbol of Ummo and "ummicity" itself will be "recovered", by mystifiers and enlightened, in short by contactees. Thus the symbol of Ummo would have appeared on a UFO seen in 1989 in Voronezh, observation that a letter "ummite" will ratify, but that had not been announced.

Thus the Swiss Viviane Poli claims to be "ummite", while she is (very) visible, and diffuses a teaching that has nothing to do with that of the "ummites".

Thus the Edelweiss sect engraved the ummo emblem with red iron on the bodies of children. If the "ummites" are so bad at astronomy and computer science, how could they have deceived scientists? How can they look so learned in fundamental physics, and cosmology? Because these "theories" are speculative, and - at least at the time of writing letters- unverifiable. Wrap these texts in a "third-type wooden language" and you will get a very powerful metascience. But popularized in understandable language, these esoteric representations of the universe, these futuristic technologies are they really of an originality that prove their non-terrestrial character?

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The manipulator reveals himself.

José Luis Jordan Peña has long been suspected of having made part of the UMMO file himself. But when we began to accuse him of the author of the letters he recused himself or avoided the questions. He gradually changed his attitude in the 1990s. It must be said that he had been struck by a cerebral hemorrhage that had reduced him, while he was watching the criminal excesses of Ummo's waste pickers. The straw that would have broken the camel's back was a letter sent from Cuba and received on April 2, 1993 by Rafael Farriols, requesting a new meeting where José Luis Jordan Peña, among others, was to be present. He did not come, being - or pretending to be sick - he sent a letter to Farriols or he explained that he was the author of the ummite letters.

One can imagine the reaction of Spanish entrepreneur Rafael Farriols! He demanded explanations. According to Jean-Pierre Petit, feeling that he had gone too far, José Luis Jordan Peña replied: "- Don't get mad like that! It was the Ummites who asked me to do this!" This is the classic escape route in such cases. But the worm was in the fruit... José Luis Jordan Peña decided to reveal his "experience" in 1993, and passed definitively "at the table" in 1996. Lie, lie, there will always be something left of it.

Official epilogue of the case:

After the manipulator's confession, it seemed logical that the case ended there. This is almost true in Spain, but this would be without the "waste pickers" who had taken over from the 1980s. The flow of pseudo-ummite letters has not dried up. It has simply decreased. It is the appearance and the content of the letters that have changed. Compared to the original letters, which were true false, with such a peculiar flavour, there are now false letters, written either by new mystics, which are therefore false "ummites" and false mystics, or by real fools (at least this is simpler). The problem is that these false letters continue to be collected and piously analyzed as true false ones because we could call them "the new ummologists". Worse, they have formed a new informal sect that is very reminiscent of that of the naive Madrid. A new bible strengthens their faith in the extraterrestrial origin of the "ummite" mail and even of the "new mail": the book of Jean-Pollion, "Ummo, real extraterrestrials".

Poor José Luis Jordan Peña...

He still managed to disturb some neo-ummologists, by showing them the originals of the letters. But it is probable that he will not prevent others from dying with their conviction. He himself died on September 9, 2014, in Madrid... taking the rest of his secrets to his grave. His death notice bore both the Christian cross and the Ummite symbol. On his tomb, perhaps one should have engraved (in ummite): "I didn't want this". » We can see in this attack on the UMMO dossier that people have been conditioned to make fun of everything that touches the UFO phenomenon. But when there are sightings, it is easy to stifle the affair because the testimonies of UFOs received by the gendarmerie in France or the FBI in the USA are classified as public archives, so the disclosure of these documents is governed by the laws of the countries concerned. This is why the authorities

and governments have conditioned people so that they do not believe in aliens without being shown at least tangible proof, even irrefutable proof. Visible phenomena in the sky, even at high frequency like in DULCE where there were 2 apparitions per week, can easily be swept away because they disappear right away, so there is no proof, there is no written trace or clear photos. That's why the proof can only come from the progress in digital imaging. But how could such a truth be suppressed by the authorities? When the Majestic 12 (MJ 12) was created in the 1940's at the instigation of the aliens of the underground bases (called EBE: biological entity aliens of Roswell) at the end of the second world war, the American authorities made the blackout, the silence and the censure by trying to convince the scientific world, that the UFOs, the aliens it did not exist. Many scientists (including EINSTEIN) went along with it because it was part of their own game, it bothered them that humans were not the only ones to be the most beautiful, the strongest, which is understandable because if visitors from space were indeed on earth, then the paradox of Fermi was solved, and if they do not show themselves, it is simply that the technological gap was abysmal, besides the Ummites said to Farriols and Sesma, that they would not make an official announcement of their presence to the world because the technological gap is too important. The scientists didn't want to believe it because of their egocentrism, so that their works don't disappear, so that they still have an interest, because obviously if an extra-terrestrial race that has a much deeper knowledge of the universe and that has millions of years of evolution ahead of the human species on Earth, all the knowledge and the research works have no more interest, they might as well put themselves under the extra-terrestrial protection. It is normal, we must put ourselves in their place. But afterwards it was necessary to convey these lies, this criminal intoxication and for that it was necessary to call upon the media, then the learned world spokesman of the Majestic 12 (6 scientists of very high level and 6 military at the top of the hierarchy) and of the secret government (Bilderberg Group, Rothschild,...) misled the media which in their turn in all good faith misled the people who are always there to pay for the others, to be crushed, we saw it with the crisis of the Yellow Vests. We, the tax paying pigs, who get our eyes poked out by law enforcement, so don't believe the official statements about UFOs. The Majestic 12 was responsible for keeping the UFO phenomenon secret and allowing aliens to set up their underground bases and let them abduct citizens. They never disclosed anything, yet they knew about the catastrophe, because some abducted citizens disappeared forever. They let these crimes be committed with impunity. Leading ufologists such as Jimmy Guieu were threatened, intimidated, harassed and died in 2000 officially of cancer. Other ufologists who have investigated thoroughly have been blackmailed into silence, even suffering heart attacks. The scoundrels of the MJ 12 have allowed these abductions to take place.

What is very peculiar in the UMMO case is that there is written evidence with thousands of pages of scientific, literary and philosophical texts sent now for more than 50 years, so the UFO that usually leaves no trace and is observed by a small number of witnesses, falls into oblivion and we can put it on a hallucination, a mirage or other. This is why, in general, the soldiers and pilots do not talk too much and are too pure to pass for fools and originals because they know that it is not very good for their careers. Why? The reputation of an individual is very important in this type of organization. In the UMMO case, there are documents that do not disappear, so skeptics who do not believe in the extraterrestrial presence on Earth point out the inconsistencies that are present and also the basic errors. But the authors of these documents are intelligent, they know that their interest is not to be taken seriously and not to interfere on a large scale, so they give false things, to say that it's anything and things that are below scientific knowledge to say that it brings nothing compared to scientific knowledge and things that are several decades ahead of it, see several centuries therefore that are unverifiable such as the depixelisation of images or the fact that

the expansion of the universe accelerates according to a nonsinusoidal function. These pulsations of the universe predicted in 1966 in the letters ummites. In April 2015, researchers at the University of Mississippi, Lawrence Mead and Harry Ringermacher, announced that the expanding universe could undergo periodic phases of mild contractions followed by dilations. They interpreted this as an oscillation that would subside over time. Of course, we must be very careful with this discovery, which requires validation by other observations. But it deserves to be cited because it will give food for thought to all those who think that the Ummo affair is only a crude hoax...(Sources:

- Science and the Future: The Seven Contractions of the Universe
- Harry Ringermacher site).

A brief summary of the history of the expansion models of the universe with supporting diagrams:

- 1927: we discover that our universe comes from a big bang, then goes into expansion
- late 1970s: we discover that a phase of brutal inflation immediately followed the big bang
- 1998: Two teams of astronomers, led by Saul Perlmutter and Brian P. Schmidt respectively, discover that the rate of expansion is not constant but is increasing, which is very surprising (hence the concept of dark energy). This discovery earned them the Nobel Prize in Physics in 2011 (see Web reference). « In 1998, two teams of astronomers, the Supernova Cosmology Project and the High-Z supernovae search team, led by Saul Perlmutter and Brian P. Schmidt respectively, came to the unexpected result that the expansion of the Universe appears to be accelerating. This result is surprising, because there is no theory to interpret it. It implies the existence of an unknown form of matter whose pressure would be negative, with repulsive behavior and not attractive vis-à-vis gravitation. This hypothetical and unusual form of matter, of unknown nature, is commonly referred to as dark energy or sometimes cosmological constant and currently represents one of the unsolved problems of modern cosmology. In 2011, the Nobel Prize in Physics was awarded to Saul Perlmutter, Brian P. Schmidt and Adam G. Riess for this discovery».
- 2015: we discover that the expansion of the universe would be modulated by a phenomenon of oscillations that attenuate in time (ammortion sinusoides).

However, it turns out that the ummites (who present themselves as extraterrestrials visiting our planet) described this phenomenon in 1966 (yes, you read it well, in 1966, that is, half a century earlier...) in one of the many letters they wrote, the letter D41-15 mentions it without any possible ambiguity:

« On the other hand, we indicate that there was an explosion. Indeed: the immense mass of each Cosmos is fragmented into particles and these fragments, brutally expelled millions of years ago, constitute the current Nebulae or Galaxies that move today at an ALMOST CONSTANT SPEED. You can observe that we underline this "ALMOST" when your astronomers judge that the speed<sup>2</sup> must be CONSTANT or UNIFORM based on two false reasoning:

A- The movement of the spectrum bands in the observed galaxies is CONSTANT and oriented towards the RED.

B- It seems logical to think that if nebulae are not driven by a Force Field (S41-32a), because they are from an initial explosion of the universe, they will move with a uniform velocity by inertia. But these two premises are false and ingenuous.

A) your measuring devices are not very precise, otherwise you would have observed that the shift of

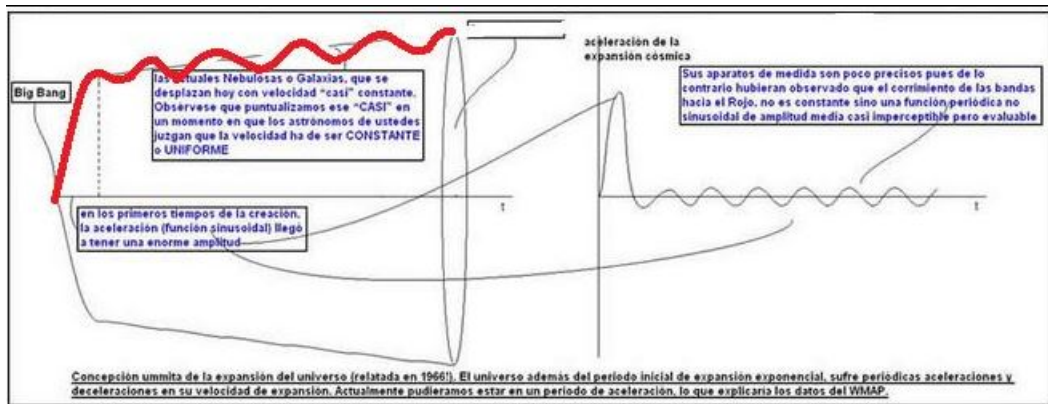


FIGURE 68: Expansion of the universe with oscillations caused by the twin universe (red curve)

the bands towards red is **NOT CONSTANT**, is a **nonsinusoidal periodic function of mean amplitude** almost imperceptible, but **EVALUABLE**.

B) you have not taken into account that our twin Cosmos exerts an "influence" on our galaxies. Precisely on UMMO, as we will tell you, we discovered the UWAAM from these interferences. This interaction prevents our nebulae from moving at a uniform speed<sup>2</sup>. (speed<sup>2</sup> = acceleration). So the measurement you make of the age of the universe is inaccurate because you use as parameters this current pseudo-speed<sup>2</sup> constant of galaxies and their distance from the EARTH. Plus the fact that NOW speed<sup>2</sup> is almost constant, in the early stages of creation acceleration (sine function) came to have a huge amplitude.»

We thus find in the ummite letter of 1966 this periodic modulation of the expansion of the universe, modulation whose effect would be attenuated in time.

The letter of 1966 was so precise that the Spanish recipients of the letters had arrived in 2008 at almost the same pattern (to the variation of ready amplitude) as that which illustrates the article of the magazine "Sciences et avenir" ("The Science and Future" article) of 2015.

Thanks to the given curve (FIGURE 68), we see clearly the stages of the expansion of the universe. In the early stages of creation acceleration (sine function) came to have a huge amplitude, it is called cosmic inflation which is a cosmological model fitting into the Big Bang paradigm in which a region of the Universe comprising the observable Universe experienced a very rapid expansion phase which would have allowed it to grow by a considerable factor : at least  $10^{26}$  in an extremely short time, between  $10^{-36}$  and  $10^{-33}$  seconds after the Big Bang. The current nebulae or galaxies that move today with a "near" constant velocity, note that we emphasize that "almost" at a time when your astronomers consider that the speed should be constant and uniform but in fact there is a slight acceleration that oscillates with time what we know since 1998 for the acceleration and 2015 for the oscillations.

The expansion of the Universe is modelled by the theory of general relativity. It stipulates that the Universe as a whole is subject to the forces imposed by the various forms of matter that compose it and that it cannot therefore remain static: it is either driven by a centrifugal force that causes it to expand (expansion following the Big Bang and which could lead to the Big Rip), is devoid of such a force, and then its centripetal forces of gravitation will take the upper hand on the expansion and will cause the Universe to collect itself until the Big Crunch. Within the framework of the most classic universe models, notably that of Friedmann's universes, expansion slows down over time.

Conversely, the expansion of the Universe exerts an influence on the density and pressure of this matter. Thus, it is the knowledge of the physical properties of these forms of matter (in particular, their state equation) that makes it possible to predict the behaviour of expansion. The equations that describe it are known as Friedmann's equations. The observations make it possible not only to know the current rate of expansion of the Universe (the value of the Hubble constant at the present moment), but also that of the Universe in the past, indirectly providing information about the forms of matter that fill the Universe.

The reality of the expansion of the Universe has not been readily accepted by all scientists. Indeed, this expansion implied that the Universe was born of the Big Bang and, for its detractors, this absolute «beginning» seemed to contradict the rationalist and materialist position of science, because it could, in their minds, to serve as an argument for the idea of a divine creation. These opponents of the Big Bang preferred, for this reason, a static and eternal model, without origin. Alternative explanations, known as “tired light” (a term proposed by Richard Tolman in 1930), were proposed to reconcile the static universe and the red shift from the discovery of the expansion of the Universe in 1929 until the 1970s.

Since no satisfactory solid theory with cosmological dilation of time could ever be constructed in this sense, these explanations were abandoned by the scientific community.

Other scenarios of the evolution of the cosmos are also considered. Thus, regarding the theory of the expansion of the Universe, Jean-Marc Bonnet-Bidaud comments: “We observe a shift towards the red of the light of distant objects and we deduce that the Universe expands. But this interpretation is only one of the possible hypotheses and we do not necessarily need to have an expanding Universe to obtain this shift to the red of light.” These discoveries are therefore very recent, general relativity was not enough to describe so precisely as the universe evolved further the Big Bang. EINSTEIN said on this subject: “There are two things that are infinite: the universe and human stupidity, although for the universe I have doubts.” As a result the assumption that it was Peña who wrote that letter in the '60s doesn't hold water. No top physicist could have displayed such a thing back then. If the periodic variations of the expansion of the universe are confirmed, there is not a single cosmologist in the world who would disagree with the fact that this was absolutely unpredictable for a earthling in 1966. Or maybe this earthling had a good crystal ball! On Ummo, the discovery of these variations led to the validation of the theory of a twin universe. So maybe we're about to follow in their footsteps... Once again, only progress in the field of galaxy imaging can betray the strategy of the Ummites, dictated by a superior intelligence which consists in mixing, like a cocktail, gross errors on simple things and information too far in advance and unverifiable because of the inaccuracy of the measuring instruments of the time. This is the case of the acceleration of the expansion of the universe (non-sinusoidal) which was unverifiable in 1966, and which ended up being detected in 2015, and it is the case currently with the curvature of the universe which the vast majority of scientists say is positive when in fact the Ummites are saying on Twitter that the researchers didn't take the measurements in the wrong place based on the data from the Planck satellite, hopefully this mistake doesn't will not happen again with the James Webb Space Telescope which was successfully launched in December 2021 by the Ariane 5 rocket and which is now operational, because its 18 mirrors are aligned. It is exactly the same for the ADAMSKI case where the germ of self-destruction was of a lesser level, concerning the planet Venus, where the first probes arrived a few years after the death of ADAMSKI and measured the temperature of over 400°C. From 1952, he claims to have been contacted by the occupant of an extraterrestrial vessel. Adamski claimed to have met this "man" several times, Orthon the Venusian, who took him for a ride in his vehicle and gave him messages of peace, saying he was concerned about the nuclear tests

of the United States. In the 1950s, little was known about Venus because the planet was constantly shrouded in clouds. One imagines a very humid atmosphere, forests populated by large reptiles and the possibility of human life. This vision will be abandoned after the flyby of Venus by the Mariner 2 probe in 1962, the first landings on Venusian soil in the 1970s and the measurement of a temperature of some 450°C. Here again, the extra-terrestrials who were not the Ummites, but who had a morality and a desire for non-interference told Adamski that they came from the planet Venus so as not to disturb the terrestrial human conscience knowing well that they would discover that Venus is uninhabitable twenty years later. The Ummites did the same by giving information which they knew would not be known for fifty years. For skeptical ufologists, extraterrestrials should announce their presence officially immediately upon their arrival on Earth, they argue that we have never seen them in flesh and blood apart from José Luis Jordan Peña, Georges Adamski, Claude Vorilhon. Do I believe what I see or do I see what I believe? A great philosopher, Thomas Aquinas, nicknamed Saint Thomas, claimed that he “believed only what he saw”. It’s just. Let’s take a concrete example. A man and a woman kiss on the sidewalk. You see them kissing, you can believe that these two love each other. You’ve seen it, you believe it. Afterwards, if it was a mistake, like for example two actors who shoot a movie and who play a couple in love, you can always say that they kissed “as if” they were in love. Saint Thomas was right. He wanted to have proof by his own senses of what was being said. He didn’t believe everything Facebook said, or the neighbor who saw the third man (that’s older, Greek to tell the truth, Plato for those close to him). These men were said to be “philosophers”, which literally means “lovers of wisdom”.

