Space-matter of the Universe

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Abstract: Calculated parameters and characteristics of objects of the Universe are presented in dynamic space-matter. A model of an intergalactic apparatus is presented.

Content

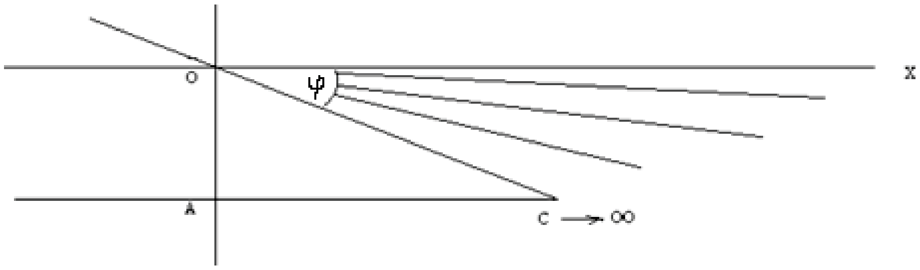
1. Introduction

All theories about the Universe are presented within the framework of Euclidean definitions and postulates.
1. “A point is that, part of which is nothing”) (“Beginnings” of Euclid). or a point is that which has no parts,
2. Line - length without width, and the 5th postulate about parallels that do not intersect.
5. If a line intersecting two lines forms interior one-sided angles less than two lines, then, extended indefinitely, these two lines will meet on the side where the angles are less than two lines.

or

Figure 1 Euclidean axiomatic

That is, through a point outside a line, only one line can be drawn parallel to the line. In the "Unified Theory 2" there are contradictions that are unresolvable in the Euclidean axiomatic. That is, many lines in one line (length without width), again a line. Is it a line or multiple lines? Similarly, the set of points in one point is again a point. Is it a point or multiple points? The Euclidean Elements do not provide answers to such questions. The problems of the 5th postulate are also well known.



There are real facts of the dynamic space of a bunch of straight lines that do not intersect, that is, parallel to the original line AC at infinity, presented in the "Unified Theory 2". And moving along the line (AC), there will be a dynamic space nearby, which we will not be able to get into.

Infinity cannot be stopped, so this already dynamic space always exists. And already the properties of this dynamic $(\varphi \neq const)$space are presented as the properties of matter, the main property of which is movement. There is no matter outside such space, and there is no space without matter. Space-matter is one and the same.

In such a dynamic space-matter, Euclidean axiomatics is presented as a special case of zero $(\varphi = 0)$angle of parallelism. At the same time, the problem of a multitude of exactly straight lines in one straight parallel line is solved, as “length without width”.

The main property of a dynamic space-matter is a dynamic $(\varphi \neq const)$ angle of parallelism. In this case, the Euclidean space in the XYZ axes loses its meaning.

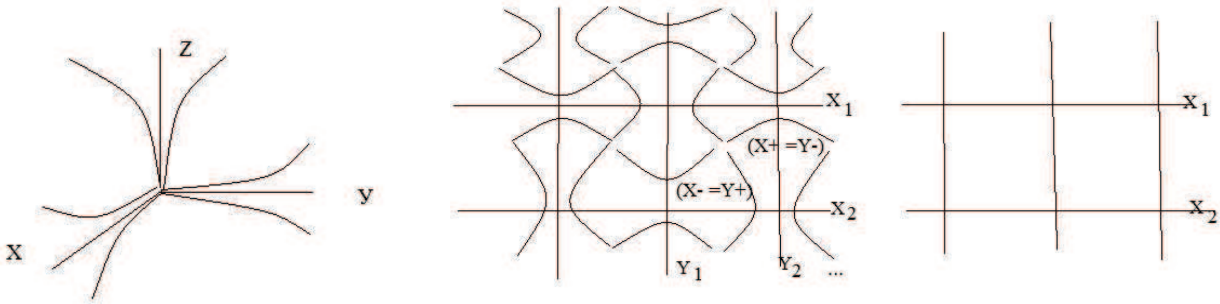


Fig.3 dynamic space-matter

Within the grid of Euclidean $(\varphi = 0)$ axes, we do not see dynamic$(X+= Y-)$, $(X-= Y+)$ space-matter, and we cannot imagine it. Therefore, the axioms of dynamic space-matter are introduced as facts that do not require proof. Already in these axioms the problem of the Euclidean axiomatic of a point is solved, as a set of indivisible points-spheres, in one indivisible point-sphere, but already on (n) convergence, dynamic space-matter.

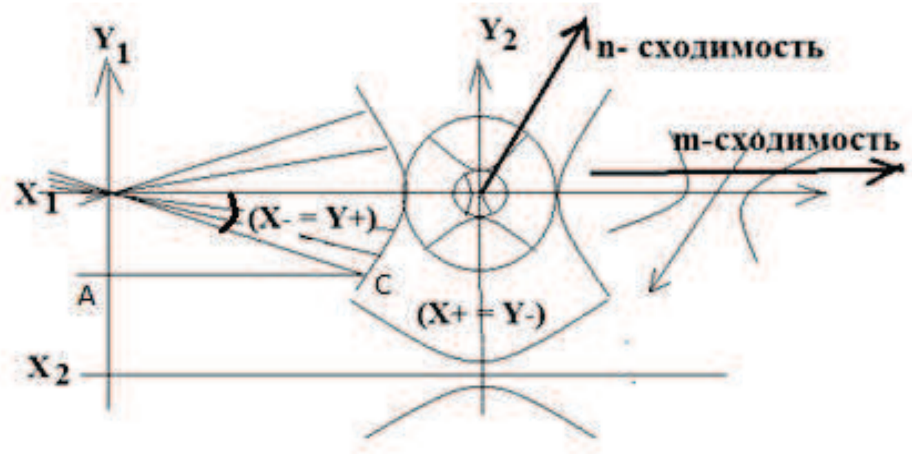


fig.3a - dynamic space-matter

Any fixation (in experiments) of a non-zero $(\varphi \neq 0)$ angle of parallelism gives a multi-sheeted Riemannian space. Now, within the framework of the axioms of dynamic space-matter in the form:

1.Non-zero, dynamic angle of parallelism $(\varphi \neq 0) \neq const$, a beam of parallel lines, determines the orthogonal fields $(X-) \perp (Y-)$ of parallel lines - trajectories, as isotropic properties, of space-matter.

2. Zero angle of parallelism $(\varphi = 0)$, gives "length without width" with zero or non-zero Y_0 - the radius of the sphere-point "without parts" in Euclidean axiomatic.

3. A bundle of parallel lines with zero $(\varphi = 0)$ angle of parallelism, "equally located to all its points", gives a set of straight lines in one "width less" Euclidean straight line.

4. Internal $(X-),(Y-)$ and external $(X+),(Y+)$ fields of lines-trajectories of non-zero $X_0 \neq 0$ or $Y_0 \neq 0$ material sphere-point form the Indivisible Area of Localization $НОЛ(X\pm)$ or $НОЛ(Y\pm)$ dynamic space-matter.

5. In uniform fields $(X- = Y+)$, $(Y- = X+)$ orthogonal lines-trajectories $(X-) \perp (Y-)$ there are no two identical spheres-points and lines-trajectories.

6. The sequence of Indivisible Areas of Localization $(X\pm)$, $(Y\pm)$, $(X\pm)$… along the radius $X_0 \neq 0$ or $Y_0 \neq 0$ sphere-points on one line-trajectory gives n convergence, and m convergence on different trajectories.