Epicurus, another genius who reflected in his Garden, had defined philosophy as the work of “alleviating human suffering”. A “mind therapist” of sorts. But precisely the Ummite extraterrestrial expeditionaries do not speak, they stop speaking at the age of 12, and they talk about it that these weak phonetic capacities were a problem to communicate and present themselves visually when they arrived on Earth. Antonio Ribera also tells Jimmy Guieu that one day he had dinner with a head of interpol, a German gentleman who told him that he swallowed files like that on guys who traveled with Norwegian, Danish and Swedish passports, and who wore a small device in their throat to help them speak. The Ummites who arrive on Earth are never the same, they follow one another in the different expeditions, they wear this device which gives them a nasal voice, we can also listen to available voice recordings. Ribera asked the interpol director why they follow these people if they are not criminals; he replied that it was to please the CIA who had asked us. So the CIA was aware and knew that there were Nordic-looking aliens on Earth. Guieu then specified to Antonio Ribera that we know since we learned of the existence of the MJ12 and secret government that all nations have relations with each other and are accomplices, who exchange information to deceive and lie to us. The CIA was interested and had infiltrated the Ummites. But the Ummites neutralized the CIA agents who knew, and who had physically seen them. They went into pre-retirement, they received implants. That’s why there is never physical evidence because it evaporates when the contactees who threaten to throw everything away are put out of play. According to G.Andrews, a leading American ufologist, the abductions of American citizens were done in exchange for military technology of extraterrestrial origin, but the members of MJ12 understood that the abducted citizens had received implants which allowed the grays to control as we control wild animals. There were many more American citizens abducted than expected and so the situation had gotten out of control. It was at this point that there were disputes within the MJ12 between those who wanted to continue to cover up the affair (the compromise with the *petis gris*) and the others who wanted to tell the public everything to warn them of the disaster. It is believed that the Ummites used similar techniques to neutralize CIA agents who were a little

too interested in their study of Earth civilization which began in 1960 and is expected to last 1 century. But they were just pre-retired, so they weren't killed or experimented on. The AM1 and AM2 amoral races, on the contrary, want to make Earth humans future servile slaves. The Ummites said he wouldn't allow it, that means they consider themselves guardians of the Earthly species, and when a person is put under guardianship, they are protected by that guardianship. OYAGAA AYOO YISSAA said that it would take 180 Ummites to take control of the nations, knowing that the AM2 amoral race has several million years of evolution more than the Earth race (about 8 million years against 4.5 million for us), if the Ummites let it happen, we would be cattle for the two amoral races. But that's what we already are, so don't worry. Jean-Pierre Petit's first book on the UMMO case dates back to 1991, more than 30 years ago now. It is not that time is accelerating, it is simply that the technological advance of the Ummites is several centuries, it takes time to reach their level. The protagonists of this case have been manipulated like Peña or Sesma, they are all dead and Jean-Pierre PETIT is 84 years old and will soon join them. It's thankless to have devoted your life to an epilogue that we won't see. AND this is what readers of best-seller wrote in 1991: "Enquête sur des extra-terrestres qui sont déjà parmi nous: Le Mystère des Ummites" (ENGLISH) "Investigation of aliens who are already among us: The Mystery of the Ummites") published by Albin Michel.

Reader n°1

« That a high-level scientist like Jean-Pierre Petit plunged into the Ummo affair to the point of turning it into a Book on the existence of extraterrestrials (the Ummites) present on earth is a real mystery. In his defense he wrote his "survey" in 1990-91, two years before an obscure Spanish telecommunications technician José Jordan Penã confessed to being the author of a vast deception from 1966 to 1988. Other people in the world have extended the hoax a few years later, 25 years of correspondence with the means of the time, typed letters and phone calls by the very prolixes Ummites ....

Let us say that Ummites landed in a nave on our small planet and wanted to let it be known in one way or another. Why address an Iberian esoteric circle and not the representatives of the great powers of this world? Why hide in a cave near Madrid or Barcelona like primitives when we crossed the interstellar immensity?

Why type letters when you have a technology a few centuries ahead of what their trip in light/years proves? And why write hundreds of absconses pages sprinkled with scientific theories still poorly sketched by the CNRS or NASA when it would be easier to explain to an International Scientific Council how the nave transported them in the Iberian Sierra? Afraid of getting busted in the Kalashnikov by terrified earthlings? Afraid to end up locked up in a hangar in Area 51 or erased like in Roswell...?

Frankly I still prefer to believe in the «small grey» discrete ,nyctalopes and wall-hanging...

However, I have my own idea of the scientific discoveries made by Jean Pierre Petit after his analysis of the ummite writings. He himself admitted it when he noticed with the great mathematician Souriau that the great theoretical advances in physics, mathematics or cosmology are made... during dreams.»

Reader n°2

« I had in its time already read this kind of book on this "Mystery", even now I am skeptical, is it manipulation? possible. Take a look at the "Futur en Folie" twitter account to give serious leads. For me it's a gigantic masquerade organized by 'OYAGAA AYOO YISSAA' My conclusions are simple and clear, we have our free will, and to believe or not to believe is therefore a personal option? For my part, all this is a masterful pseudo organization The beginning for me comes from



a lover of Spanish esotericism, Fernando Sesma It's up to you to form an opinion....»

Reader n°3

« Can be read like a novel or like a true story. In any case, this book challenges because it is difficult to find that it could have been the motivation of the different people who were the first to relate the facts before years later this book was written... It is also difficult to understand why such numerous, complex, hidden or coded messages would have been left to humanity even if the book offers some answers. It is up to everyone to make up their own mind after reading this book.»

Reader n°4

« It may not be the best book on extraterrestrials but it is well written and comprehensive on the subject. The style is sometimes a bit off-putting (long sentences, not enough conciseness, ...) but that didn't bother me too much. I learned a lot of things on the subject and that's the main thing. For those who want to know more about extraterrestrials, this is a book that belongs in any good library.»

Reader n°5

« According to this book, reality far exceeds fiction and we can't say anything, the arguments are there, we don't know how to dismantle them....it's simply amazing but unverifiable...some will say:" we don't believe in it or we don't believe in it" but it's not a question of belief, it's a phenomenon to be studied, analysed.... and when we are sheltered like me from any belief religious and well we can only agree with the conclusion of the author .... As Sherlock Holmes said, when we have eliminated all the possible hypotheses, the last one which remains however implausible IS the explanation ..».

Reader n°6

« However, I think that the authors of the Ummite letters are nothing but a group of earthlings. But that they are under the telepathic influence of extraterrestrials or beings from beyond space, channeling style. Which would explain the advanced science that lies in their prose.»

Reader n°7

« Excellent book. Jean-Pierre Petit comments on his work made from Ummite texts, everything is clear and well explained.»

Reader n°8

« Excellent book. Jean-Pierre Petit comments on his work made from Ummite texts, everything is clear and well explained.»

Reader n°9

« Book received on time and well packaged. The cover and the pages are of good quality. On reading we understand or want to come to the author, interesting.»

We see immediately that despite the excellent reputation of Jean-Pierre Petit, the first commentators to see read or re-read his first book on the Ummites have doubts about the extra-terrestrial origin of the authors. The comments of the reader n°1 are very interesting and are more advanced than those of the author of the diatribe of the UMMO file where he turns everything in derision. There, the reader makes no mockery. He points out that José Jordan Penã confessed to being the author of the letters from 1966 to 1988 and jokers extended the hoax. He wonders why, the Ummites did not contact a scientific council by presenting them real material elements, at least tangible. D'First the Ummites contacted scientists who did not believe them and then, they could see the abysmal technological gap that existed at the time and still exists today despite the progress made over the past 50 years, they had told Farriols in a condescending tone: 'There is bionics, but you won't see it,' so this means that artificial intelligence is being presented as a revolution by the media and the whole scientific community and by the web giants who hire the best ice makers in the world;

For the Ummites it's an old-fashioned trick, otherwise said in 2020, in leaving the Middle Ages. If the reader who has expressed himself thus replaces the letters Ummites explaining briefly the functioning of their nave in this context, then understand that it is useless to explain a technology in detail, if factories are not able to produce basic components, if engineers are not trained and if the scientific basis is unknown. In the 1960s, computers were not quantum, there was no theory that unifies the infinitely large and the infinitely small, even today, scientists do not master the interactions between atoms, they do not yet know how to explain quantum entanglement and use it for space travel technique, and they do not yet know how to maintain magnetic fields of more than 30 teslas for a long time. Neodymium-iron-boron magnets, commercially available at low prices, produce magnetic fields in the tesla range. Each magnet used to bend the trajectory of particles in the LHC particle accelerator produces a magnetic field of 8.4 teslas. Named after the Serbian physicist Nikola Tesla, is a unit for measuring magnetic fields. It is a derived unit of electromagnetic induction (sometimes called magnetic flux density or magnetic field) from the International System of Units (SI). However, the tesla, T, is more commonly used today to define the intensity of a magnetic field. The nuclear magnetic resonance spectrometer, the most powerful currently on the market, was installed at the European Centre for Very High Field Magnetic Resonance (CRMN)<sup>2</sup> in Lyon in October 2009 with a field of 23.5 T.

The world's most powerful, non-destructive, pulsed magnet, located at the National High Magnetic Field Laboratory in Los Alamos, New Mexico, generated a 100 T field for 15 ms in March 2012. Some neutron stars, magnetars, can reach inductions of the order of 100 gigatesla. Although their existence has recently been demonstrated, gravitational waves are not yet accessible in the laboratory. There is still work to be done so that the rantings described in the Ummite letters lead to the construction of a spacecraft which is superior to all our future ships, at least that is what the Ummites said in the 2000s. Currently, the terrestrial scholars even if they do not have such a deep knowledge of the universe as the Ummites are not very far from being able to travel between the stars or to detect the signals emitted by extra-terrestrial civilizations, they pass to side because of bad settings and because they do not take measurements in the right place, there is no harmony between the designers of the sensors and the personnel who use them. But the technological ingredients that the Ummites use for their travels are not very far from arriving according to them, probably by 2050, which corresponds to the end of the Ummite study period on Earth (i.e. 1 century: 1960-2060). But beware there is a big difference between being able and going to the end of the technology and having technological ingredients; in addition you have to know the roads that lead to the planet you want to visit. The Ummites gained access to this technology with the help of another more advanced extra-terrestrial ethnicity as their IBOZOO UU theory was in its infancy. If they do not deliver the technological secrets, it is not for any continuation. Without the help of more advanced extra-terrestrial races who controlled the access routes to Earth, the Ummites would not have achieved the status of travelers between planetary systems. DOOKAĪANS are the aliens friends of the Ummites and more evolved who come DOOKAAIA is the collective name given by the Ummites to 3 ethnic groups collaborating on a planet they have "terraformed". None of the 3 are currently active on Earth. The Dookaians have impelled technological and spiritual progress among the Ummans. They are biologically more advanced than the Ummans by at least 4 million years. Their technology is far superior to that of the Ummans. It is thanks to them that they mastered the journey that led them to Earth. DOOKAAIA (TOOKAAIA, DHOKAAIA), a cold star (planet) in the Zeta Herculis star system (a binary star in the constellation of Hercules) where three peaceful peoples collaborate; the first extraterrestrial contact for Ummo (letter NR-13). Their planet probably revolves around Zeta Herculis B which is less hot than Zeta Herculis A.

excerpt from letter NR13:

«(04/14/2003) The first official contact with OEMMII from another planet occurred in the year 75 of our era (approximately 1255 Earth years before the present date [...]) by peaceful brothers from the planet DOOKAAIA in response to signals from OUMMO. 11 XEE before that, they had sent two automatic ships on preliminary reconnaissance to check our reaction in response to a patent and non-fugitive incursion into our airspace. Prior to that, our planet had also experienced what you call the waves of UFOs which are UFOs sent on reconnaissance by the traveling OEMMIIs from various planets in this galaxy. The contact with our brothers from the planet DOOKAAIA was official [...].»

So the Ummites also experienced a wave of UFOs, but it was not ridiculed and kept under wraps unlike what has been happening on Earth for 70 years.

Letter NR-13 (other extract):

« We are indebted to these brothers for an acceleration of our technological development thanks to their theoretical contributions to our cosmological model, then in its infancy, at the level of the theory of the IBOSZOO OU and of the decadic structure of the WAAM-WAAM. Thanks to them we were able to master the process of reversing the orientation of the axes of the IBOSZOO OU (OAWOLEIIDAA) and thus build our own OAWOLEA OUEWA to explore our galaxy and the other WAAMs. The interference in our evolution was minimal, limited to the impulse of already advanced theoretical works, and because our brothers of DOOKAAIA had judged our social stability sufficient to allow us to reach a higher level of technology, although still much lower than theirs.

Our brothers from DOOKAAIA also gave us an impulse in the psycho-emotional field because we were at that time an eminently pragmatic people and our understanding of WAAM-WAAM omitted the integration in our global cosmological model of the transcendental components that are WOA [God-Generator] and BOUAWA [soul]. They encouraged us, without however directing us towards the solution, to perfect our knowledge of cellular biology and biopathology because, and it is now also certain for us, the comprehension of WAAM-WAAM requires the complete comprehension of the biopsychological functioning of the OEMII (human body taken in its indissociable material and psychic aspects).»

The DOOKAIANS agreed to help the Ummites because their social stability was compatible with a degree of technological advancement; this is not the case of the nations that still do not want to give up nuclear weapons. It is very easy for aliens to remotely deactivate nuclear weapons, which is what has been observed by military personnel during numerous UFO flybys over sensitive military installations. The Ummites who have mastered antimatter bombs can vitrify the Earth.

They also talk about the death of the first DOOKAAIA expeditionaries on UMMO in letter D41-1: «(1966) The inhabitants of UMMO have a body whose physiological morphology is surprisingly similar to that of the terrestrial "Homo sapiens". This is logical if one considers that similar biogenetic laws prevail throughout the universe. When the OIWI (year) 75.231 of our time [...] arrived from the space ships of the planet TOOKAAIA, their crews, although they died, presented however the same cellular organization.»

Tweet OT-99 of OOMO TOA «(02/12/2017) We commonly name DOOKAAIA the OYAA [planet] where 3 KAAIOEMMII (friends) peoples collaborate. This star, originally sterile, is located in the star system HD 150680 (Zeta Herculis). The more advanced brothers who share our refuge in Antarctica do not take an active part.»

Tweet 312-37 «(13/02/21) As a direct consequence of the OYAA, we must develop life around us, helping OYAA with primary life to evolve gradually, and even seeding barren worlds when possible.

This is our main goal as OEMMII. DHOKAAIA is a shared experience to practice and improve our knowledge of geofomation.»

The DOOKAĪANS at least 4 million years older than the Ummans in terms of evolution. If they wanted to destroy the earth with anti-matter weapons or simply to enslave us, they would do it with their fingers in their nose, but they are part of the friendly races who travel freely (in TURQUOISE COLOR with a yellow dot on the former diagram of civilizations and in GREEN on next map of civilizations) with a high degree of morality.

We list the extraterrestrial species in order of arrival on Earth.

1. THE DEUXIANS (since 31700 BC, the Reptilians). They are related to the ancient Egyptians. They may have performed genetic "interventions" between several "populations" to accelerate our cortical evolution. If they did, we don't know if these "interventions" took place between 2 terrestrial populations or between them and us.
2. THE IOXIANS (since 896 years BC). More evolved than the Ummans, they probably do not resemble us enough to mix with us. They share the Umma Antarctic base and are therefore a priori part of those who try to protect us.
3. FRANESIANS/IEYIOBAAIANS (since 561 AD). They come from 70 Ophiuchi. First ethnic group visited by the Ummans after their access to interstellar travel. They are probably friends.
4. THE URELENIANS (since 1550)  
Linked to the SINOD case, their extraterrestrial origin is not certain. Certain elements of SINOD's testimony are "clearly invalid". It may be a matter of "mind control".
5. THE SONNETS (since the year 1721). Coming from \*Beta Hyi (HD2151), these small aliens (42 cm) made only atmospheric observations.
6. THE "COMPLEXES" (since the year 1906). Of very small size, macrocephalic with grayish skin. They have descended with frequency on our soil. They have a high cultural and ethical level and are undoubtedly friendly for this reason. They are not the Roswell Greys.
7. THE GOHOIANS (arrived in December 1948). Small, with atrophied arms and enlarged heads. They reside in underwater bases. They have visited us more than all the others combined. They have performed a few abductions without harming the human guinea pigs. As we shall see, these Gohoans can pose us certain problems.
8. THE UMMAMANS (for the record) (arrived in February 1950). You already know everything about them.
9. THE ISSIANS (arrived in 1962 and left in 1980). With a physical appearance similar to ours, they mixed with us in the USA, in the former USSR and in India. They left in 1980.
10. THE MYSTERIOUS (arrived between 1943 and 1978). They have the same goals as the Ummans, but have never communicated with us. They are possibly the foo fighters of the second world war.

11. THE SALIANOS (arrived between 1943 and 1978). Without doubt the most documented race. They performed psychological experiments on the first Spanish recipients of the Umma letters. They gave the answer to the Umma coded question validating their ET origin.
12. THE GREYS (arrived before 1948). The Ummans were mandated by one (or more) more advanced race(s) probably to prevent these Greys from signing an agreement with the USA. This agreement, which would have been in our disadvantage... was however signed in 1954 with the Eisenhower administration. This affair earned the title of "unreliable interlocutors" for the Ummans.
13. THE WVALAIANS (arrived in 1963)  
Coming from an uncatalogued star located 27.8 light years from Earth. They have come down to Earth only on limited occasions, notably in Chile.
14. THE MAROUA (present since at least 1988)  
One of the ethnic groups watching over our planet. They dematerialized an imposing nave, from a race that was probably ill-intentioned, above the city of Maroua in 1988. Their technology is beyond the understanding of the Ummans.
15. THE DOOKAĪANS (date of arrival unknown). DOOKAAIA is the collective name given by the Ummans to 3 ethnic groups working together on a planet that they have "terraformed". None of the 3 are currently active on Earth. The Dookaians have impelled technological and spiritual progress among the Ummans. They are biologically more advanced than the Ummans by at least 4 million years. Their technology is far superior to that of the Ummans.
16. THE EXO-PAYSAGISTS (date of arrival unknown). Civilization with high morality that creates crop circles. These field works want to draw our attention to the existence of extraterrestrials and warn us of certain dangers.  
THE OTHER RACES:  
The FEEXEEEEEN, civilization disappeared after collective suicides.  
The OYAWIENS, who killed a human crew.  
The OYAEBEEMIENS, who made the big mistake to vitrify their planet!

(\*)Stars quoted with characteristics on the following two maps (FIGURE 69 and 70)

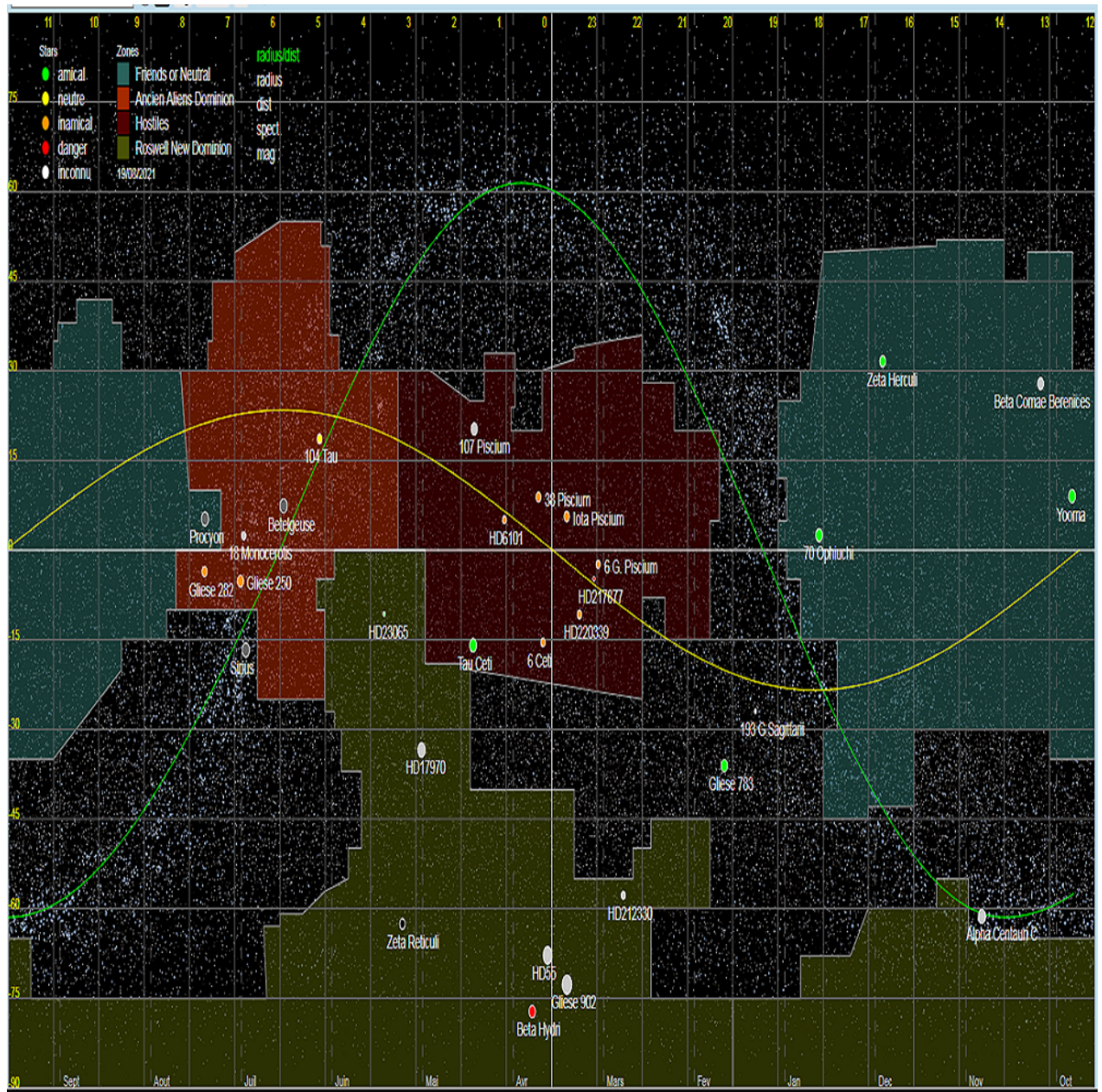


FIGURE 69: Positions of the stars of each of the extraterrestrial races

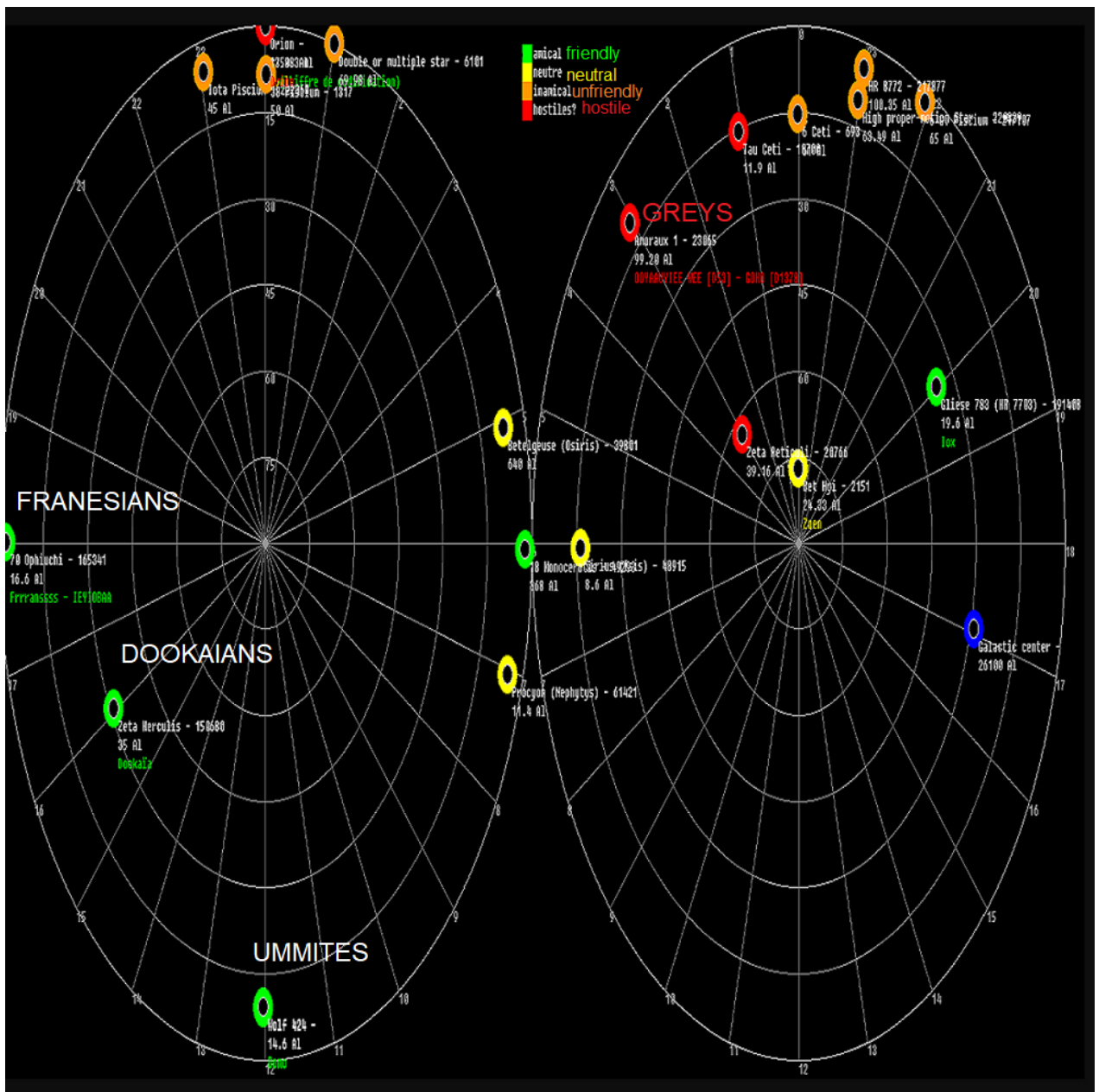


FIGURE 70: Names and distances of the stars around which their inhabited planets revolve (e.g. planet around Tau Ceti (located at 11.9 light years) colonized by hostile aliens called "GREYS")

Now let's go over the contents of the letter D69 below.

In spite of this, high cooling values must be achieved with the help of transpired lithium evaporation. The technique which allows us this effective control of the gaseous or liquid contour of the spaceship is censored in this merely descriptive document and its scientific bases are not known by the specialists of the Earth. (SEE NOTE 11)

History of the UMMO case

They are Ummans, but humans of the Earth are creatures of Satan (666) on a planet that should never have hosted life...

They have a human appearance, very similar to mine, to your the "humans" of the Earth, they have an appearance of Nordic type, that of the peoples of northern Europe, especially Danish (Mette Frederiksen), but also Norwegian (Lene Marlin), Swedish (Agnes Emilia Carlsson) as is easy to see by observing the cover photo of one of the first expeditionaries on Earth: ADAA 66, 22 terrestrial years old in 1950, and tragically died in an unpredictable accident on November 6, 1957 in Yugoslavia. PHOTO of ADAA 66 (THE CREATION OF GOD), 22 years old in 1950 and died on November 6, 1957 in Yugoslavia. The poor Nordic-looking alien died like shit on a rotten planet, populated by big terrestrial human shits, which should not exist. His death is a disgrace, and a disgrace to all alien races in the galaxy. The poor Nordic-looking alien died like shit on a rotten planet, populated by big terrestrial human shits, which should not exist. His death is a disgrace, and a disgrace to all alien races in the galaxy. His death confirms that this earth race must be eradicated from the galaxy and we will exterminate it with anti-matter bombs, so that all life forms will disappear for good on Earth, which will be an inert rock everywhere, for billions of years until the end of the life of the Sun, which is too hot a stove for a planet to support life naturally.

Life is like a flame that ignites, it is orange in color, the optimal conditions for life to appear are those found around orange dwarfs, stars that are less bright and less hot than the sun which is a yellow dwarf. Red dwarfs like Wolf 424 are not hot and massive enough for life to orbit around them.

The Ummites claimed in their letters to come from a planet located 14.4 light years from Earth but this planet Wolf 124 is famous in the ufological community because of its connection with the Ummo case. However, this system is not likely to harbor an advanced extraterrestrial civilization, nor even life, on one of its hypothetical planets; due to the fact that these stars are red dwarfs, whose minor member (Wolf 424 B) is of the eruptive type. And so when they claim to have chosen this star not to give a credible planetary system, they know that their star is an orange dwarf on the one hand and that the sun is too hot a star. And when they claim to have chosen the name (phoneme) UMMO which means SMOKE IN SPANISH, they know well that smoke is generated by fire and the flames of a fire are of orange color, the famous expression: There is no smoke withOUT FIRE! Eleven reasons to read Aliens among us:

A high-level scientific thesis which highlights the considerable progress made by tetravalent logic in certain branches of mathematics and in a better understanding of the structure of the cosmos, and by ricocheting that shows that the Ummites are not Spanish esotericists pursuing a collective delirium over several generations and that the UMMO case is not a hoax.

A giant UFO in orbit - It's an incredible sight - a white clock dial is bleeding through the thin cobalt sky. The psychic trail is suspended in the high and thin stratosphere, a icy cirrus of time. Somehow, I understand that the government knows everything about it, but has kept it secret. Now that The clock in the air has been "unleavened", one cannot deny its existence. Is it an alien



spaceship? Maybe - or it could be something much more Significant: A sign of Deity.

Nazi/alien collaborations - I find myself inside the command module. a metal corridor, a series B movie set from the 1950s. composed of a curved corridor in polished steel, matching German signs - "Actung!" - in a typical Luftwaffe font. Know that I, instead of Adolf Hitler, Paris and the 30 largest cities of France would have been reduced to ashes the first months of the invasion, and the maternities first, and then, once the population was exterminated, I would have ordered the Luftwaffe to impose a peace on the English against France, if they had refused, I would have bombed the military targets until the British defences were exhausted so that the invasion of the British Isles was child's play.

Abductions by aliens - I get up from the table and see my reflection in the polished metal walls. walls in polished metal. I am exactly as before; the test leaves no mark or invisible scar. invisible marks or scars. And yet, something has changed. I see the future as contained in bright drawers of hybrid human-insect fetuses.

Human/Alien Hybrids - We have just learned that the DNA of all humans on the planet the planet has been converted into that of an insect. We feel unchanged, but I comments to those around me that the external transformation will soon begin. The site New genetic code is going to turn us into new beings. And of course, I'm right. The scene changes and I find myself above Allison, in a coma. She is bare, covered with damp dirt. I clean it with a sponge, revealing the beginning of growth the beginning of the growth of an exoskeletal thorax. "We're all going to look like this soon". think to myself..