7. Each Indivisible Region of Localization of space-matter corresponds to a unit of all its Evolution Criteria - CE, in a single $(X- = Y+)$, $(Y- = X+)$ space-matter on $m-n$ convergences

$$НОЛ = КЭ(X- = Y+)КЭ(Y- = X+) = 1, \qquad НОЛ = КЭ(m)КЭ(n) = 1,$$

in a system of numbers equal by analogy to units.

8. Fixing an angle $(\varphi \neq 0) = const$ or $(\varphi = 0)$ a bunch of straight parallel lines, space-matter, gives the 5-th postulate of Euclid and the axiom of parallelism.

Any point of fixed lines-trajectories is represented by local basis vectors of the Riemannian space:

$$e_i = \frac{\partial X}{\partial x^i} i + \frac{\partial Y}{\partial x^i} j + \frac{\partial Z}{\partial x^i} k, \qquad e^i = \frac{\partial x^i}{\partial X} i + \frac{\partial x^i}{\partial Y} j + \frac{\partial x^i}{\partial Z} k,$$

with fundamental tensor $e_i(x^n) * e_k(x^n) = g_{ik}(x^n)$ and topology $(x^n = X, Y, Z)$ in Euclidean space. That is, the Riemannian space is a fixed state of dynamic space-matter. Local basis vectors correspond to the space of velocities WN=K+NT-N, in multidimensional space-time.

Space-time is a particular case of a fixed $(\varphi \neq 0) = const)$ state of dynamic $(\varphi \neq const)$ space-matter. At the same time, all the Criteria of the Evolution of matter are formed in the multidimensional $W^N=K^{+N}T^{-N}$ space-time. They are presented in the "Unified Theory 2" in the form: $(П=W^2)$ - potential, $(F=П^2)$ - force....

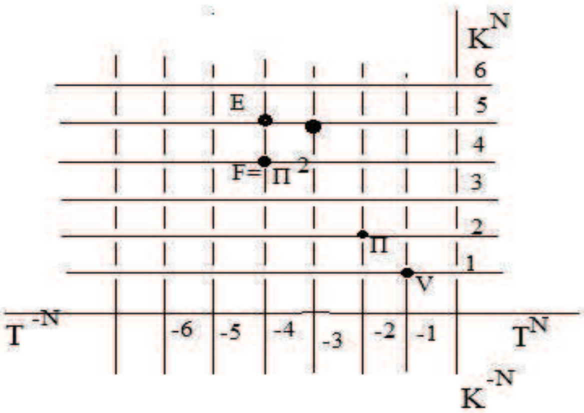


Fig.4 uniform Criteria of Evolution of space-matter.

In physical theories, we are talking about electro $(Y+=X-)$magnetic fields of charge: $q(Y+=X-)=\Pi K$, and gravite $(G+=Y-)$ mass fields with mass: $m(G+=Y-)=\Pi K$, and the corresponding equations of dynamics (which are derived) as mathematical truths. These are Maxwell's equations

$c*rot_Y B(X-)=rot_Y \mathrm{H}(X-)=\varepsilon_1\frac{\partial E(Y+)}{\partial T}+\lambda E(Y+)$ $rot_X E(Y+)=-\mu_1\frac{\partial \mathrm{H}(X-)}{\partial T}=-\frac{\partial \mathrm{B}(X-)}{\partial T};$	$c*rot_Y M(Y-)=rot_Y N(Y-)=\varepsilon_2*\frac{\partial G(\mathrm{X}+)}{\partial T}+\lambda*G(\mathrm{X}+)$ $\mathrm{M(Y-)}=\mu_2*N(Y-);\quad rot_y G(\mathrm{X}+)=-\mu_2*\frac{\partial N(Y-)}{\partial T}=-\frac{\partial M(Y-)}{\partial T};$

and equations of dynamics of gravitational-mass fields.

Indivisible Areas of Localization, $(X\pm)$ and $(Y\pm)$, as facts of reality, we correlate with indivisible quanta $(X\pm=p)$ of a proton, $(Y\pm=e)$of an electron, $(X\pm=\nu_\mu)$, $(Y\pm=\gamma_0)$, $(X\pm=\nu_e)$, $(Y\pm=\gamma=c)$ photon. These quanta form the first Localization Area $(OЛ_1)$. And like Cartesian, spherical, cylindrical, any other coordinate system in Euclidean axiomatic, it is already possible to represent the quantum coordinate system on (m) and (n) convergences, indivisible quanta of space-matter, in full.

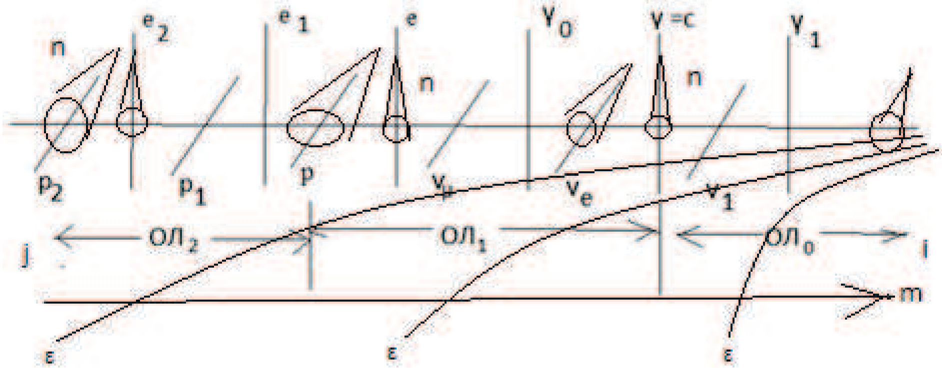


Fig.5 quantum coordinate system

Already in such a quantum coordinate system, one can consider the properties of the space-matter of the Universe, visible and invisible for photons and neutrinos of the $(OЛ_1)$ level.

2. Properties of space-matter of the Universe

The visible space of the Universe is represented by a sphere with Euclidean isotropy. In fact, such a Euclidean sphere is expanding, that is, non-stationary. The reason for this non-stationary is considered to be dark energy, in the presence of observable dark masses. Extension conditions are calculated from the conditions of the 2-nd space

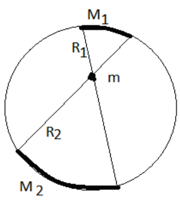


Fig.6. to the conditions of expansion of space-matter

velocity of the masses (M_1) and (M_2), relative to the mass of the observer (m):

$$\frac{mv^2}{2}=\frac{GMm}{R},\quad v^2=\frac{2GM}{R}=\Pi,\quad \text{for}\quad \frac{2GM_1}{R_1^2}=\frac{2GM_2}{R_2^2}\quad \text{or:}\quad \frac{M_1}{M_2}=\frac{R_1^2}{R_2^2},\ R^2\sim(M=\rho V).$$

As a result of transformations: $v^2=\frac{2G(\rho V)}{R}=\frac{2G\rho 4\pi R^3}{3R}=\frac{8\pi G\rho R^3}{3R}$, or: $(\frac{v}{R}=H)^2=\frac{8\pi G\rho}{3}$, we get:

$\rho_{\kappa} = \frac{3H^2}{8\pi G} \approx 10^{-29} \left[\frac{г}{см^3}\right]$, critical density of irreversible expansion. (H) is the Hubble constant.