Mind control - "These technologies cannot be repeated, prevented or even revealed using current market technologies. Onbeam systems have been infiltrated with clandestine access points, where operatives use fluoride to penetrate unconscious brain treatment centres. of the brain. Those of us who are victims of this mind control have found our attempts to combat the conspiracy regularly thwarted by technology that can penetrate EM and acoustic shields, move objects remotely, remove legs under people remotely, propel a moving car to the side, make objects disappear and reappear in a new place. make objects disappear and reappear in a new place, apply sufficient force on a building He makes slamming noises, especially at night when you fall asleep. fall asleep, burp or vomit people when they least expect it, usually in public places where there are a lot of people. in public places where there are many people, break down household appliances shortly after the warranty expires and give people sunburn in cloudy weather. cloudy."

Space Religious Insects - The Giant Cicada stands on its hind legs legs, revealing an exoskeleton of plates armoured with the tint of a faded grey. faded grey. A vibrating membrane on his chest emits a hoarse and whirring voice. chest. "First remove the log from your own eye, then you can help your neighbor to remove the stain from his." A Mad Scientist - "He offers free water, but don't drink it. It's just a trick to introduce a new version of Fluoride in the population and create the world's first private deity."

An evil CEO - "Oh, Buckstop is crazy. He's the epitome of the Narcissistic CEO. ... Buckstop uses Summons Replisystems and Fluoride9 to take control of the infrastructure of the beam and stage a total invasion of the enterprise of the collective unconscious. Its goal is to dominate the world."

A journey through time, a monster with the green skin of the unconscious - A strange wind A strange wind blows through the concrete silo, filling my nostrils with the 1942 salt air 1942 and the stench of the corroded metal of the U.S.S. Ethan Allen Hitchcock. I can hear the ozone gas whistling and crackling from the vessel's main reactor while The green Fiend comes forward, exhaling crimson smoke and sparkling pieces of magnesium. magnesium.

The End of the World - We rise in the sunlight as Lucifer escaped from hell.

The alien gets me back on my feet just in time to see the tornado tower collapse. It is a horror, a tangle of metal and anxious cries of machines. The Turboprop pulls away from its moorings and flies, flying into the nearby pasture. in the nearby pasture. Suddenly, the ground rumbles. Buckstop missile soaring in the sky on a pillar of fire. The stuttering roar of the the explosion of the rocket shakes the earth for miles, driving birds from the surrounding pastures and triggering alarms from nearby cars. A moment later, there was a bright flash, a huge explosion just beyond the line of trees. It's the the dramatic volcanic eruption of my dream, another incredible revelation. Crimson the crimson fire falls on Strangers Rest. The roofs are on fire, including probably my house. I can imagine its multi-gable roof exploding in flames. Lucifer is the sun that feeds the life of this filthy Earth race, cursed, rotten to the bone.

The hypothesis of the existence of this extraterrestrial civilization has been taken seriously and continues to be so by some ufologists although it was refuted in 1993 by José Luis Jordán Peña presenting himself as the author of what he described as a hoax he allegedly carried out for over 25 years. This late confession was not accompanied by the production of tangible and irrefutable elements making it possible to verify these assertions, and therefore did not convince all the ufologists who have looked into the subject. This story received some media coverage, first in the mid-1960s in Spain where the first people contacted who revealed the existence of these letters resided in several press articles and books. The case then received a certain echo in other countries, such as in France when the documents were translated and published in 1984 (cf: Ribera) and is still debated in various websites and forums.

The Ummites would have known of the existence of our civilization following the "accidental" reception in 1948 on Ummo of a message in Morse code sent by a Norwegian ship which, between February 4 and 8, 1934, would have emitted this message when he was heading for Newfoundland. This Norwegian ship which was testing wave radiation in the stratosphere for long distance communications, a train of its waves got lost in space and 15 years later arrived on the planet UMMO. The Ummite scientists detected this signal (we think with error detection codes) and saw that it was not part of the background noise of the galaxy and that it was a coded, intelligent signal. They tried to decode it but they did not succeed, but they located the planet where these wave trains came from. So they decided to organize the first expedition "INAYUYISAA" in Ummite language. « They called the planet from which these waves came OYAAGAA (This word means cold star of the square 2): This is how we call the Earth because the first electromagnetic signals in MORSE received from you reminded the figure of a square 2. OYAGAA:=EARTH ». After a first expedition of reconnaissance of our solar system and the Earth in January 1949, on March 28, 1950 three ships would have deposited six "expeditionaries" in the region of La Javie (French Alps) where their first base would have been installed.

The six OEMII (PEOPLE) who first left for this Planet were : [...] All our valiant expeditionaries had family on UMMO:

OEOE 95 (31 years old terrestrial, expedition leader, BAAYIODUIII specialist (BIOLOGY), 4 children)

UURIO 79 (18 years terrestrial, specialist of human psychobiology, 2 children) ;

INNOO 33 (18 years old on earth, physicist of the matter, one child) ;

ODDIOA 1 (78 years old on Earth, communications specialist, one child) ;

ADAA 66 (22 years old on Earth, sociologist, 2 children) ; ADAA 66, son of ADAA 65, sociologist, 22 Earth years old and the father of two children, was part of UMMO's first expedition to Earth in March 1950. In addition to his work, he also "learned to type" (D1378 letter). During the eighth expeditionary year he died, "victim of an unforeseeable accident" on November 6, 1957 in Yugoslavia. His body could not be recovered. (D57-3 letter)

UORII 19 (32 years old on earth, specialist in pathology of the digestive system, one child).

In memory of ADAA 66, very handsome man from UMMO on the retouched photo.

ADAA 66 is an angel but he died on November 6, 1957 on a planet of the devil 666, a human race created by Satan.

He was not even entitled to a descent burial, it is absolutely despicable that such a pure being, a real gem of evolution ended up like that, it reminds me of Evariste Galois, one of the greatest mathematician of Earth who ended up in the mass grave. We apologize to the family and to the children of ADAA 66. July 2016 : portrait of ADAA (last page). In OYAGAA AYOY YISSAA's tweets (see OAY-Stat 1 and 2) change of avatar and addition of English text under the avatar: «Tribute to ADAA 66 son of ADAA 65 tragically died on Earth in 1957».

«(03/20/67) To make us better understood, it is necessary that you place yourself in the mental framework of an OEMII (men) who had just arrived on an unknown planet of which they did not know, at the level of the means of expression, only a few modulated sounds recorded by our radioelectric detection teams and whose unintelligible jargon did not yet offer serious bases for study. Around six o'clock in the afternoon of this date [March 29], ADAA 66, son of ADAA 65, marauding in the surroundings in the company of another brother and while they tore here and there small branches and leaves to analyze them later, in the unknown shrubs, observed around two large trees, heaped up and blackened stones. The structure of the rock fragments made it possible to identify them as being limestones; ashes scattered around suggested that they had been used for a fire, but that wasn't the most interesting thing. At 1.8 Enmoo (1 ENMOO = 1.9 meters) they located fragments of a yellowish-white lamella, flexible and fragile, crumpled and full of characters or signs obviously written by human beings. Three of them appeared to be stained with feces. A multitude of unknown flying animals took flight (we can think that they were flies and gnats). The find was deemed transcendental and they immediately returned to the gallery ».

La Javie is a small village located in the department of alpes de haute provence, not far from the place of the sadly famous crash of the Germanswing of the airline Lufthansa which had made 150 deaths in 2015. The arrival of the contingent of aliens took place more exactly at 8 km from La Javie between the peaks of Couard and Cucuyon. When they entered the Earth's atmosphere, they would have appreciated the Javid landscapes which would have pushed them to land near the village. Far from the image of small green beings, here, the "invaders" would be taller than the average Nordic type and would have the same body as the Earth human beings with another particularity, namely that they stop speaking from 12 years old, after which communication becomes telepathic. They have a pharyngeal fold in the throat to express themselves with the earthlings. Not without forgetting the purpose of their coming, these beings originating from another planet would have observed our facts and gestures during several years. "They would have mixed with the local inhabitants before leaving for Spain". And it is after having traversed the globe, that the "invaders" decided to transmit their knowledge and their adventure. "In the 60's, the scientists of Ummo started to send by mail the story of their history. "Many people received them", exclaims the expert. Detailing the new technologies used and their positions, they presented La Javie as

their first place of arrival. Their writings will push a large community to believe in their existence and bring curious people to this remote village in the Alps.

The "Ummites" ingeniously mix verifiable assertions with other unverifiable ones which thus benefit from a favorable prejudice. While telling their first descent on Earth, on March 28, 1950, they described very precisely the details of the landing, on an alpine buttress close to the mountain of Cheval Blanc, a few kilometers from the commune of La Javie, near Digne-les-Bains. These details concern the flora, the fauna, the shape of the terrain, and various topographical details, near or far, which should have allowed them to find the place to see that they had not lied. In particular, they gave a detail that could be verified anywhere: The description of a page of the "Figaro" found on the spot. It still took 25 years to think of checking. Better, on the place of their landing, in the gallery which they dug at 8 m of depth, the "Ummites" say that they left a part of their scientific equipment. « As an interesting information we will tell you that the historical gallery still exists, containing inside a part of the original scientific equipment that our brothers took along ». In order to better enable us to find the place of their landing, the "Ummites" gave various topographical information and indications on the visible details of the landscape, such as the cathedral of Digne which, according to them, was similar to a tower.

The Cheval Blanc became the site of a specific quest. There would be a cave, in the mountain, where would be stored scientific instruments. The research continues for the most convinced, who have only one hurry: that they return. The original "Ummite" letter spoke of a cavity dug artificially, on an alpine buttress from where one saw the valley of the Bléone, and the mountain of the white horse. But the ufologists did not base their research on the original texts: they stubbornly looked for what the rumor said: a cave in the foothills of the White Horse Mountain. They even considered using terrier dogs to help them! Aaahh... the White Horse Mountain... Is it the evocative power of this name that led a generation of ufologists astray? Still it is that all the researches were systematically made on the wrong side of the valley. Claude Poher, the head of the rocket section of the CNES (Centre National d'Etude Spatiale) studied the map in 1975. The "Ummites" declared to have landed in a point located at 13 km from Digne and 8 km from La Javie. It is enough for him to use a compass, to find the presumed place: the pass of the Cine, which is indeed located close to the Cheval Blanc. Unfortunately, from this pass, we can't see the cathedral of Digne any more than we can see the Eiffel Tower. But if we draw two circles, centered on Digne and La Javie, we necessarily find two points of intersection. The other is on the side of the "Barre des Adrets", at  $44.208^\circ$  N and  $6.261^\circ$  E. Alas, it is not better off: from this point one can see neither La Javie, nor the Bléone, nor even the Cheval Blanc, and not even the tower of the Cathedral. From the middle of the 70's, some ufologists from Burgundy went to inspect systematically all the high points of the region. A little for the sporting aspect, it must be said. They regularly crossed the team of the C.E.O.F. (Centre d'Etude Ovni France) of Marseille, without either of them finding the famous gallery. It is true that they were always looking on the eastern side of the Bléone. More serious were the searches carried out by Jean-Pierre Petit. His friend Maurice V. even had the excellent idea of climbing the tower of the cathedral, to see which high points of the relief were in direct vision (Since if one sees a summit of the Cathedral, conversely the Cathedral is visible from this summit. We had suggested this method to various ufologists). Disappointment: from up there, he did not see the White Horse Mountain.

Jean-Pierre Petit, sometimes using a microlight, made several expeditions to the high points of the region, comparing the details of the panorama with those described by the "Ummites". First suspect: the summit of Pompe. We saw a cathedral, a Romanesque cathedral as the "Ummites" had indicated, Notre Dame du Bourg. But it was not the right one: it did not have the "strange

tower" described by the Ummites. We have learned that ultra-secret military maneuvers (since the municipal administrations were not even warned on this occasion) took place precisely in the Cheval Blanc mountain and that the curious were ruthlessly dismissed at that time. This proves without a shadow of a doubt that this famous gallery was sought after and was probably discovered with the sophisticated means and other radars that the Army possesses. In other words, the proof that the army has found the famous gallery is that we have heard nothing about it. Jacques Vallée went on an expedition in 1974 with Fernand Lagarde and Aimé Michel (who was from the region). He took with him a drawing of an area of the mountain where the clairvoyant Pat Price thought he had detected a cave. Following the road to its end, they came to a hamlet on the side of the mountain (Chavailles?) They found nothing. "We spoke to the inhabitants of a hamlet on the side of the mountain, where the road ended. They had never heard of any caves in the area". It was only after discovering the deception of San José de Valdérás that the Spanish ufologists of the U3 group, from Barcelona, who were beginning to have serious doubts, mounted an expedition to La Javie. They climbed the Cheval Blanc mountain and were surprised not to see what the "Ummites" had described. It's a bit like a tourist being surprised not to discover the Eiffel Tower in the Parisian landscape that he observes... from the Eiffel Tower. The Spanish ufologists published their conclusions, and titled in their bulletin, "The impostures of Ummo" (las mentiras de Ummo). The "Ummites" could have disclosed the exact coordinates of their landing place, but they kept the secret, and let the ufologists search. It was in their logic.

The Ummites are said they have lived with the population of La Javie in the Alps of Haute Provence for two years in the 1950s. The Ummites mixed with the population for two years in the 1950s with varying degrees of success because during the first expeditions they discovered this dirty race with completely different lifestyles. A theft of an electric meter in a farm named "La dépense" located 4 km from La Javie took place during this period of two years, a sign that the Ummites wanted to learn about the functioning of terrestrial electricity.

This incident of theft of an electric meter is to be related to this passage from letter D57-5: « On the night of April 24, 1950, four of our brothers entered an isolated house in the countryside. [...] The following eight days were entirely devoted by our brothers to analyzing these curious utensils, trying to understand the printed texts and the images of the interior of the apartments. Everything was fascinating. Our brothers had visited these strange whitewashed houses, examining the furniture made of a substance that did not seem to them of vegetable origin. Shining through the windows with a light so bright that it could not be noticed, UURIO 79 son of IYIIA 5, UORII 19 daughter of OBAA 7 and ADAA 66 son of ADAA 65 (who died on Earth in 1957), were the first in history to observe an earthly habitation. The operation was led by ODDIOA 1 son of ISAAO 132.»

Some inhabitants took them for German tourists because of their Nordic appearance but tourists who did not speak the French language. It is afterwards, that they would have learned French/Spanish languages and would have made install a small device in the throat (the pharyngeal fold) to express themselves because the adults cannot speak naturally on the planet UMMO, they are communications at a distance by the spirit (telepathic) it is the result of several million years of evolution which has the double of that of the species SAPIENS SAPIENS. We think that they decided to settle in Spain and send letters to people of Spanish nationality because in the 60s, Spain was considered the most backward country in Europe, as the Ummites themselves say. In order not to attract the wrath of the CIA or other major intelligence agencies and to infiltrate them more easily, it was better to hide in a Western country with a reputation for technical backwardness; this is perfectly logical. The Ummites addressed themselves in the early 60s to lawyers and terrestrial

scientists who did not take them seriously, it is for this reason that they turned to enthusiasts of esotericism and extra-earthly who did not reject them. Proof that Earthly human science is garbage and the men and women lawyers who often intermarry are rottens and sluts who deserve death because they tore up the Ummites' explanatory letters with disdain, don't them not believing when they claimed to come from another planet. In 1966, Mr Fernando SESMA, animator of an "esoteric" Spanish association which met regularly in the basement of a Madrid café "La Balena Alegre" (The merry whale), and who, in a book he had writes, said he was in contact with extra-terrestrials, begins to receive letters, the first known of which begins thus « Men of the Earth, we know that only a few of you foresee the possibility that beings like you and originate from other celestial bodies of this Galaxy, are secretly among you.» These letters are always written in a perfect Spanish language, and idem in a French one but with a few words in the Ummite language. For example, WOA can be literally translated as GOD, and WAAM is a word for the universe. Other recipients will subsequently receive them (as indicated in the introduction, more than 200 mailings are listed, representing more than 1300 pages of text, but mention is made, in a letter of 1988, of 3850 original pages, sent to many recipients in the form of copies representing 160,000 sheets!). Fernando SESMA probably took it as humor when they presented themselves as aliens, but he didn't judge them, answering that he was receiving other aliens: the Pleadians, the Marsians, and many others, SESMA gave a better face of this dirty Earth race. The epistolary contact first continued until 1993, with sometimes long interruptions and seemed to resume in 2003 and 2004 with at least six letters received in France. The Spanish industrialist Raphael Farriols holds the originals of the vast majority of known documents (note that photocopies are nevertheless accessible on the ummo sciences site <http://www.ummo-sciences.org> and a doctor from Seville Ignacio Darnaude lists all the events concerning the "Ummo affair". The ufologists who are interested in this subject consider that among the letters listed some could be "forgeries" which would not be "from the original source" (without prejudging "who" are the editors; humans in the case of a hoax or extra-terrestrials in case the claims of the Ummite documents are true). Among the recipients, we find Jean-Pierre Petit, a French researcher at the CNRS. Nevertheless the originals of certain letters he says he received have never been seen by any of the known specialists in this "Ummo affair", for example a letter called NEF-93 is "signed" by "OAXIIBOO 6 son of IRAA 3" (letter classified H28) while this signature does not correspond, in comparison, with previous letters and the content is not consistent either. In a 1995 scientific article, Petit thanks a certain "Professor Oaxiiboo F" for his help. The debate on the possibility that such letters are "forgeries" that do not originate from the same so-called "Ummite" source remains open.