We are talking about the visible expansion, fixed $(Y \pm = \gamma = c)$ by photons $(ОЛ_1)$ of the level of indivisible quanta of space-matter $(p,\ e, \nu_{\mu},\ \gamma_{0,}\ \nu_e, \gamma)$ in the quantum system coordinates. Now let's represent the indivisible quanta of space-matter, in the form $ОЛ_{ji}(m)$ of their (m) convergence.

$$ОЛ_j \dots ОЛ_3 \dots (p_3\ e_3\ p_2\, e_2\, p_1\, e_1\ = ОЛ_2)(p, e, \nu_{\mu},\ \gamma_{0,}\ \nu_e, \gamma = ОЛ_1)(\nu_1\gamma_1\, \nu_2\gamma_2\, \nu_3\gamma_3\ = ОЛ_0) \dots ОЛ_{-1}ОЛ_{-2} \dots ОЛ_i$$

In this case, the electron speed $(ОЛ_1)$ level: $\left(w = \left(\alpha = \frac{1}{137}\right) * c\right.$, or $\left(w = \alpha^{(N=1)} * c\right.$. Einstein's Theory of Relativity and quantum relativistic dynamics, allow superluminal speeds in space-time.

$$\overline{W_Y} = \frac{c+Nc}{1+c*Nc/c^2} = c, \quad \overline{W_Y} = \frac{a_{11}Nc+c}{a_{22}+Nc/c} = c\ , \qquad \text{for} \qquad a_{11} = a_{22} = 1.$$

Here $(\uparrow a_{11} \downarrow)(\downarrow a_{22} \uparrow) = 1$ are the cosines of the angles of parallelism in the form: $\cos(\varphi_X) * \cos(\varphi_Y) = 1$. Then the sub photon velocities $(\gamma_i\,)$ of the physical vacuum are equal to: $(w_i = \alpha^{(-N=-1,-2\dots)} * c)$ superluminal velocities in $(ОЛ_i)$ levels of the physical vacuum. Similarly, the space of velocities in $(ОЛ_j)$ levels in the form: $(w_j = \alpha^{(+N=1,2,3\dots)} * c)$ provided that $(w_j * w_i = \alpha^{+N}c * \alpha^{+N}c = П = c^2)$ potentials in Einstein's postulates for the $(ОЛ_1)$ level. In the same potentials, the mass spectrum of indivisible quanta of the entire quantum coordinate system $ОЛ_{ji}(m)$ at (m) convergence is calculated, similarly to the calculations of the masses$(ОЛ_1)$ level:

$$m(X+= Y\ -) = ПК,$$

$$m = \frac{F = П^2}{Y''} = \left[\frac{П^2T^2}{Y} = \frac{П}{(Y/K^2)}\right] = \frac{ПY = m_Y}{\left(\frac{Y^2}{K^2} = \frac{G}{2}\right)}\ , \qquad \text{where} \qquad 2m_Y = Gm_X\ ; \quad \text{and:} \qquad m_Y = Gm_X/2$$

$$m = \frac{F = П^2}{X''} = \left[\frac{П^2T^2}{X} = \frac{П}{(X/K^2)}\right] = \frac{ПX = m_X}{\left(\frac{X^2}{K^2} = \frac{\propto^2}{2}\right)}\ , \qquad \text{where} \qquad 2m_X = \propto^2 m_Y\ ; \quad \text{and:} \qquad m_X = \propto^2 m_Y/2$$

The full calculation of the mass spectrum in: $ОЛ_j$ and: $ОЛ_i$ _i levels of the physical vacuum, is performed by a simple program in TP7, and looks like.

"heavy": $e_j = 2 * p_{j-2}/\alpha^2, \quad p_j = 2 * e_{j-1}/G,$

```
program a1;
uses crt;
const a2=1/(137.036*137.036);
G=6.67e-8; n=12;
Var  p,p1,p2,e1,e,e2:Real;
i,j,m:Integer;
begin clrscr;
p:=938.28; e:=0.511;
 p1:=0.271;
  e:=e; p:=p; p1:=p1;
  for i:=1 to n do
begin
WriteLn('n=',i);
e1:=2*p1/a2;    WriteLn('e1=',e1);
  p2:=2*e/G;  WriteLn('p=', p2);
e2:=2*p/a2; WriteLn('e2=',e2);
p1:=2*e1/G;  WriteLn('p1=',p1);
e:=2*p2/a2;
WriteLn('e=',e);
p:=2*e2/G;
WriteLn('p1=',p);
end ;
 ReadLn;
end.
```

"sub particles": $\nu_i = \alpha^2 * \gamma_{i-2}/2\ ,\ \gamma_i = G * \nu_{i-1}/2$

```
program a1;
uses crt;
const a2=1/(137.036*137.036);
G=6.67e-8; n=12;
Var  p,p1,p2,e1,e,e2:Real;
i,j,m:Integer;
begin clrscr;
p:=938.28; e:=0.511;
 p1:=0.271;
  e:=e; p:=p; p1:=p1;
  for i:=1 to n do
begin
WriteLn('n=',i);
 e1:=G*p/2;    WriteLn('e1=',e1);
 p2:=a2*e/2;  WriteLn('p=', p2);
e2:=G*p1/2;  WriteLn('e2=',e2);
p1:=a2*e1/2; WriteLn('p1=',p1);
e:=G*p2/2;
WriteLn('e=',e);
p:=a2*e2/2;
WriteLn('p1=',p);
end ;
 ReadLn;
end.
```

Each $ОЛ_j$, and $ОЛ_i$ level contains two mass and three charge isopotentials.

Table 1.

Nucleus quanta	$2\alpha * p_j = N * p_{j-}$		$\boldsymbol{p_j = 2e_{j-1}/G}$	$\boldsymbol{e_j = 2p_{j-2}/\alpha^2}$	**N**
			p^{+}_{27}=2,7 E111	e_{27}=1,48 E108	…
Exaquasar	$2\alpha * p^{-}_{26} = 290 p^{+}_{25}$	○	p^{-}_{26}= 7,9 E107	e^{+}_{26}= 9,1 E103	14

	$2\alpha * p^-_{25} = 238 p^+_{24}$		p^-_{25} = 3,96 E103	e_{25} = 2,6 E100	
Superquasar Galaxies of the 1st kind	$2\alpha * p^+_{24} = 25 p^-_{23}$	●	p^+_{24} = 2,4 E99	e^-_{24} = 1,32 E96	13
черных сфер	$2\alpha * p^+_{23} = 290 p^-_{22}$		p^+_{23} = 7,04 E95	e_{23} = 8,1 E91	
superquasars of the 1st kind	$2\alpha * p^-_{22} = 238 p^+_{21}$	○	p^-_{22} = 3,5 E91	e^+_{22} = 2,35 E88	12
	$2\alpha * p^-_{21} = 25 p^+_{20}$		p^-_{21} = 2,16 E87	e_{21} = 1,17 E84	
Superquasar Galaxies of the 2nd kind	$2\alpha * p^+_{20} = 290 p^-_{19}$	●●	p^+_{20} = 6,25 E83	e^-_{20} = 7,2 E79	11
black spheres	$2\alpha * p^+_{19} = 238 p^-_{18}$		p^+_{19} = 3,13 E79	e_{19} = 2,08 E76	
Superquasars of the 2nd kind	$2\alpha * p^-_{18} = 25 p^+_{17}$	○○	p^-_{18} = 1,9 E75	e^+_{18} = 1,04 E72	10
	$2\alpha * p^-_{17} = 290 p^+_{16}$		p^-_{17} = 5,55 E71	e_{17} = 6,38 E67	
Mega star galaxies	$2\alpha * p^+_{16} = 238 p^-_{15}$	●	p^+_{16} = 2,77 E67	e^-_{16} = 1,85 E64	9
black spheres	$2\alpha * p^+_{15} = 25 p^-_{14}$		p^+_{15} = 1,7 E63	e_{15} = 9,26 E59	
Mega stars	$2\alpha * p^-_{14} = 291 p^+_{13}$	○	p^-_{14} = 4,93 E59	e^+_{14} = 5,67 E55	8
super planets	$2\alpha * p^-_{13} = 238 p^+_{12}$		p^-_{13} = 2,46 E55	e_{13} = 1,64 E52	
quasars of the galaxy of the 1st kind	$2\alpha * p^+_{12} = 25 p^-_{11}$	●	p^+_{12} = 1,12 E51	e^-_{12} = 8,22 E47	7
black spheres	$2\alpha * p^+_{11} = 290 p^-_{10}$		p^+_{11} = 4,4 E47	e_{11} = 5,03 E43	
quasars 1 kind	$2\alpha * p^-_{10} = 238 p^+_{9}$	○	p^-_{10} = 2,19 E43	e^+_{10} = 1,46 E40	6
	$2\alpha * p^-_{9} = 25 p^+_{8}$		p^-_{9} = 1,34 E39	e_{9} = 7,3 E35	
quasar galaxies of the 2nd kind	$2\alpha * p^+_{8} = 290 p^-_{7}$	●●	p^+_{8} = 3,88 E35	e^-_{8} = 4,47 E31	5
black spheres	$2\alpha * p^+_{7} = 238 p^-_{6}$		p^+_{7} = 1,94 E31	e_{7} = 1,3 E28	
Quasars of the 2nd kind	$2\alpha * p^-_{6} = 25 p^+_{5}$	○○	p^-_{6} = 1,19 E27	e^+_{6} = 6,48 E23	4
	$2\alpha * p^-_{5} = 290 p^+_{4}$		p^-_{5} = 3,45 E23	e_{5} = 3,97 E19	
Stellar galaxies	$2\alpha * p^+_{4} = 238 p^-_{3}$	●	p^+_{4} = 1,7 E19	e^-_{4} = 1,15 E+16	3
Galactic black spheres	$2\alpha * p^+_{3} = 25 p^-_{2}$		p^+_{3} = 1,057 E15 MeV	e_{3} = 5,755 E11 MeV	
Stars	$2\alpha * p^-_{2} = 290 p^+_{1}$	○	p^-_{2} = 3,05 E11 MeV	e^+_{2} = 3,524 E7 MeV	2
Planets	$2\alpha * p^-_{1} = 238 p^+$		p^-_{1} = 1,532 E7 MeV	e_{1} = 10216 MeV	
ОЛ $_1$ level	$2\alpha * p^+ = 25 \nu^-_{\mu}$	^{238}U	p^+ = 938,28 MeV	e^- = 0,511 MeV	1
	$2\alpha * \nu^+_{\mu} = 292 \nu^-_{e}$		ν^+_{μ} = 0,271 MeV	γ_0 = 3,13*10^{-5} MeV	
			ν^-_{e} = 1,36*10^{-5} M eV	$\gamma^+ = 9.07 * 10^{-9} MeV$	0
			$\nu_i = \alpha^2 \gamma_{i-2} /2$	**$\gamma_i = G \nu_{i-1}/2$**	
physical vacuum ОЛ $_0$ level			ν^-_{1} = 8,3*10^{-10} M eV	γ_1 = 4,5*10^{-13} M eV	
			ν^+_{2} = 2.4*10^{-13} M eV	γ_2 = 2.78*10^{-17} M eV	1
			ν^+_{3} = 1.2*10^{-17} M eV	γ_3 = 8,05*10^{-21} M eV	
physical vacuum			ν^-_{4} = 7.4 *10^{-22} M eV	γ_4 = 4,03*10^{-25} M eV	2

ОЛ $_{-1}$ level			ν_5^- = 2.14*10^{-25} M eV	γ_5 = 2.47*10^{-29} M eV	
			ν_6^+ = 1.07*10^{-29} M eV	γ_6 = 7,13*10^{-33} M eV	3
physical vacuum ОЛ $_{-2}$ level …………….			ν_7^+ = 6.57*10^{-34} M eV	γ_7 = 3,58*10^{-37} M eV	
			ν_8^- = 1.9*10^{-37} M eV	γ_8 = 2.2*10^{-41} M eV	4
			ν_9^- = 9.53*10^{-42} M eV ……………………	γ_9 = 6.35*10^{-45} M eV …………………..	….

3. Parameters of the space-matter of the Universe in the quantum coordinate system.

Let us consider the properties of the classical representations of the Criteria for the Evolution of Matter. In the presented table of masses of indivisible (stable) quanta $(Y\pm)$ and $(X\pm)$ of space-matter, we are talking about the inert $m(Y-)$ mass, for example, $\gamma(Y-)$ of a photon, and the gravitational mass $m(X+)$ e.g. $p(X+)$ proton or $\nu_e(X+)$ neutrino. We are talking about: $p(X-) = e(Y+)$, $\nu_\mu(X-) = \gamma_0(Y+)$, $\nu_e(X-) = \gamma(Y+)$ three charge and two: $(m = ПК)$ mass $e(Y-) = \nu_\mu(X+)$, $\gamma_0(Y-) = \nu_e(X+)$ isopotentials in each $ОЛ_j$, and $ОЛ_i$ level of physical vacuum. We are talking about the energy $E = (П_1П_2 * K)$ of the interaction of the potentials of two points at a distance(K) , with a force$(F = П^2 = П_1П_2)$. The potential itself is: $П = (K * b)$, this is the acceleration (b) at a distance (K). Energy $E = mc^2$, or $E = \hbar\nu$, where $m = \nu^2 * V$, and so on.

In classical relativistic dynamics: $R^2 - c^2t^2 = \frac{c^4}{b^2} = \overline{R}^2 - c^2\overline{t}^2$, space-time space-time itself experiences acceleration:$b^2(R\uparrow)^2 - b^2c^2(t\uparrow)^2 = (c^4 = F)$. In the same Criteria,$\left(b = \frac{K}{T^2}\right)(R = K) = \frac{K^2}{T^2} = П$, we are talking about the potential in the velocity space $(\frac{K}{T} = \overrightarrow{e})$ of a vector space in any $\vec{e}(x^n)$ coordinate system, where $П = g_{ik}(x^n)$ is the fundamental tensor of the Riemannian space. Then in general we have:

$$П_1^2 - П_2^2 = (П_1(X+) - П_2(Y-))(П_1(X-) + П_2 * (Y+)) = (\Delta П_1(X+= Y-))\downarrow(\Delta П_2(X-= Y+))\uparrow= F$$

This force on the entire radius $(R = K)$ of the visible sphere of a single $(X\pm= Y\mp)$ space-matter of the Universe, gives (dark) energy $(U = FK)$ to the dynamics of the Universe, in gravity $(X+= Y-)$ mass and in electro$(Y+ = X-)$magnetic fields. Therefore, this is the energy of the relativistic dynamics of the Universe.

$$(П_1^2 - П_2^2)K = (П_1 - П_2)K(П_1 + П_2) = (\Delta П_1)(X+= Y-)\downarrow K(\Delta П_2)(X-= Y+)\uparrow= FK = U$$

What is its nature? On the radius $(R = K)$ of the dynamic sphere of the Universe there is a simultaneous dynamics of a single $(X\pm= Y\mp)$ space-matter. Considering the dynamics of potentials in gravitational mass $(X+= Y-)$ fields, as already known, $(П_1 - П_2) = g_{ik}(1) - g_{ik}(2) \neq 0$, we are talking about the "gravity" equation $R_{ik} - \frac{1}{2}Rg_{ik} - \frac{1}{2}g_{ik} = kT_{ik}$ of the General Theory of Relativity, in any system $(x^m \neq const)$ of coordinates, and in various $ОЛ_j$, and $ОЛ_i$ levels of the physical vacuum of the entire Universe. The gradient of such a $(\Delta П_1)$ potential is also known to give quantum gravity equations with inductive $M(Y-)$ (hidden) mass fields in the gravitational field. We are talking about $(\Delta П_1 \sim T_{ik})\downarrow(X+= Y-)$ energy-momentum $T_{ik} = \left(\frac{E=П^2K}{p=П^2T}\right)_i\left(\frac{E=П^2K}{p=П^2T}\right)_k = \frac{K^2}{T^2} \equiv (П)$, gravity $(X+= Y-)$ of the mass fields of the entire Universe, with a decrease in the density of mass $(Y-)$ trajectories on the Planck scale.