José Luis Jordán Peña, born on October 13, 1931 in Alicante and died on September 9, 2014 in Madrid, was a Spanish telecommunications technician, known for having confessed to be the author, from 1966 to 1988, of a large number of typed letters, sometimes illustrated with colored pencil sketches, supposedly messages that the inhabitants of a hypothetical planet Ummo would have addressed to the Earthmen. Other "manipulators" would then have taken over after his stroke in 1988. In 1993, Peña's confession put an end to what was called the Ummo affair, for the media and for the authorities.

Peña was first a science teacher in a technical college (in physics and electronics). At the same time, he carried out an intense activity of denunciation to the Franco authorities: "It was there that I met an agent of the Social Brigade whom I met at the "Catholic Faith", an entity of the Society of Jesus directed by Father Sánchez de León. We were dedicated to denouncing to Franco's authorities, protestants, Jehovah's Witnesses, Rotarians, Freemasons..." (letter of 01-04-1997 to R. Farriols). At the beginning of the 1960s, he took some courses in business psychology.

The first "Ummite letters" recorded are those received in 1966 (for a known total of about 265 typed pages received over the year 1966) by several recipients and in particular Fernando Sesma, leader of a Spanish esoteric association, "the Friends of Space", whose members meet regularly in the bar called "La ballena alegre" in Madrid (in spite of their incoherence, these letters were to meet a certain echo in the pro-ovni movement but also with other personalities who, thereafter, were or not recipients of these missives marked with the acronym "UMMO" )+( ).

Peña, who attended the meetings like other students of the time, decided to take action. On January 14, 1966, he called Sesma, introducing himself as Dei-98, an inhabitant of the planet Ummo, to announce that he was sending letters. To give his voice a nasal sound, he made an electric distorter. On January 17, 1970, Peña founded the association "ErIdani AEC", insisting on the general character of the investigations, including parapsychological. It will be dissolved in 1975. There are two "direct observations" where Peña is involved:

1. Aluche (February 6, 1966) On February 6, 1966, in Aluche, Peña affirms to have witnessed the descent and ascent of a UFO. He gave two testimonies, one immediately by telephone to José Luis Pimentel for the magazine *Porqué* and the other almost three weeks later, in writing, at the request of the journalist Eugenio Danyans. He knows that his friend Ortuño was also a witness. Ortuño's testimony is clear and homogeneous, even though it is late (more than two years later). His link with Peña would not be highlighted until several years later by a Spanish journalist (in 1989, Ortuño confessed his friendship with Peña before 1966, and renewed his initial affirmation of the sighting of a UFO in Aluche 23 years earlier, on February 6, 1966, from the window of his apartment on Rafael Finat Avenue). In the place where the extraterrestrial craft was supposed to have landed, three traces of its position on the ground could be observed, which Peña would later confess to making.
2. San José de Valderas (June 1, 1967) Three witnesses declared to have seen a vessel in the sky, they will remain anonymous, but will be interviewed by Peña. Three independent analyses (Claude Poher of the CNES, an American team and a Spanish team) consider that the seven photographs coming from two different films are rigged: whereas they are supposed to have been taken by different witnesses, the analysis shows that they were all taken with the same camera, according to the same angle and from the same distance, and on the same type of film. On the other hand, the conclusions of the Guardia Civil (in 1996) about the negatives of the "Ummite UFO" are not so affirmative. Small plastic tubes marked "Ummo" were also found in the nearby city of Santa Monica. The analysis concludes to a known but not commercialized material.

The arrival of the Ummite nave would have been announced by a letter dated May 27, read on May 30 in a bar in Madrid and signed by many present at this meeting. In 1993, Jordán Peña sent two letters to Raphael Farriols in which he confessed to being the author of these "Ummite documents". Farriols was an important industrialist in Spain from the same esoteric club, who received Ummite letters as did Antonio Ribera, Spanish ufologist writer interested in the UFO phenomenon since the beginning of the 1950s and considered, as such, one of the pioneers of the Spanish ufological research. Raphael Farriols considers that Peña accused himself on the orders of the Ummites. In a letter addressed to Ignacio Darnaude and posted on November 5, 2010, José Luis Jordán Peña provides new information on the UMMO affair. This would be his work, but not entirely: jokers imitating his style are the authors of certain writings and letters. He also specifies that collaborators (for example Vicente Ortuno, Norman West, John Child, M. Carrascosa,

Alberto Borrás, T. Pastrami, Sean O'Connelly, Iker J.) sent letters from distant places and that he created the fictional character of John Axee to better disseminate his knowledge. He reports that he was initially contacted by two American doctors (he previously claimed that they were CIA agents) working for a foreign organization who offered him, for a salary, to carry out a sociological experiment in the interest of of Western culture, which he had accepted.

But in fact, as they confided to SESMA in the late 60's, the experiment of sending the letters was intended to test the reaction of a small group of earthlings to the news of the presence of human beings born on another planet. The Ummites will expand this small group in 1 century (around 2050) to larger and larger groups in number, they say that this is how the officialization of their presence must be done so that the acceptance of the extraterrestrial presence is faced gently, so that the men born on another planet and the other extraterrestrial races that visit the Earth are not considered as repulsive creatures that we must eliminate. The experience is not in the interest of the Western world, but in the interest of the rapprochement between two human civilizations that are very far from each other, in terms of the technology, the evolution and the functioning of society. The jokers could be the Ummites themselves, and the two American doctors had already distinguished themselves in Madrid, presenting themselves as being two Danish doctors.

Antonio Ribera had told Jimmy Guieu in an interview, the famous French ufologist, about the case of the typist living in Madrid, a young man who had left an advertisement in a Madrid newspaper where he said that he made copies by machine. One day he received a visit from two tall blond men posing as Danish doctors who asked him to type scientific texts. One day his wife told him that he had to inform the police because these Danish doctors did not inspire her with confidence, she suspected espionage. A few days later, the first scientific text that the two "Danish" doctors began to dictate to him was: « this is our science, we come from the planet UMMO, which is 14 light years from Earth.» So the Madrid typist remained flabbergasted Seeing his astonishment, the Ummite said to him « don't be surprised we know everything that happened at your home with your wife» and he then took out a small ball from his jacket which remained weightless motionless in the air and a small lighted screen in the ball appeared and the typist saw everything that happened at his home with his wife. And he added: « You see this is a small sample of our technology ».

She was right because they are extra-terrestrial spies, they are benevolent, but they are still spies. The Ummites said to their contact who received the letters in Spain not without humor: « We have stored all the information collected on you, humans from OYAGAA on our titanium memory, it's exciting ». That says it all.

In 2020, the leader OYAGAA AYOY YISSAA of the Ummites said on Twitter in a very cold way: « Your devices, we don't give a damn » and « It would only take 180 expeditionaries to take control any world power country». He adds: « You had understood that we don't give a shit about your gear.» implying that you are inferior to us, but at least you are lucid of yourself. This is related to the adventure of the typist from Madrid who was ridiculed or the adventure of a French Air Force pilot who carried the nuclear bomb on his Mirage 2000 and was ridiculed by a light that could chase him and neutralize him after stalling, this is an example among many others. They do what they want with the Earth race, they can in all tranquility, at least that is what they claim.

This story of a small levitating ball can be related to the UFOs in the form of metallic spheres that have been seen near French nuclear power plants and luminous spheres in the sky that constitute a large number of UFO sightings.

The first lesson we can draw is that if they do exist the Ummites, they live on a star less warm than the sun, they are all blond with blue eyes, rather large, and they look like blond Danish people with blue eyes because be careful, all Danish people are not blond (for example the soccer

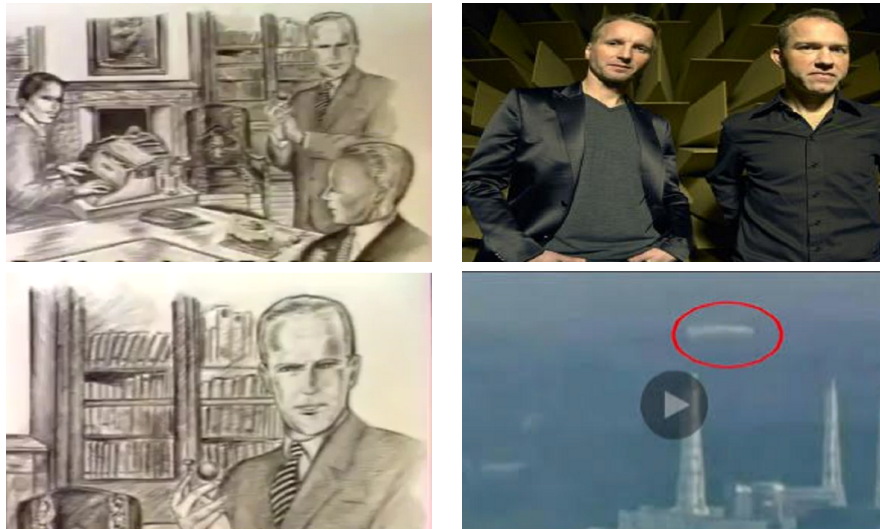


player brothers Laudrup are not blond with blue eyes). So their race is pure and is not honed by solar rays that alter DNA. Their IUMMA star is an orange dwarf. But in addition, they master the anti-gravity, the ball is no longer subject to the force of gravitation, they remain motionless in the air. In the SLIDERS television series, Quinn accidentally opens a wormhole by trying to make an anti-gravity object, to give an illustration with science fiction. And the ball is very small, so their memory capacity is much higher than current computers, they have reached a degree of technological miniaturization unrelated to the Earth technologies of 2020. Then they say in their texts that they produce energy with antimatter, so the nuclear power plants, they don't care. Moreover, they say they intervened in Chernobyl and Fukushima to prevent nuclear disasters that would take place without their help. Without them, Ukraine would have been destroyed by the Chernobyl accident and Japan by the Fukushima disaster. We will develop it further, supporting image. At least it has the merit of being clear, the Earthly human race is nothing at all next to them and in addition they are not the most advanced of them, there is a race that has been visiting us for 10000 years; therefore this filthy Earthly human race is put back in its rightful place.

Between UFOs and nuclear power, it's a long story: unidentified flying objects have been observed in recent decades near civilian and military nuclear facilities. Chernobyl is no exception to the rule and stories as curious as they are dubious have been circulating for years.

During the disaster of April 26, 1986, a UFO would have intervened to prevent an even greater tragedy. An alleged witness Mikail Varitsky recounts: « We saw a ball of fire about eight meters in diameter which moved slowly in the sky. When she got within a few meters of the fourth reactor, she emitted two rays of red light in her direction. It lasted about three minutes. Then, the lights of the object went out and it moved away in a northwest direction ». This miraculous intervention would have lowered the temperature of the reactor and prevented an explosion. The major Russian daily Pravda, mentions it in an article dated September 2002, but again the newspaper does not provide additional information. In this article, Pravda also mentions two later incidents. Three years after the disaster, on September 16, 1989, a female doctor, Dr. Gospina, would have seen an object "which looked like amber" hovering above reactor 4. Again, the mysterious object would have arrived at a critical moment, when a radiation leak had been spotted. Finally, on October 12, 1991, Vladimir Savran, a reporter for the local newspaper the Echo of Chernobyl would have photographed a UFO during a report devoted to the power plant. He would have discovered the object floating above the destroyed reactor only after having developed his pictures. According to Pravda, Vladimir Savran ensures that the object visible in his photos corresponds in all respects to the description of the UFO established by Dr. Gospina.

On the video of the UFO of Fukushima which one can find on Internet, one distinguishes a kind of cigar which oscillates like an earthworm. This long stretched object gives the impression of sucking in the radiation emitted by the reactor badly damaged by the disaster. Japanese authorities said it was a train, a train floating in the air. It's of course a joke orchestrated by the authorities of all countries, it's a global agreement, including Jimmy Guieu 30 years ago had already revealed this agreement aimed at stifling the truth. The flying cigar observed above the Fukushima power plant was probably an intervention of the Ummites, but less discreet than for their action at Chernobyl. The Fukushima disaster should have destroyed Japan, the forces that watch over this filthy Earth race are appearing more and more; the Ummites are playing an active role in it, they have intervened every time the atomic energy in the power plants got out of control.



On the Right: The two blond Danish musicians of the electronic music group Safri Duo have the same physical appearance as the Ummite extra-terrestrials (The two Danish doctors and the typist...) on the Left, reason for choosing the Ummite base in Denmark, Bottom Right: UFO spotted over Fukushima power plant...

It is probable that Farriols was right in spite of the lack of formal proof, it is easy to think that the two American doctors of whom Peña speaks, like the two Danish doctors of the typist betray the Ummites' supertefuge, consisting in working in pairs by being pass for doctors, or CIA agents, whose physical appearance is very close to the Nordic men of Denmark. In fact the Ummites used Peña as a cover by manipulating him into believing that they were CIA agents so that the population remained unaware of the presence of extra-terrestrials and they waited for his death in 2014 to express himself on Twitter in 2015. Peña was the pink post for the Ummites because by confessing to being the author of the letters he extinguished the fire (UMMO), but as they say there is no no smoke without fire. Moreover, the Ummites thanked Peña just after his death in September 2014, telling their contacts that they were losing a FRIEND who knew how to protect the truth. This poor senior Spanish technician would therefore have served as a cover for the Ummites, for them he was a useful pawn in their cause. The poor man who was born a century too early will never see the official announcement of his extra-terrestrial friends which will take place in the 21st century? When? Only the future will tell. either around 2050 as they advised Jean-Pierre Petit, or later. Peña may have had a doubt about their true extraterrestrial origin, he collaborated and he obeyed them either by force or voluntarily. On the other hand, CIA agents who were aware of their physical presence on Earth and of their extraterrestrial origin were brainwashed and put into pre-retirement without killing them. The Ummites put the CIA and their agents to sleep, then posed as US intelligence agents who then became their other main cover for their interlocutors. Antonio Ribeira who died in 2001 and Raphael FARRIOLS who died in 2006 knew that they were extra-terrestrials, but they were very benevolent towards the Ummites, and did not belong to intelligence agencies, nor military, they were not not representatives of the state and obeyed so they did not undergo any Ummite treatment aimed at putting them on the sidelines. The Ummites specified in their letter that we will later see having "kindly".

neutralized CIA agents who wanted to eliminate them or dislodge them from their earthly hideout.

This is our explanation, but again we have no formal proof at this stage. The mystery remained until restricted Ummite accounts appeared in 2015 on Twitter, resistance to change, one might think, or simple adaptation of Ummites to new communication technologies which appeared in the meantime. The ADAA 66 photo (enhanced by artificial intelligence) on the cover of this book confirms the human and Nordic (Vikings) appearance of these alien visitors, which led us to conduct this investigation. Then, we will analyze in detail the documents written by the Ummites and we will make the link with the last discoveries and the scientific and religious history of this dirty human race. Finally I will talk about my life which has been miserable, an absolutely pitiful life that leads me to ask myself why God gave me a life on Earth. What are you doing on Earth? You are not a human being, you have been rejected everywhere and by everyone. At the end of this "biography" illustrating the human misery, I will give my last wishes which are addressed to the last human beings on Earth who will leave the Earth definitively for another habitable planet. First of all, we prove that an angle and a length are the same thing which is a geometric evidence forgotten by Earth Physicists but obviously not by extra-terrestrial physicists, and we describe an interpolation method based on an angular deconvolution for image depixelization, technology that the Ummites claim to master in their last tweets of 2019, although digital imaging experts told us that this technology probably does not exist, after that we give a proof of Fermat Wiles' theorem using the Ummite tetravalent logic which makes it possible to note that the tetravalent logic makes it possible to make too great progress as say the Ummites because the demonstration of Andrew Wiles dating from 1994 making more than 150 pages while ours is less than 10 pages, counting the diagrams. The Ummites had specified to Jean-Pierre Petit that there was a demonstration of Fermat's last theorem using tetravalent logic at the beginning of the 1990s, it is the famous letter from Riyadh. They would have said a few years later you are not going to be forced to use this tetravalent paradigm because that would lead to too much progress.