$$ПK = \frac{(K_i\to\infty)^3}{(T_i\to\infty)^2} = \left(\frac{1}{(T_i\to\infty)^2} = (\rho_i \to 0)\downarrow\right)(K_i{}^3 = V_i\uparrow)(X+= Y-) = (\rho_i\downarrow V_i\uparrow)(X+= Y-),$$

$$(R_j) * (R_i = 1{,}616 * 10^{-33}sm) = 1, \qquad (R_j) = 6{,}2 * 10^{32}sm \qquad (\rho_i(Y-) \to 0).$$

In quantum relativistic dynamics, we are talking about the non-stationary Euclidean space of a sphere, which in space-matter has the form of a dynamic ellipsoid. Moreover, the photon comes to the surface from the center of the ellipsoid at the same time. This is due to the dynamics of the speed of light, when: $= \frac{\downarrow\lambda\uparrow}{\downarrow T\uparrow}$, the scale of the period (photon frequency $\uparrow\nu\downarrow= \frac{1}{\downarrow T\uparrow}$ and the wavelength $\downarrow\lambda\uparrow$) change. This is analogous to classical relativistic dynamics, using the example of two observers. A (on the platform) and B (in the car), when simultaneous flashes of light for A in front and behind the car will not be simultaneous for B, who will see blue light in front and red light behind the car. The light wave itself does not change, but the period of interaction for the forward (approaching) wave decreases, and for the back (receding) wave increases, which changes the color of the wave. And the passage of time slows down in the "red" interaction, and accelerates in the "blue" interaction. Similarly, the light at a larger diameter will be "red", with the passage of time slowing down, at a smaller one "blue".

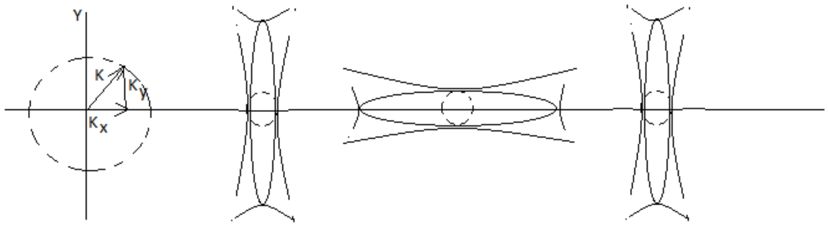


Fig.7. quantum relativistic dynamics

And the same relativistic quantum dynamics $e(Y-)_j \to \gamma(Y-)_i$ in the levels $ОЛ_j$, and $ОЛ_i$ of the physical vacuum of the entire Universe.

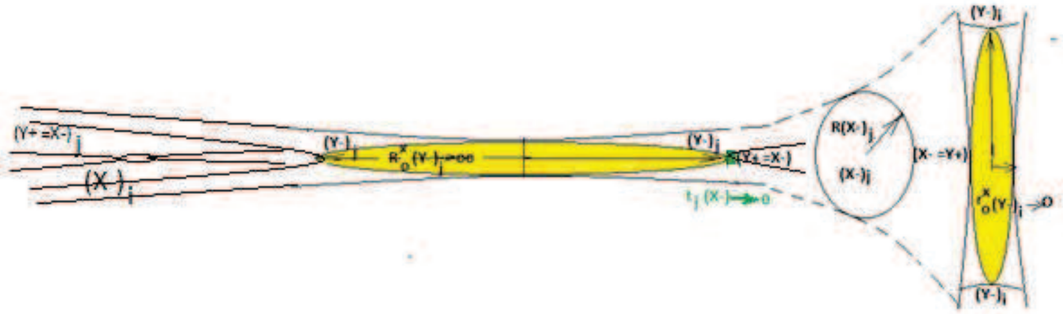


Fig.7a. quantum relativistic dynamics

In quantum gravity, we are talking about quantum dynamics: $e(Y-)_j \to \gamma(Y-)_i$ in $ОЛ_j$, and $ОЛ_i$ physical vacuum levels at the (m) convergence of the entire Universe. In the unified Criteria of the Evolution of space-matter, the density $\left(\rho = \frac{\text{ПК}}{\text{К}^3} = \frac{1}{\text{Т}^2} = \nu^2\right)$, give $\text{c} = \frac{\lambda(Y-)_J \to 0}{T(Y-)_J \to 0}$ about zero parameters of the instantaneous "Explosion" infinitely large $\left(\rho(Y-)_J = \frac{1}{T(Y-)_J{}^2} \to \infty\right)$ density of dynamic masses in $(Y+=X-)_J$ field of the Universe. At infinitely small $(T(Y-)_J \to 0)$ periods of dynamics, in dynamic space-matter:
$\text{НОЛ} = (T(Y-)_J \to 0) * (t(Y+=X-)_J \to \infty) = 1$, in the $(X-)_J$ field of the Universe, an infinite number of events occur, in "compressed time" $(t(Y+=X-)_J \to \infty)$, with the origin $\big(T(Y-)_J = 1\big) * \big(t(Y+=X-)_J = 1\big) = 1$, time $\big(t(X-)_J = 1\big)$. And already in such a physical vacuum in $(\rho(X+=Y-)_i \to 0)$, quanta $(\gamma(Y-)_i = (\rho(Y-)_i \to 0)$ with near zero mass density. And we are talking about the radius of the sphere of a non-stationary Euclidean expanding space, $R(X-)_J \to \infty$, on (m) convergence, and $r(X-)_i \to 0$, on (n) convergence, i.e. superluminal speeds: $(w_i = \alpha^{(-N=-1,-2\ldots)} * c)$, in $(ОЛ_i)$ levels of physical vacuum. Moreover, $\lambda(X-)_J \to \infty$, and $\lambda(X-)_i \to 0$, $\text{c} = \frac{\lambda(X-)_i \to 0}{T(X-)_i \to 0}$, with density $\left(\rho(X-)_i = \frac{1}{T(X-)_i{}^2} \to \infty\right)$ at the limit level $(ОЛ_i)$, as the "bottoms" of the physical vacuum.

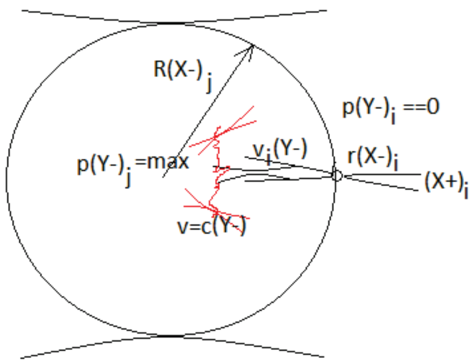


Fig.8. to the dynamics of the space-matter of the Universe

In quantum gravity, the acceleration of mass trajectories $(Y- = \text{X}+)$ in a gravitational field $G(\text{X}+)\left[\frac{K}{\text{T}^2}\right] = \psi \frac{\hbar}{\Pi^2\lambda} G \frac{\partial}{\partial t} grad_n R g_{ik}(\text{X}+)\left[\frac{K}{\text{T}^2}\right]$ maximum, for $\lambda(X-)_i \to 0$, in $(ОЛ_i)$ levels of the physical vacuum. We are talking about the superluminal velocity space $(w_i = \alpha^{(-N=-1,-2\ldots)} * c)$, $\gamma_i(Y-)$ photons of the $(ОЛ_i)$ level, with their dynamics period: $c=\frac{\lambda(Y-)_{i\to\infty}}{T(Y-)_{i\to\infty}}$, $T(Y-)_i\to\infty$.This means that at infinite radii $R(X-)_J\to\infty$ "at the bottom" of the physical vacuum, at each of its points $r(X-)_i\to 0$, at (n) convergences, the Universe "disappears" in time: $t=(n=0)*T(Y-)_i=0$. "At the bottom" of the physical vacuum, in (ОЛ_i) levels, we cannot fix events by photon $\gamma_i(Y-)$ with dynamics period $T(Y-)_i\to\infty$. In this case, any density: of dynamic masses $\left(\rho(Y-)_J=\frac{1}{T(Y-)_J^{\,2}}\to\infty\right)$, including photons: $\gamma_i(Y-)$of all (ОЛ_i) levels, to about zero $(\rho(Y-)_i\to 0)$ mass densities of the physical vacuum, with acceleration $G(X+)$, on (n) convergence at each point of the space-matter of the entire $(R(X-)_J\to\infty)$ Universe. An "expanding Universe" effect is created with the effect of the primary $(T(Y-)_J\to 0)$ "Big Bang". At the same time, the speed of light, $\gamma(Y-)$ photon (ОЛ_1) level, remains unchanged in any level of physical vacuum: $c=\frac{\lambda(Y-)_{i\to\infty}}{T(Y-)_{i\to\infty}}=c=\frac{\lambda(Y-)_{j\to 0}}{T(Y-)_{j\to 0}}=c=\frac{\lambda(X-)_{i\to 0}}{T(X-)_{i\to 0}}$. For $\gamma(Y-)$ photons of the (ОЛ_1) level, "falling" into near-zero mass densities $\left(\rho(Y-)_i=\frac{1}{T(Y-)_i^{\,2}}\to 0\right)$, with acceleration $G(X+)\left[\frac{\text{K}}{\text{T}^2}\right]=\upsilon*\text{H}\left[\frac{\text{K}}{\text{T}^2}\right]$, where (H) fixed Hubble constant: $\text{H}=\frac{v}{R}$. The wavelength $\gamma(Y-)$ of photons increases when "falling into near zero density" at the limiting radii $(R(X-)_J\to\infty)$ of the Universe, in the limiting depth of the physical $(r(X-)_i\to 0)$ vacuum. These "relic $\gamma(Y-)$ photons" (ОЛ_1) level (red in the figure) are seen in experiments. Further we speak about superluminal $\gamma_i(Y-)$ photons. The mathematical truth is that on the infinite radii of the entire space-matter of the Universe $\text{R}_j(X-)\to\infty$ with its mass $\lambda_i(Y-)\to\infty$ trajectories, the density of matter $(\rho_j(X-)\to 0),(\rho_i(Y-)\to 0)$, tends to zero. The proper time of dynamics t is reduced to zero in the axioms $\text{НОЛ}=(t_i(Y+)\longrightarrow 0)T_i(Y-)\longrightarrow\infty)=1$ dynamic space-matter, as well as acceleration dynamics: $(\text{b}=(R_j(X-)\to\infty)(\rho_j(X-)\to 0)\ =const)$, $(\text{b}=(\lambda_i(Y-)\to\infty)(\rho_i(Y-)\to 0)=const)$ mass trajectories. In other words, the mathematical truth is the disappearance of the dynamic space-matter mass at infinity, and the Universe disappears in time $t_i(Y+=X-)\longrightarrow 0$ with the acceleration same $(\text{b}=const)$ of the entire space-matter. On the other hand, $r_i(X-)\to 0$ takes place $(\rho_i(X-)\to\infty$, and the beginning $(\lambda_j(Y-)\to 0)$, $(\rho_j(Y-)\to\infty)$, such ("Explosion"), "instantaneous" $T_j(Y-)\to 0$, period of the Universe dynamics. The quantum dynamics of the space-matter of the Universe in the quantum coordinate system, during the expansion of the Universe, is due to the primary "failure" of the densities $\rho_j(Y-=e_j)$ to near-zero mass $\downarrow(\rho_i(Y-=\gamma_i)\ \approx 0)$ density of the physical vacuum . In the axioms of dynamic space-matter:

$$\text{НОЛ}=\text{КЭ}(X-=Y+)\text{КЭ}(Y-=X+)=1,\ \text{and}\quad \text{НОЛ}=\text{КЭ}(m)\text{КЭ}(n)=1,$$

each $(X\pm)$ and $(Y\pm)$ quantum $\text{ОЛ}_{ji}(m)$ of the spectrum corresponds to the dynamic conditions $cos^2\varphi_X cos^2\varphi_Y=1$ and $0\le\varphi<\varphi_{max}$, $\varphi\ne 90^0$, $ch(Y/X_0)*cos\varphi_Y=1$, $ch(X/Y_0)*cos\varphi_X=1$, with Interaction constants: $cos^2\varphi_X=G=6{,}672*10^{-8}$, and $cos\varphi_Y=\alpha=1/137{,}036$. This means that with a decrease in the angles of parallelism $\varphi_i(Y-)\to 0$ with the disappearance of fields, the angles of quanta $\varphi_i(X-)\to\varphi_{MAX}(X-)$ increase, and vice versa. In this case, matter does not disappear, but passes from one type to another, in the form of a change in dominant fields along their $\text{ОЛ}_{ji}(m)$ spectrum.

4. Properties of indivisible quanta in the quantum coordinate system.

We can determine the limiting parameters of the space-matter dynamics of the entire Universe, in a quantum coordinate system. Speaking about the space of velocities $e_j(Y-)$ and $\gamma_i(Y-)$ of quantum's $\text{ОЛ}_{ji}(m)$ of the quantum coordinate system, by analogy with the velocities of an electron and a photon: $w_e=\alpha^{N=1}*c$, we can say about the speeds $w(e_j)=\alpha^N*c$, macro electrons (ОЛ_j) levels and $w(\gamma_i)=\alpha^{-N}*c$, already superluminal sub photons (ОЛ_i) physical vacuum levels. We will define limit values (N). For the (ОЛ_1) level $(p,e,\nu_\mu,\gamma_{0,}\nu_e,(\gamma=c))$ the Planck length and time are defined:

$$l_{pl}=\sqrt{\frac{Gh}{c^3}}=\sqrt{G}K=\sqrt{\frac{6.67*10^{-8}*6.62*10^{-27}}{(3*10^{10})^3}}=4*10^{-33}sm$$

$$T_{pl}=\sqrt{\frac{Gh}{c^5}}=\sqrt{G}T=\sqrt{\frac{6.67*10^{-8}*6.62*10^{-27}}{(3*10^{10})^5}}=1.35*10^{-43}s\text{ , где}\qquad\sqrt{G}=\cos\varphi_X$$

These limit values of length (l_{pl}) and time (T_{pl}) are calculated with the constant $\sqrt{G}$, and refer to the limit quantum $(X\pm=\nu_i)$ of the level (ОЛ_i) of the physical vacuum. From the relation $T_{pl}=\sqrt{\frac{Gh}{c^5}}=\sqrt{G}T_i=1.35*10^{-43}s$, for the period (T_i) of the quantum dynamics (ν_i), we get:

$$(\sqrt{G})^N*1=1.35*10^{-43}s\text{ , or }\ N=log_{\sqrt{G}}(T_{pl}=10^{-43})\text{ , and }\ N=-43\frac{ln10}{ln\sqrt{G}}\approx 12.$$

In the spectrum of (ОЛ_i) levels, $N=12$ corresponds to the sub neutrino quantum (ν_{24}) with the isopotential of the sub photon quantum $(\gamma_{24}^{+}=\alpha^{-12}*c)$. By analogy with the emission of a photon by an electron

$(e \to \gamma)$ similarly to a neutrino $(p \to \nu_e[N=0])$ proton, we are talking about radiation in (ОЛ_i) levels of the physical vacuum:

$(\gamma \to \gamma_2[N=1])$, $(\gamma_2 \to \gamma_4[N=2])$, $(\gamma_4 \to \gamma_6[N=3])$, $(\gamma_6 \to \gamma_8[N=4])$,… $(\gamma_{22} \to \gamma_{24}[N=12])$… and $(\nu_e \to \nu_2[N=1])$, $(\nu_2 \to \nu_4[N=2])$, $(\nu_4 \to \nu_6[N=3])$, $(\nu_6 \to \nu_8[N=4])$,… $(\nu_{22} \to \nu_{24}[N=12])$.