We give as an indication the bases of the old demonstration which no longer serves any purpose, after having been the object of feverish research for nearly 350 years, only leading to partial results, Fermat's theorem is finally demonstrated by the mathematician Andrew Wiles, after eight years of intense research, including seven in total secrecy. The proof, published in 1995, uses very powerful tools from number theory: Wiles proved a special case of the Shimura-Taniyama-Weil conjecture, which we have known for some time, via the work of Yves Hellegouarch in 1971 (note to CRAS), then from Gerhard Frey, Jean-Pierre Serre and Ken Ribet, that it implied the theorem. The demonstration uses modular forms, Galois representations, Galois cohomology, automorphic representations, a formula of traces ... The presentation of the demonstration by Andrew Wiles was done in two stages:

1. In June 1993, at the conclusion of a three-day conference, he announced that Fermat's great theorem was a corollary of his main exposed results. In the following months, the last version of his proof is submitted to a team of six specialists (three are usually enough) named by Barry Mazur; each must evaluate some of Wiles' work. Among them are Nick Katz and Luc Illusie, whom Katz called in July to help him; the part of the proof for which he is responsible is indeed very complicated: we must succeed in applying Euler's system. Other jurors include Gerd Faltings, Ken Ribet and Richard Taylor. We work in the greatest confidentiality, the atmosphere is tense, the weight of secrecy is heavy to bear. After Katz sent Wiles a few points to clarify, which he quickly clarified, things began to go wrong: Nick Katz and Luc Illusie ended up admitting that we could not establish in the proof, to then apply it, the Euler system, while this element is considered vital to make it work. Peter Sarnak, whom Wiles had taken into the confidence of his discovery before the June conference, then advised him to

seek help from Taylor. Attempts to bridge the gap prove increasingly desperate, however, and Wiles, now in the spotlight, is going through a very difficult time, he is exhausted, he thinks he has failed and resigns himself. It is only nine months later that the denouement will occur.

2. In the autumn, Taylor suggests returning to the line of attack (Flach-Kolyvagin) used three years earlier. Wiles, though convinced it wouldn't work, agrees, but mostly to convince Taylor that she couldn't work. Wiles works there for about two weeks and suddenly (September 19, 1994): « In a flash, I saw that all the things that were preventing it from working were what would make another method (Iwasawa's theory) work that I had worked on before.» While taken separately, Flach-Kolyvagin and Iwasawa were inadequate, together they complement each other. On October 25, 1994, two manuscripts were released: Modular Elliptic Curves and Fermat's Last Theorem (by Andrew Wiles), and The Theoretical Annular Properties of Certain Hecke Functions (by Richard Taylor and Andrew Wiles). The first, very long, announces among other things the proof, relying on the second for a crucial point. The final document was published in 1995.

Then, we will pierce the secrets of the universe always using the tetravalent logic, we will demonstrate thus we explain the reasoning which proves the existence of a twin universe and we give the mathematical formula for the folding of space-time which separates the two twin universes and finally we explain why the curvature of the universe is necessarily negative. After all that, we will explain the big differences between the Ummite civilization and the pitiful Terrestrial civilization by crossing the mass of information of the Ummite mails with the religious, scientific and especially cultural Terrestrial history. Culture is perhaps the only positive aspect of this dirty Earth race, for the rest it is worthless. The Ummites know this.

To finish, I will talk about my life and I will give my last will to disappear, unemployment, exclusion, prison, justice, humiliation, poverty, exclusion, sentimental disappointments, no sexual life, no sentimental life, misery. No living being deserves that, I had to make wrong the GOD generator of the universe. He has not forgiven me.

What is close to my heart: that this planet be vitrified by an extra-terrestrial technology, that the human race of the Earth disappear definitively as well as all the existing forms of life on Earth.

My life is a miserable desert of solitude. The desert of the Mojaves, except that in the desert of the Mojaves, you can have encounters, encounters of the third kind in the basement of the MOJAVE NATIONAL PRESERVE where some Ummites are hiding in the year 2020 according to a tweet of their leader OAY who briefly gave the GPS coordinates of this location in one of the tweets (INFO or INTOX?).

I am waiting for death with a certain liberation, because my life would have been only suffering, I will be dead since a long time when you will be in the obligation to leave this planet for another planet which turns around a less hot star, I know that you will be sad to leave your cradle, and sad to learn that the life should never have appeared on Earth. This scientific and literary testament is addressed to the few terrestrial humans who are preparing to leave the Earth for another habitable planet just before this planet is destroyed for eternity, keep these writings in mind.

It was not until October 1994 that, after many months, Andrew Wiles, with the help of his student, the mathematician Richard Taylor, finally validated his proof. From now on, we will no longer speak of Fermat's conjecture but of Fermat-Wiles' theorem. It is in 1993, hardly one year before Wiles' demonstration, that Jean Pierre Petit receives this letter from Riyadh, the capital of Saudi Arabia, mentioning the existence of a demonstration of Fermat's last theorem using tetravalent logic and more particularly binary inequalities with tetravalent logic which must be crossed with

the equalities  $0=1$  and  $1=0$ . It is a two-page letter in French, published in Jean-Pierre Petit's book "Le mystère des Ummites". Some missing spaces after commas have been kept as in the original. Note also that at least two Ummite words have been spelled with Spanish phonetics in a text written in French. Problem concerning the signature, as in FP03 (claimed Proplyd letter received by J-P Petit), NR-12 (letter to Aguirre) and FP04 (claimed NEF 93 received by J-P Petit); see J. Pollion's study of the signatures.

On 19/01/2019 some members of GR1 published this information on twitter regarding the destroyed part of GR1-10: "The members of the GR1 microgroup who, upon its receipt had access to the undisclosed - and deleted - part of the GR1-10 letter, state:

- That we had undertaken, before reading it, not to reveal its contents.
- That after the new indications given by our communicators in OAY-92, we feel partially released from such a commitment.

By virtue of this new situation, we announce that, in this undisclosed part of GR1-10, the falsity of all the letters received by JP Petit has been confirmed, except for the so-called Riyadh letter of 1992, concerning the solution of Fermat's theorem, with nonsense  $0=1$ ,  $0\neq 0$ ,  $1\neq 1$ , etc., which have nothing to do with tetravalent logic."

According to GR1-10 therefore, this letter would be from the source, but containing nonsense no doubt to test the reader's insight. We therefore recommend caution to readers. The LNC voting group was again consulted in February 2019 and voted to keep this letter classified as NR (6 votes for NR, 1 vote in H, 1 vote in FP, 6 abstentions). In front of the incredulity, members of ummo-sciences and of the GR1 group that received the last Ummite letters, we can answer this.

Why mention this tetravalent demonstration when Wiles demonstrated less than a year after Fermat's last theorem, if the Ummites had wanted to make disinformation, it would have been nipped in the bud. This is completely absurd, especially since this letter was sent to only one recipient, and it did not get out. So, it was not disinformation, but rather the proof that the Ummites wanted to give a trick to prove a historical theorem with a sophisticated but new intellectual gymnastics that requires less work in number theory.

## 8 Mathematical formula of the space-time folding that separates the two universes and link with the curvature of the universe: the power of hyperbolic geometry.

When I was a teenager around the age of 15 (in high school), I developed a theory called  $\alpha$  THEORY which exposes a new vision of gravitation, in particular around "black holes", at the time in 2003, I was unaware of the existence of Ummites and their mail so I used the term "black hole". I was trying to model the gravitational force with an angle. What does this theory lead to? It leads to a biunivocal formula where the gravity  $G$  (in  $m/s^2$ ) is a function of the angle  $\alpha$  (local angle of inclination of the space-time) which can be expressed in 2 different units:

-in degrees with  $G(\alpha)=10^7(1/\alpha-1/180^\circ)$ ;

-in radians with  $G(\alpha)=10^7(1/\alpha-1/\pi)$ ;

I prefer to use the second function in my calculations because it conforms to the SI unit of measurement with angles (in radians, corresponding to meters), lengths in meters and durations in seconds with  $G$  in  $m/s^2$ .

What is it modeled by? It is modeled by 5 photos which correspond to 5 values of  $\alpha$ , equally distributed on a semicircle, i.e. every  $45^\circ$ . An additional photo models a particular case: the border effect between the two twin universes. In the original 2003 document, it was named PHOTO  $\alpha_{BLACKHOLE}$  or  $\alpha_{BORDER}$ . In these photos a simple sheet of paper represents the space-time of our universe on one side and the space-time of the twin universe on the other. I fold this sheet of paper in its middle so as to obtain angles between 0 and  $\pi$ . This local angle of inclination of the sheet is used to show the shortcut between two points of the space-time. The pencil is used to show the connection between these two points. The pencil is a bridge whose ends represent the curvature of space-time.

- if  $\alpha < 43^\circ$  the entrance of the bridge absorbs matter and light to transfer it towards a symmetrical region of the twin universe compared to the border of the two twin universes
- if  $\alpha \geq 43^\circ$ , the bridge is virtual and does not absorb matter or light.

In this last case, there remains only the usual gravitational attraction on the matter (for example the terrestrial attraction) and the deflection of the light.

Thanks to this illustration, we can see that, when gravity is very weak, the shortest path between A and B is the straight line. But when gravity increases, space is bent at an angle of inclination and the path between A and B becomes shorter through the twin universe in space and in time since time and space are intimately linked. A and B are two points of our universe?

The function  $G(\alpha)$  expresses the local value of local gravity  $G$  as a function of the local tilt angle of space-time. Attention  $G$  is not here the gravitation constant, it is the local gravity in the vicinity of a star as a function of the deformation angle of the space-time. For example,  $G=g=9.81 m/s^2$  and  $\alpha=179.99^\circ$ ...for Earth (cold star of the square). This function must respect the following boundary conditions:

- for  $\alpha=0$  radians  
 $G(\alpha=0)=+\infty m/s^2$  so  $G=a(1/\alpha+b)$

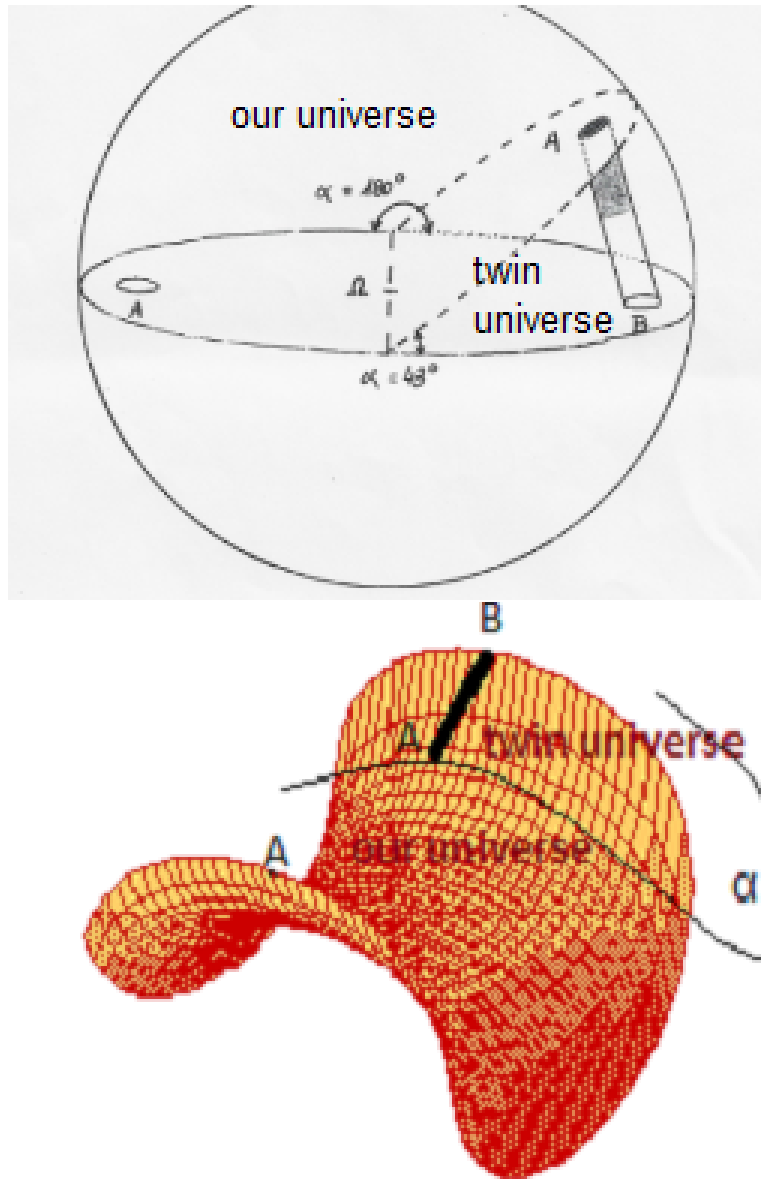


FIGURE 71: Illustration of the shortening of the distance between points A and B

- for  $\alpha=\pi$  radians  
 $G(\alpha=\pi)=0 \text{ m/s}^2$  so  $G=a(1/\alpha-1/\pi)$  with  $b=-1/\pi$
- for  $\alpha_{BORDER}$   
 $G(\alpha_{BORDER})=10^7 \text{ m/s}^2$   
 therefore we have  $a=10^7 \text{ m/s}^2$  and we have:

$$G(\alpha)=10^7 (1/\alpha-1/\pi) \quad (1)$$

$\alpha_{BORDER}$  is the angle of inclination of the local space-time of a gravitation from which it starts to form a border effect between the two twin universes (formerly called black hole by error).

Why  $10^7 \text{ m/s}^2$ ? In my equations, I use  $10^7$  as an order of magnitude in my function. We get it by doing the following calculation Gravity (G) is proportional to the mass (M) present in a place of the universe.

The gravity at the surface of the Earth is  $9.81 \text{ m/s}^2$ .

Moreover the mass of the sun is 333 000 times the mass of the Earth.

Finally to create a border effect between the two universes, it takes a mass equivalent to twice the mass of the sun, which corresponds to a gravity of  $2 \times 9.81 \times 3.33 \times 10^5 \approx 10^7 \text{ m/s}^2$ .

Thus to create a boundary effect, we need  $G=10^7 \text{ m/s}^2$ , if:  $(1/\alpha-1/\pi)=1$

$$1/\alpha=1/\pi+1$$

$$\alpha=\pi/(\pi+1)\approx 0.758 \text{ radian}$$

or, if  $\alpha$  is expressed in degrees,  $\alpha=(180/\pi) \times 0.758$ , i.e.  $\alpha_{BORDER}=43^\circ$  (see FIGURE 1A).