In the axioms of dynamic space-matter, $\text{НОЛ} = \text{КЭ}(m)\text{КЭ}(n) = 1$, we obtain for the masses (M) of indivisible quanta in (ОЛ_{ji}) levels:

$$\text{НОЛ} = M(e_1 = 1{,}15\ \text{E}4\ )(k = 3.13)M(\gamma_0 = 3.13.\text{E}-5\ ) = 1$$
$$\text{НОЛ} = M(e_2 = 3{,}524\ \text{E}7\ )(k = 3.13)M(\gamma = 9{,}07\ \text{E}-9\ ) = 1$$
$$\text{НОЛ} = M(e_3 = 5{,}755\ \text{E}11\ )(k = 3.86)M(\gamma_1 = 4.5.\text{E}-13\ ) = 1$$
$$\text{НОЛ} = M(e_4 = 1{,}15\ \text{E}16\ )(k = 3.13)M(\gamma_2 = 2{,}78\ \text{E}-17\ ) = 1$$
$$\text{НОЛ} = M(e_5 = 3{,}97\ \text{E}19\ )(k = 3.13)M(\gamma_3 = 8.05.\text{E}-21\ ) = 1$$
$$\text{НОЛ} = M(e_6 = 6{,}48\ \text{E}23\ )(k = 3.83)M(\gamma_4 = 4{,}03\ \text{E}-25\ ) = 1$$
$$\text{НОЛ} = M(e_8 = 4{,}47\ \text{E}31\ )(k = 3.14)M(\gamma_6 = 7{,}13\ \text{E}-33\ ) = 1$$

…………………………

$$\text{НОЛ} = M(e_{26} = 9{,}1\ \text{E}103\ )(k = 3.14)M\big(\gamma_{24} = 3{,}5\ \text{E}-105\ \big) = 1$$

Obviously, we are talking about vortex mass $(Y-)$trajectories: $c * rot_X M(Y- = \gamma_i) = \varepsilon_2 * \frac{\partial G(X+)}{\partial T} + \lambda * G(X+)$ equations of dynamics in a circle $(k = 3.14 = \pi = \frac{2\pi R = l}{2R})$ in each (ОЛ_i) level of the physical vacuum.

Therefore, we are talking about exactly such radiations already in (ОЛ_j) levels of the physical vacuum: $(e \to \gamma[N=0])$, because: $w(\gamma) = \alpha^{N=0} * c) = c$, $w(e) = \alpha^{N=1} * (\gamma = c)$ and further:

$(e_2 \to e[N=2])$, $(e_4 \to e_2[N=3])$, $(e_6 \to e_4[N=4])$… $(e_{26} \to e_{24}[N=14])$, likewise:
$(p_2 \to p[N=2])$, $(p_4 \to p_2[N=3])$, $(p_6 \to p_4[N=4])$… $(p_{26} \to p_{24}[N=14])$.

We are talking about the space-matter of the entire Universe, defined by constants: $(\hbar,\ \text{c},\ G,\ \alpha)$. The radiation itself in (ОЛ_j) levels of the physical vacuum is caused by acceleration (b) in the relativistic dynamics of the entire space-matter: $b^2(R\uparrow)^2 - b^2c^2(t\uparrow)^2 = (c^4 = F)$ giving the potentials:

$$\left(b = \frac{K}{T^2}\right)(R = K) = \frac{K^2}{T^2} = \Pi \text{ , "dark" energy:}$$
$$(\Pi_1^2 - \Pi_2^2)K = (\Pi_1 - \Pi_2)K(\Pi_1 + \Pi_2) = (\Delta\Pi_1)(X+ = Y-)\downarrow K(\Delta\Pi_2)(X- = Y+)\uparrow = FK = U$$

For all quanta $\text{ОЛ}_{ji}(m)$ of the spectrum, the period of dynamics $(0 \leftarrow T \to \infty)$ takes place has a different "scale", but always for $(T = 1)$ the wavelength $\lambda(e_j)\downarrow = w(e_j) * (T = 1) = \alpha^N * c * (T = 1)$ for macro electrons, and $\lambda(\gamma_i)\uparrow = w(\gamma_i) * (T = 1) = \alpha^{-N} * c * (T = 1)$ for sub photons. In the Planckian length limits in the axioms of dynamic space-matter: $(R_j) * (R_i = 4 * 10^{-33} sm) = 1$ we have limiting $(R_j) = 2.5 * 10^{32} sm$, sizes with near zero mass densities: $(\rho_i(Y-) \to 0)$, in (ОЛ_i) levels of the physical vacuum.

The dynamics of matter $(\varphi \neq const)$ is fixed in the Euclidean $(\varphi = 0)$, $(\varphi = const)$, axiomatic of the Evolution Criteria formed in the space $(K^{\pm N}T^{\mp N})$ of time. To each $(\varphi = const)$ fixed state corresponds to its own space-time, as well as the Criteria of Evolution, in accordance with the Theories of Relativity. In the Indivisible Area of Localization,

$$\text{НОЛ} = M(e_{26} = 9{,}1\ \text{E}103\ )(k = 3.14)M(\gamma_{24} = 3{,}5\ \text{E}-105\ ) = 1 \ ,$$

the exoquasar quantum $(Y\pm = e_{26})$ corresponds to the speed $w(e_{26}) = \alpha^{N=14} * c$. In the coordinate system of atomic (p/e) structures ОЛ_1 of the level of ordinary atoms, where $(w_e = \alpha * c)$ is the electron velocity, there is a relation relative to the electron $N = 13$ in the form:

$$\text{НОЛ} = w_j(e_{26}) * w_i(\gamma_{24}) = (\alpha^{13} w_e) * (\alpha^{-13} w_e) = w_e^2 = \Pi_e = 1$$

In this case, the wavelength $\lambda(e_{26}) = \alpha^{13}(\lambda(e) = w_e(T_j = 1))$ is calculated, through the electron wavelength,

$$\lambda(e) = \frac{h}{m_e \alpha * c} = \frac{6.626 * 10^{-27} * 137.036}{9.1 * 10^{-28} * 3 * 10^{10}} = 3.32 * 10^{-8} sm\ , \quad \lambda(e_{26}) = \alpha^{13}\lambda(e) = 5.5 * 10^{-36} sm\ ,$$

And the first emitted quanta, $(e_{26}) \to \alpha(e_{24})$, have: $2\lambda(e_{24}) = 2\alpha^{-1}\lambda(e_{26}) = 1.5 * 10^{-33} sm$, dimensions in circles corresponding to the Planck dimensions $(\lambda_{pl} = 4 * 10^{-33} sm)$ calculated in $(\hbar, G, c)$ constants.