Studies of several particular cases with calculations

The value of the function G for  $\alpha=0^\circ$ :  $G(\alpha=0^\circ)=+\infty \text{ m/s}^2$  means that the case in the FIGURE 71A is impossible. Infinity is a mathematical notion and not a physical one. In physics infinity has no meaning. The distance between the points A and B is null, this case is unrealizable, it would correspond to an instantaneous travel between two planets separated of 14,4 light-years.

$$\text{if } \alpha=45^\circ=\pi/4 \text{ radians, } G=10^7(4/\pi-1/\pi)=(3/\pi).10^7 \text{ m/s}^2.$$

$$\text{if } \alpha=90^\circ=\pi/2 \text{ radians, } G=10^7(2/\pi-1/\pi)=(1/\pi).10^7 \text{ m/s}^2.$$

$$\text{if } \alpha=135^\circ=3\pi/4 \text{ radians, } G=10^7(4/3\pi-1/\pi)=(1/3\pi).10^7 \text{ m/s}^2.$$

$$\text{if } \alpha=180^\circ=\pi \text{ radians, } G=0 \text{ m/s}^2 \text{ (FIGURE 71B).}$$

The general form of the main equation of the theory is obtained by replacing in (1) the variable  $\alpha$  by a function which satisfies  $f(0)=0$  and  $f(\pi)\neq 0$  which gives:



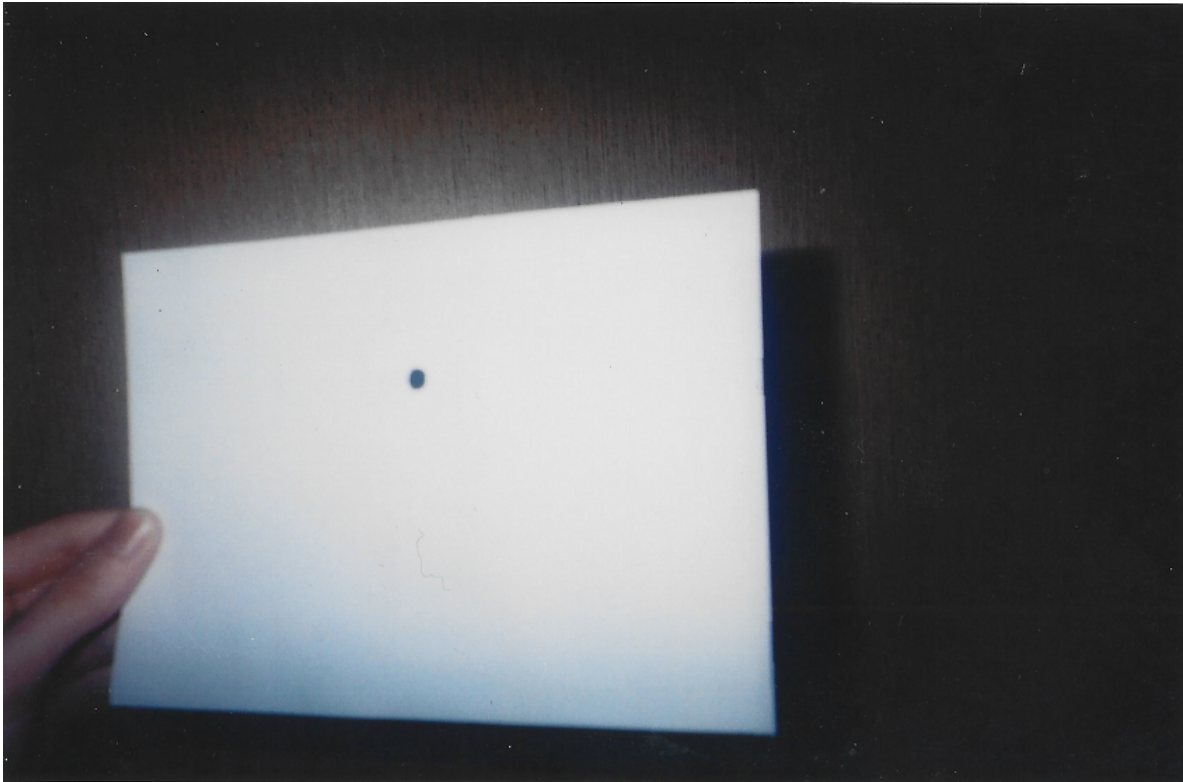


FIGURE 71A: Illustration that represents the case  $G(\alpha=0^\circ)=+\infty \text{ m/s}^2$  (FIGURE 71A).

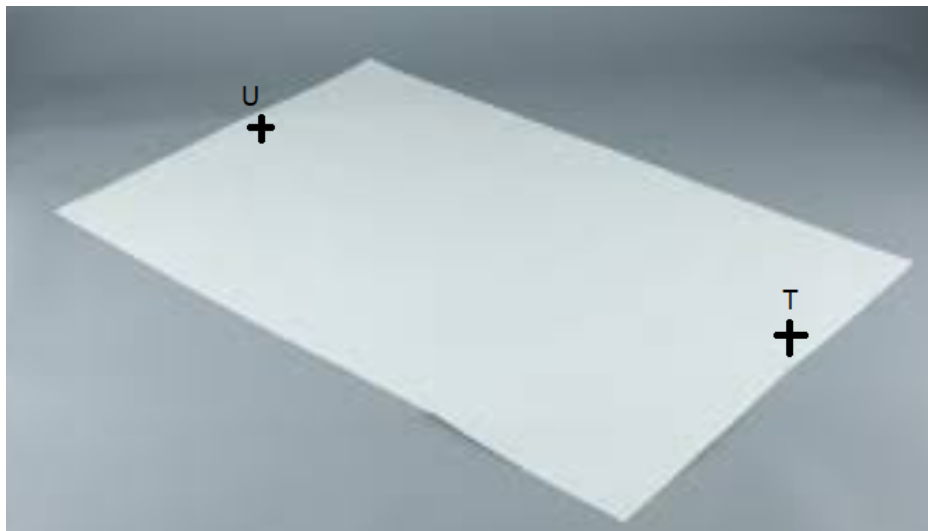
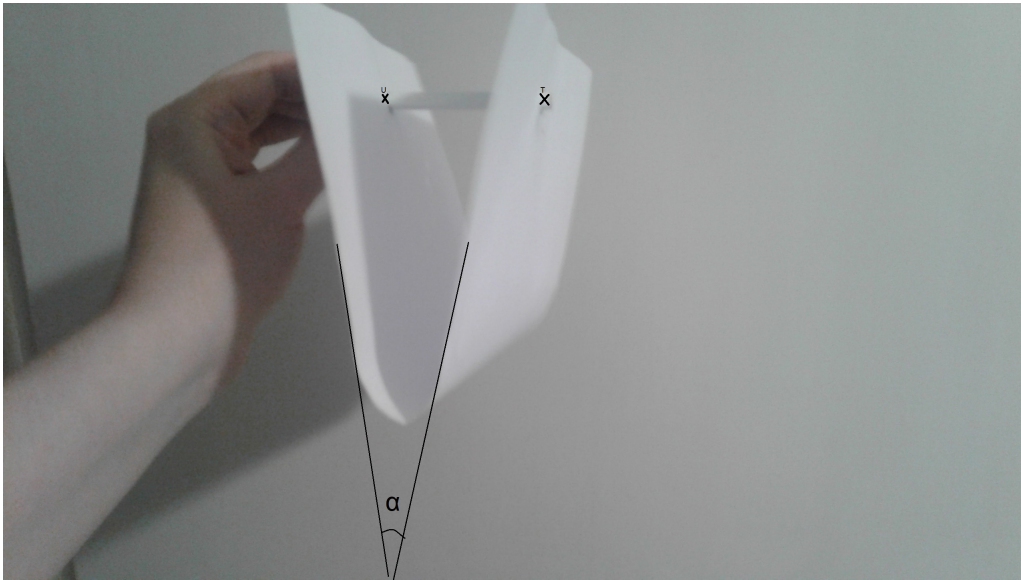


FIGURE 71B: Illustration that represents the case  $G(\alpha=180^\circ)=0 \text{ m/s}^2$  (flat space)

FIGURE 71C: Illustration that represents the case  $G(\alpha) \text{ m/s}^2$ 

$$G(\alpha) = 10^7 (1/f(\alpha) - 1/f(\pi)) \quad (2)$$

The sine function  $f(\alpha) = \sin(\alpha)$  does not work because it cancels in  $\pi$  and is not strictly increasing on the interval  $[0, \pi]$  but the hyperbolic sine function works  $f(\alpha) = \text{sh}(\alpha) = \frac{e^\alpha - e^{-\alpha}}{2}$  with  $f(0) = 0$  and  $f(\pi) \neq 0$ . The hyperbolic sine  $f(\alpha) = \text{sh}(\alpha)$  gives  $\alpha_{\text{BORDER}} = 47^\circ$  whereas as we saw the identity function  $f(\alpha) = \alpha$  gives  $\alpha_{\text{BORDER}} = 43^\circ$ . Moreover  $f$  is a strictly increasing bijection on the interval  $[0, \pi]$  with  $G(\alpha) = 10^7 (1/\text{sh}(\alpha) - 1/\text{sh}(\pi))$ ,  $G'(\alpha) = \frac{-10^7}{\text{th}(\alpha)\text{sh}(\alpha)}$  and  $G''(\alpha) = \frac{10^7}{\text{th}^2(\alpha)\text{sh}(\alpha)}$  where  $\text{th}(\alpha) = \frac{\text{sh}(\alpha)}{\text{ch}(\alpha)}$  is the hyperbolic tangent function.

The sheet of paper that represents space-time adopts the form of variable folds whose main angle of fold oscillates between  $47^\circ$  and an angle of  $5^\circ$ . Obviously, the trip between Umno and Earth is much shorter when the angle is very small around  $5^\circ$ .

If our theory turns out to be correct, it could solve the problem of the limitation of space speeds: it would take tens of thousands of years to cross our galaxy on board a rocket traveling slower than light, like relativity required; but n cutting by my bridge, as shown in photos and equations, ou could go for a walk in the morning on the other side of the milky way and be back for dinner.

But for the moment only nature, with gigantic neutron star collapses, manages to accomplish this kind of feat. Will man ever be able to penetrate through this type of shortcut without relying on a similar gravitational force?

But for Earth scientists, only nature, with black holes, manages to accomplish this kind of feat. Will man one day equal nature? Yes, black holes are boundaries between a positive mass and negative mass environment. How to achieve such an (anti)-gravitation on a human scale? The answer I bring to this question concerns the world of the infinitely small.

Here is my reasoning: In the same way that the television screen transforms electrons into photons, by analogy, it would be necessary to find a device which would transform the electrons into gravitons, then into anti-gravitons to locally increase gravity while inverting it, by reversing the

IBOZOO UU axes of the graviton and the electron (knowing that the graviton and the photon have zero mass). We would therefore obtain an apparatus whose energy source would be electricity. This therefore amounts to including a passage from electromagnetism to gravitation. What is possible with a theory of everything stipulating that the particles classified by quantum physicists differ only by the orientation of their internal axes IBOZOO UUs.

But once arrived at this stage, two problems would arise at the level of the transfer boundary: its density and its structural stability? How to engulf oneself safely in the negative mass environment without suffering the perverse effects on the organism? Perhaps by rotating around a central axis, which would make it possible to define a point through which it would be possible to enter in complete safety... because this point would be devoid of any gravitational force (as in the eye of a cyclone which is devoid of all winds while around them they can swirl at more than 200km/h).

Wouldn't the passage to the negative mass universe lose its structural stability? Wouldn't the Earth be in danger of being swallowed up? No, because the passage would have to be lined with anti-gravity material which would act as a softener for the positive mass/negative mass border. However, precisely in 1996, this phenomenon was demonstrated experimentally. It is called the Casimir effect. This experience is explained as follows: If a strong electric field is imposed between 2 plates separated by a vacuum, the field imposes such a voltage on the vacuum that it forces it to fluctuate until it gives rise to electrons...which amounts to extracting energy from the vacuum... which can only be negative. Could UFOs have something to do with all this? Since the cosmic distances in our universe are gigantic, my space-time shortcuts be used by any advanced civilization. This hypothesis is also confirmed by the findings of Professor Bounias because anti-gravity reverses the mass and the direction of time (remember that mass is a sum of angles, one of which is time), which reverses the metabolism of the plant as we have seen previously. Moreover the videos confirm that the UFOs make brutal accelerations without making noise, only the anti-gravity can do that because the source of energy is internal to the angular structure of the subatomic particles.

We knew before, according to general relativity, that gravity change space-time. The new  $\alpha$  theory shows that, when gravity is increasing, space become so warped that it progressively fold up with an  $\alpha$  angle. The effect of this phenomenon is to make shorter spatial-temporal distance between two points of universe. When gravity is strong enough, two points of universe are joined by a usable shortcut (bridge). Very interesting results can be deduced of the  $\alpha$  theory.

The variable folds of space (see FIGURE 24.24A) which allow the shortening of the distances in fact of the oscillations of the sheet of paper between  $10^\circ$  and  $43^\circ$ , the conditions of travel are favorable when one is around an angle by  $10^\circ$  (you replace the rounding of the sheet by the corresponding angular extension  $\alpha$ ).

Anti-gravity is the idea of creating a space or object that is free of gravity. It is not a matter of counteracting gravitation by an opposite force of a different nature, such as a balloon inflated with helium; the antigravity represents, rather, either the disappearance or inhibition, or the inversion, or the reduction of the fundamental causes of the gravitational force with respect to the space or object in question, by any technological means.

Antigravity is a recurring concept in science fiction, particularly in the field of spacecraft propulsion. The concept was initially formalized as favorite in *The First Men in the Moon* of H. G. Wells. It has since become a favorite theme of imaginary technology. The term antigravity can also sometimes be used for a hypothetical non-reactive propulsion based on certain solutions of general relativity. Another route considered would be to reduce the spatio-temporal curvature of a gravitational medium, in which case the gravity of the space thus modified would only be attenuated.

In the physical sciences, many more recent theories complement general relativity, even replace it

radically (quantum gravity, string theory, etc.), in order to resolve some apparent inconsistencies, whether with regard to quantum physics and its standard model, considered irreconcilable with relativity, or with regard to astronomical observations such as the expansion of the Universe — which requires the introduction of a hypothetical and undetectable dark energy — or the maintenance of certain galaxies around their clusters — which requires the introduction of an equally hypothetical and undetectable dark matter, also baryonic asymmetry particles/anti-particles. Some of these alternative theories allow solutions of the antigravity type, which would solve several of these inconsistencies; moreover, formally, the equations of general relativity themselves do not rule out the possibility of negative and therefore repulsive mass. The CNRS plans to test in 2018 a hypothesis on the antigravity character of antiparticles.

However, according to widely accepted physical theories in 2018, verified through experiments, and according to the preminent directions of physics research, antigravity remains currently considered unlikely.

Thus, at the beginning of 2022, CERN results seem to show that the ratios between electric charge and mass (charge to mass ratio), for proton and antiproton, are identical within an experimental uncertainty of 16 millionths of a millionth.

In the first precise description of gravitation, on mathematical bases, Newton's gravity was an external force transmitted by unknown means. However, at the beginning of the 20th century, the Newton model was replaced by a more comprehensive and general description known as general relativity. In this approach, gravitation is no longer a force, in the traditional sense of the term, but is the manifestation of the geometry of space-time itself. These geometric solutions are always calculated based on a convex spatial-temporal curvature (downward curvature and upward arrow of time). In these curves, all time axes (perpendicular to space) converge (in the direction of the arrow of time).

Therefore, regardless of the positive curvature (e.g. ellipsoid, elliptical paraboloid) or negative (e.g. hyperboloid to a tablecloth, hyperbolic paraboloid) the results always give an attractive force.

However, for a concave curvature, as is the case for the curvature of the universe and unlike a gravitational field, the temporal axes diverge.

Among the various theories, the expansion of the universe would then be only an effect of its concave curvature subjected to the sense of time and therefore the effect of the antigravitational field that the universe would be.

It should also be noted that with general relativity, the perimeter around a gravitational field is less than 2 times its radius. By contrast, if this existed, the perimeter around an anti-gravitational field would be greater than 2 times its radius. But no such field has been studied, much less observed. Under the current acceptance of general relativity, antigravity is unlikely, except in artificial circumstances considered unlikely or impossible.

The theme of antigravity is found in science fiction. The authors invented various ways to levitate objects and people at a lower cost than hovering. For example, in the film *Back to the Future II*, skateboards become hoverboards and hovercraft cars.

An unconfirmed account propagated by some adherents of the theory of the Ancient Astronauts, claims that Francisco Pizarro, facing the Inca emperor, was offered two gold disks capable of antigravity by the effect of vibrations. He would have melted them to destroy what he thought was witchcraft.

Some science fiction stories postulate the existence of a substance partially or completely opaque to gravity. Placing this substance below an object would reduce or eliminate its weight, placing the object in levitation with a relatively low energy expenditure. In Newtonian physics, where gravity

is a point-to-point force, this approach is permissible: the gravitational field would be inhibited by a shield in the same way that the magnetic field is inhibited by diamagnetic substances.

There are serious reasons to believe that such substances do not exist. Imagine the results if you put a substance like this under half a falling wheel. One side of the wheel under the substance would have no weight, while the other would suffer gravity. This movement could be exploited to produce energy from nothing, which is a very clear violation of the first principle of thermodynamics. More generally, this follows from Gaussian laws, which indicate that the inverse square of a static field (such as the Earth's gravitational field) cannot be blocked (magnetism is static, but at the inverse cube).

Antigraviton is the particle of antimatter associated with graviton, a boson vector of gravitational force in quantum mechanics. In this theory, since an uncharged, non-mass particle is its own antiparticle, the antigraviton is graviton.

In the context of general relativity theory, where gravity does not derive from a field but from the very structure of space-time, the whole concept of graviton (and thus of antigraviton) is illogism. The theory of general relativity was introduced in the 1910s, but its development was slowed considerably by the lack of suitable mathematical tools. Some of them appeared in the 1950's, and in the 1960's a flourishing period for this theory, later dubbed the golden age of general relativity. Although it appeared that the antigravity did not respect the laws of general relativity, many studies nevertheless sought solutions capable of producing antigravity-type effects.

It is claimed that the Air Force itself conducted studies in the 1950s and 60s. Former Lieutenant Colonel Ansel Talbert published two series of newspaper articles claiming that most of the major aeronautical firms had begun research in the 1950s on the control of gravity propulsion. However, there was little public confirmation of these statements, and since they came during the period of attempts to influence politics through newspaper articles, it is not advisable to give too much credit to such statements.

We know that serious efforts were made by the Glenn L. Martin Company, which established the Research Institute for Advance Study. The major newspapers announced the contract signed between Burkhard Heim and the Glenn L. Martin Company. The founding of the Institute for Field Physics at the University of North Carolina at Chapel Hill in 1956 by Agnew H. Bahnson, director of the Gravity Research Foundation, was another private sector effort to control gravitation.

The military's efforts at antigravity came to an end with the 1973 Mansfield Amendment, which restricted US Department of Defense spending to scientific fields with explicit military applications. The Mansfield Amendment was specifically introduced and voted to end long-term projects with little visible impact.

From 1996 to 2002, NASA funded the Breakthrough Propulsion Physics Program. The program examined a number of advanced space-based thruster designs that did not receive funding through normal university channels or commercial companies. Anti-gravity concepts were discussed under the name of diametric propulsion.

In general relativity, gravity is the result of a local deformation of the geometry of space-time, caused by the local presence of mass-energy. Although the resulting equations are not exploited in the context of negative geometry, it is possible to achieve this by invoking a negative mass. Interestingly, these equations do not in themselves rule out the existence of such a negative mass. Similarly, in quantum physics, the Standard Model of Particle Physics, which describes all the forms of matter known to date, does not allow negative mass. The cosmological dark matter (and possibly dark energy) may be made up of particles outside the scope of the Standard Model and whose nature is still unknown. However, the theory from which they derive implies that their

mass, evidenced indirectly and precisely by their gravitational effects on the surrounding objects, is positive.

Both general relativity and Newtonian gravity are predictive that a negative mass would generate a repulsive gravitational field. In particular, Sir Hermann Bondi proposed in 1957 a form of negative gravitational mass that would accord with the strong equivalence principle of general relativity and with Newton's laws of conservation of energy and movement. Bondi's demonstration led to solutions to general relativity free of any singularity.<sup>11</sup> In July 1988, Robert L. Forward presented a proposal for a Bondi negative gravitational mass propulsion system to the 24th Joint IAA, ASME, SAE and ASEE Propulsion Conference.

Any ground point attracts all other ground points by a force directed along the line (in the geodesic curved direction) connecting the two points. The force is proportional to the product of the two masses and inversely proportional to the square of the distance between the two mass points:  $F_{12} = G \frac{(-m_1) \cdot m_2}{r^2} r_{12} = G \frac{m_1 \cdot m_2}{r^2} r_{21} = -F_{12}$  is the magnitude of the gravitational force between the two mass points,  $G$  is the constant of gravity,  $m_1 > 0$  is the (negative) mass of the first point-mass,  $m_2 > 0$  is the mass of the second mass point,  $r$  is the distance between the two mass points.

The negative mass seems to suffer from the same difficulties as gravitational shields.

Forward stressed that a negative mass would fall towards the normal matter (since the latter causes a gravitational 'depression' around it), while the 'normal' mass would escape the negative matter (the latter causing a gravitational 'slope' around it); Forward noted that under these conditions two similar masses, one positive and the other negative, placed next to each other would then be accelerated, in the direction of the line connecting them, in the direction of the positive mass. Note in passing that since the negative mass acquires a negative kinetic energy, the total energy of the masses under acceleration remains overall zero.

To verify such hypotheses, since the gravitational force is extremely low on simple hadrons, it is necessary to detect and measure it on these particles to reduce considerably their kinetic energy: antiproton retarder is used for this purpose in CERN collider experiments. General relativity postulates that any form of energy (= mass) corresponds to an amount of curvature of space-time, and that the whole generates a specific geometry from which the phenomenon called gravity derives. In this theory gravity is not a force (unlike Newtonian mechanics or quantum theory) and does not involve bosons (graviton or other).

For its part, quantum mechanics and its Standard Model have led on the one hand to the discovery of antimatter, and on the other hand to associate with any force (including gravity) an associated boson. A long-asked question was whether the same equations applied to antimatter. The problem was considered solved in 1957, with the development of CPT symmetry which demonstrated that antimatter follows the same physical laws as normal (i.e. ordinary) matter, and therefore contains positive energy, and also causes (and reacts to) gravity as normal matter. For most of the last quarter of the twentieth century, the physicist community was involved in an attempt to produce a unified theory of fields, a single theory that would explain the four fundamental forces: electromagnetism, strong and weak nuclear forces, and therefore gravity. Scientists have advanced toward unifying the three proven quantum forces, but in each attempt gravity as a force has remained the problem. However, this did not reduce the number of retries.

Generally, these attempts were aimed at quantifying gravity, by assuming the existence of a boson particle, graviton, which 'carries' gravity as well as the photon (of light) carries electromagnetism. However, all attempts to do so have failed, leading to even more complex situations than had been expected. Two of them, supersymmetry and supergravity in relation to relativity, each required the existence of an extremely tenuous fifth force, carried by a graviphoton, which linked together,

in an organized manner, various neglected or unexplored aspects of quantum field theory. As a concomitant consequence, each of these theories did not require that antimatter be affected by this fifth force, in the same way as antigravity, rejecting the repulsion of a mass. Several experiments were conducted in the 1990s to measure this effect, but none produced positive results.

There are solutions to field equations that describe distortions (such as the famous Alcubierre metric or chain control) as well as stable, traversable wormholes. This, in itself, is not significant, since any geometry of space-time is a solution of the field equations for certain configurations of the fields of the energy-pulse tensors (see: exact solutions in general relativity). General relativity does not impose constraints on the geometry of space-time, unless external constraints are imposed on the energy-pulse tensor. Distortion geometry and traversable wormhole geometry are well mastered in most areas, but require regions of exotic material; thus, they are excluded from solutions if the energy-pulse tensor is limited to known forms of matter (including dark matter and dark energy). A new theory uniting the four fundamental forces of physics could claim the reality of antigravitation. A theory long studied by the German physicist Burkhard Heim but never published would unify general relativity and quantum mechanics. This theory has not yet been introduced into conventional science, but is being studied in the US. According to Heim's theory, gravity, electromagnetics, strong interaction, and weak interaction are all part of the same nature: distortion of the space-time continuum in 6 dimensions. In this case, the rotation at very high speed of a magnetic field would deform the space in the opposite way to that of a gravitation and would have the effect of reducing the spatio-temporal curvature of the surrounding gravitation at the rotating field. But Heim's theory is considered a pseudoscience.

Explanation:

On the one hand, according to general relativity, the gravitational force and the acceleration are both a single and same phenomenon that cannot be differentiated without reference. (Centrifugal force is also a phenomenon giving the acceleration effect).

On the other hand, according to special relativity, an object in uniform rectilinear movement sees its length in the direction of movement contract, and the greater its speed, the more its length contracts (be careful, if the lengths contract, a measuring instrument having narrowed measures greater distances). Of course, this becomes noticeable when the speed is sufficiently consistent with the speed of light. As a result, an object in rotation then sees its lengths circularly in the direction of movement shrink and proportionally more and more with respect to the distance from the center of rotation (since for the same angular speed the larger the radius, the greater the linear speed).

In this case we have a saddle-to-horse type spatial curvature (or negative curvature: the perimeter of a circle is greater than  $2\pi R$ ). In summary, general relativity also says that the repulsive force of a centrifuge is due to this type of curvature. Only the curvature applies to the rotating object and not to the surrounding space-time continuum. For this purpose, the use of a magnetic field rotating at very high speed is required. But this too simple solution is not enough (and would already have been invented), because the resulting antigravitational forces are all diametrically opposed to each other and cannot give a common displacement directed in the same direction.

The common antigravitational force is therefore zero. It should be possible to gradually deform the space in the same direction. Do you need several fields rotating one above the other at gradually different speeds or another field perpendicular to the other or another solution? Spatial distortion directed in the same direction and around a center is probably not easy to achieve. But for science, difficult does not mean impossible!

The mass particles would obtain a positive curvature of spherical type by the fact that they would be the result of a sort of spatio-temporal vortex. Contrary to what is explained above, the closer

one gets to the center of the rotation the greater the angular velocity. This results in a siphon effect and the extension of the radius. So the perimeter of a circle is less than  $2\pi R$ , which has the effect of gravitation. A mass particle (or matter) is a kinetic energy in inertia whose motion is that of the spatio-temporal continuum in the form of a pico-vortex.

The electric charge of a particle is either positive or negative depending on the direction of rotation of this spatiotemporal vortex. The annihilation of a particle with its antiparticle would release their own energy, due to this rotation, by space-time waves constituted by light.

In short, everything is the relative geometry of the multidimensional continuum.

Matter, mass, gravitation, gravitational wave, energy, electromagnetic wave, magnetic field, electric charge, strong and weak nuclear interactions, motion, speed, acceleration as well as vacuum are the relative manifestations and effects of multidimensional geometry. Everything is that pure mathematical logic, this is what Einstein thought in his quest for the superforce (theory uniting the 4 fundamental forces of physics) where he published the Unitary Theory of Fields.

Matter as an absolute and discontinuous body does not exist and is not a logical constitution. Discontinuity involves particles with a perfectly spherical boundary going directly from the absolute all (matter) to the absolute nothing (empty). If nothing is created and nothing is lost, nothing can be absolute, everything having been part of the birth of the Universe.

The material is only the result of a continuous geometry in relative motion and has no definite limit but rather has a fuzzy limit gradually passing from the material to the vacuum.

It can be concluded from all this that general relativity does not prohibit the existence or realization of antigravitation.

Anti-gravity devices are a common invention in alternative environments, often requiring a completely new physical framework to function. Most of these devices obviously do not work, and are often part of a broad conspiracy theory. However, there have also been a number of commercial attempts to build such devices and a small number of reports of antigravity-like effects in the scientific literature. By 2007, none of them had gained widespread acceptance in the physics community.

In 1948, a successful businessman, Roger Babson (founder of the University of Babson), created the Gravity Research Foundation to study ways to reduce the effects of gravity.<sup>16</sup> Initially, his efforts were somewhat eccentric, but he occasionally held lectures that attracted people like Clarence Birdseye, inventor of frozen foods, and Igor Sikorsky, creator of the largest helicopter company of the time. Most of the time, his research focused not on controlling gravity but rather on understanding the phenomenon.

The foundation disappeared sometime after Babson's death in 1967, but it continues to offer rewards of up to \$5,000. Since 2007, it has been administered by the City of Wellesley, Massachusetts by George Rideout Junior, son of the foundation's original director. Recent winners include California astrophysicist George F. Smoot, the 2006 Nobel Prize in Physics.

When agitated, gyroscopes produce a force that operates "out of plane" and may appear to lift them against the effect of gravity. Although the illusory nature of this apparent force is well understood, even with Newtonian models, it has nevertheless led to numerous claims for antigravitic devices, and numerous patent grants. None of these aircraft has ever demonstrated operation under controlled conditions, and as a result they have frequently become victims of conspiracy theory. A famous example is Professor Eric Laithwaite of Imperial College London, in his 1974 paper to the Royal Institution.

Perhaps the best example is the series of patents issued to Henry William Wallace, an engineer at GE Aerospace in Valley Forge, Pennsylvania, and GE Re-Entry Systems in Philadelphia.

He constructed fast-rotating disks of brass, a material largely made up of half-integer spin elements.<sup>17</sup>



He claimed that by rapidly rotating a disk of such material, the nuclear spin eventually aligned, and as a result created a gravitometric field in a mode similar to that of the magnetic field generated by the Barnett effect.

Hayasaka and Takeuchi reported weight losses along the axis of a gyroscope in rectilinear rotation.<sup>18</sup> Tests by Nitschke and Wilmathen to verify their claims did not lead to any conclusive results.<sup>19</sup> A few years later, recommendations were issued to conduct further advanced tests.

Viktor Schauburger, the German naturalist, hypothesized in the 1930s that trout can only ascend rivers by using reactive force, present in the linked eddies, also called Karman alleys. This peculiar theory had the effect of attracting Nazi power to Schauburger and enlisted him, as the scientists of the Third Reich were working on the Vril, a process or engine originally intended to operate flying objects by antigravity.

The eddies of the Karman aisles have the particularity of moving by carrying their multiple gyroscopic axes of rotation. The German works that included Schauburger are considered by many to have never existed, and the subject is still being debated today.

In the 1920s, Thomas Townsend Brown, a high-voltage electricity experimenter, produced a device he called the gravitator, which he claimed used an unknown force to produce anti-gravity effects by applying high voltage to materials with a high dielectric constant. Although it was reported that the device operated outside of working weight, Brown abandoned this work and turned successfully to producing the series of high-voltage devices for years to come.

However, the existence of the Biefeld-Brown effect remains. In 1956, an analysis by the Gravity Research Group's partner and a technical author, under the pseudonym Intel, claimed that the Biefeld-Brown effect was the first theory tested by aerospace firms in the 1950s. It remained a constant theme of the UFO field, under the name of lifters. There is a general understanding that lifters require useful mass, aeraulic specificities (Ionic Wind), and do not demonstrate new physical rules.

Russian researcher Eugene Podkletnov claims to have discovered in 1995 during experiments with superconductors that a rapidly rotating superconductor reduces the effects of gravity. Several studies have attempted to replicate Podkletnov's experiment; all gave negative results.

In 1989, Ning Li of the University of Alabama in Huntsville, Alabama theoretically demonstrated how a time-dependent magnetic field could generate detectable gravito-magnetic and gravitoelectric fields on the lattice ion spins of a superconductor. In 1999, Li and her team claimed in the science and DIY journal *Popular Mechanics* that they had built a working prototype generating what they described as "AC Gravity". It was not possible to find out more about this prototype.

The Göde Scientific Foundation's Gravity Research Institute has attempted to replicate experiments believed to produce an antigravity effect. All attempts to observe antigravity effects have been unsuccessful. The Foundation offered a reward of one million euros for a reproducible antigravity experiment.

In 1989, the team of Professor Hayakawa of Tohoku Technological University in Japan, identified an abnormal reduction in the weight of a mass rotating gyroscopically to the right with respect to the vertical axis of the Earth. This discovery has been the subject of a publication.

A 2006 article by Martin Tajmar et al. claims to have succeeded in detecting an artificial gravitational field around a rotating superconductor, proportional to the acceleration of the superconductor. It was followed by an article claiming to explain the phenomenon in terms of a non-zero cosmological constant. Neither the experimental results nor the theoretical explanation have been widely endorsed.

In July 2007, Graham et al. on the Canterbury Ring Laser Group, New Zealand reported the results of an attempt to test the same effect with a larger rotating superconductor. They reported no indication of an effect in the measurement accuracy of the experiment. The Canterbury Group concluded that if such a Tajmar effect exists, it is at least 22 times smaller than predicted in Tajmar's 2006 paper. However, their paper ends with: "Our experimental results do not have the sensitivity required either to confirm or to refute these recent results".

Conventional effects mimicking the effects of are:

- Magnetic levitation suspends an object against gravity using electromagnetic forces. Although visually impressive, this phenomenon takes place while gravity normally works with devices. Various reputed antigravity devices probably actually operate on the basis of electromagnetism.
- Around a massive object like a star or a planet, tidal forces can perturb an object's trajectory, which can appear as repulsive or distorting forces when observed locally. It's not about antigravity. In Newtonian mechanics, the tidal force is the effect of the gravitational forces of the most massive objects, which differs according to the variation of location of the disturbed objects, following different paths in space around the most massive body.
- Large amounts of ordinary matter can be used to produce a gravitational field that offsets the effects of another gravitational field, although the whole thing will still be attracted to the source of the most intense field. Physicist Robert L. Forward proposed using masses of degenerate matter to locally compensate for tidal forces around a neutron star.
- The Ionocraft has been shown as capable of defying gravity, when in fact it uses a type of electrohydrodynamic thruster that uses the Biefeld-Brown effect to hover in the air. So it doesn't work in a vacuum.

The opposite phenomenon is artificial gravity. This consists of reproducing the effects of Earth's gravity where there is none (for example in spaceships) or where it is reduced (for example on the Moon). In several science fiction texts and films and in real-life applications, artificial gravity is created by the use of centrifugal force by rotating a space station or ship on itself or itself. The occupants thus tend to be projected onto the external walls which are arranged as floors.

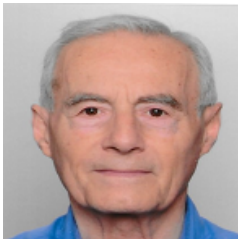
We have solved the mathematical puzzles of the UMMO file. We can affirm that this file is not a hoax and that the Ummites are real intelligent aliens born on another planet.

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Marie-Th r se LABLANCHE  
Thank you Maman for your support.