From the experimental data, for the minimum $(\lambda_i \approx 10^{-16} sm)$ distances are measured by $(Y\pm = \gamma)$ quanta, with the dynamics period: $T = \frac{\lambda_i}{c} \approx 10^{-26} s = \alpha^N T_i$, value (N) for period: $(T_i = 1)$ of dynamics, calculated: $10^{-26} = \alpha^N(T_i = 1)$, $N = -26 log_\alpha 10 = -26\frac{\ln 10}{\ln \alpha} \approx 12$, $N = 12$. This order (ОЛ_i) of the spectrum corresponds to $(Y\pm = \gamma_{24})$ a sub photon quantum. It corresponds to the quantum $(Y\pm = e_{26})$, with wavelength $\lambda(e_{26}) = r_{26} = 5.5 * 10^{-36} sm$, within the entire Universe: $\text{НОЛ} = R_{26} r_{26} = 1$ or $R_{26} = \frac{1}{r_{26}} = 1.8 * 10^{35} sm$ in radius sphere: $R = \frac{\alpha^{-12} * c(T=1)}{2\pi} = \frac{4.3855 * 10^{25} 3 * 10^{10}}{6.28} \approx 2.1 * 10^{35} sm$,

(1 light year=365.25*24*3600*3*10^{10}=9.5*10^{17} sm). In both cases, we are talking about sizes of the order

$R = 2 * 10^{17}$ light years. Today, the fixed limits of the Universe are about $R_i \approx 14$ billion light years. In the quantum coordinate system $ОЛ_{ji}(m)$ of dynamic space-matter, we have about 15 billion such fixed Universes.

5. Valid objects of the Universe

The objects of the Universe will be called "sphere-points" $ОЛ_{ji}(n)$ of convergence, in each fixed "point" $ОЛ_{ji}(m = const)$, quantum coordinate system. For example, objects:

$$НОЛ = M(e_2 = 3{,}524\ \mathrm{E}7)(k = 3.13)M(\gamma = 9{,}07\ \mathrm{E} - 9) = 1$$

by analogy with the core (p/e) of ordinary atoms, we are talking about quanta (p_2/e_2) of the nucleus of a star. Stars with such a core have a limiting energy level of the physical vacuum, at the level of (γ) photon. Below the energy of a photon, in the physical vacuum, the star does not manifest itself. Like proton radiations $(p^+ \to \nu_e^-)$ antineutrinos, we are talking about radiations of antimatter matter and vice versa. That is: $(p_8^+ \to p_6^-)$, $(p_6^- \to p_4^+)$, $(p_4^+ \to p_2^-)$, $(p_2^- \to p^+)$, with the corresponding atomic nucleus: (p^+/e^-) substances of an ordinary atom, (p_2^-/e_2^+) antimatter of the nucleus of a "stellar atom", (p_4^+/e_4^-) the matter of the galaxy core, (p_6^-/e_6^+) the antimatter of the quasar core, and (p_8^+/e_8^-) the matter of the core of the "quasar galaxy".

Further, we proceed from the fact that the quantum (e_{*1}^-) of matter $(Y- = p_1^-/n_1^- = e_{*1}^-)$ of the core of planets emits a quantum $(e_{*1}^+ = 2 * \alpha * (p_1^- = 1{,}532E7\ MeV)) = 223591MeV$, or: $\frac{223591}{p=938{,}28} = e_{*1}^+ = 238{,}3 * p$ Uranium nuclei. This «antimatter» $(e_*^+ = {}^{238}_{92}U = Y-)$ is unstable, and exothermically decays into a spectrum of atoms, in the core of planets.

In the superluminal level $w_i(\alpha^{-N}(\gamma = c))$ of the physical vacuum, such stars do not manifest themselves. Further, we are talking about the substance $(p_3^+ \to p_1^-)$ of the core $(Y- = p_3^+/n_3^0 = e_{*3}^+)$ of "black spheres", around which, in their gravitational field, globular clusters of stars form. Similarly, below, we are talking about radiation of antimatter by matter and vice versa: $(p_6^+ \to p_5^-)$, $(p_5^- \to p_3^+)$, $(p_3^+ \to p_1^-)$, $(p_1^- \to \nu_\mu^+)$. The general sequence is: $p_8^+, p_7^+, p_6^-, p_5^-, p_4^+, p_3^+, p_2^-, p_1^-, p^+, \nu_\mu^+, \nu_e^-$ ....

Further: $НОЛ = M(e_4 = 1{,}15\ \mathrm{E}16)(k = 3.13)M(\gamma_2 = 2{,}78\ \mathrm{E} - 17) = 1$. These quanta (p_4/e_4) of galactic nuclei are surrounded by individually emitted quanta (p_2/e_2) of stellar nuclei, and are the reason for their formation. Such nuclei of galaxies, in the equations of quantum gravity, have spiral arms of mass trajectories narrower: $w_i(\gamma_2 = \alpha^{-1}c) = 137 * c$, in superluminal velocity space. Below the energy $(w_i = 137 * c)$ of light photons in the physical vacuum, galaxies do not manifest themselves. Outside galaxies, we are talking about core quanta $(Y- = p_5^-/n_5^- = e_{*5}^-)$ of mega stars. They generate $(e_{*5}^- = 2 * \alpha * p_5^- = e_{*4}^+ = 290p_4^+)$ set of galactic nucleus quanta. Similarly next: $НОЛ = M(e_6 = 6{,}48\ \mathrm{E}23)(k = 3.83)M(\gamma_4 = 4{,}03\ \mathrm{E} - 25) = 1$. We are talking about quanta $(Y- = p_6^-/n_6^- = e_{*6}^-)$ of the core of quasars, which also individually emit (p_4/e_4) quanta of the nucleus of galaxies. In other words, the core of a quasar is surrounded by quanta of the core of a galaxy. They say that the quasar is at the center of the galaxy. Such quasars plunge into the physical vacuum level up to superluminal speeds $w_i(\gamma_4 = \alpha^{-2}c) = (137^2 * c)$. This is deeper than the physical vacuum level of the galaxy. These are completely different objects. In other words, quasars bend space-matter at the level of ⟦(γ)⟧_4) quanta. Further, we are talking about quanta of matter of the nucleus $(Y- = p_7^+/n_7 = e_{*7}^+)$ of "black spheres", around which clusters of galaxies form in their gravitational field, and Further: $НОЛ = M(e_8 = 4{,}47\ \mathrm{E}31)(k = 3.14)M(\gamma_6 = 7{,}13\ \mathrm{E} - 33) = 1$. We are talking about quanta (p_8/e_8) of the nucleus of quasar galaxies, which also individually emit quanta $(p_6^-/n_6^- = e_{*6}^-)$ of the nucleus of quasars. Such quasar galaxies plunge into the physical vacuum level up to superluminal speeds $w_i(\gamma_6 = \alpha^{-3}c) = 137^3 * c$. Similarly next.

In the axioms $НОЛ = КЭ(m)КЭ(n) = 1$, or $M_j(X+) * M_i(Y-) = 1$, dynamic space-matter, we are talking about the source of gravity of the gravitational mass $M_j(X+)$ in $ОЛ_j$ levels and inertial $M_i(Y-)$ masses in в $ОЛ_i$ levels of the physical vacuum, with their Einstein equivalence principle in a single gravitational $(X+ = Y-)$ mass field. These masses: $M_j * M_i = (M = ПК)^2 = 1$, in the form of a quadratic form, are represented in the quantum fields of their interaction:

$$\hbar = Gm_0 \frac{\alpha}{c} Gm_0(1 - 2\alpha)^2 = GM_j \frac{\alpha}{c} GM_i(1 - 2\alpha)^2 = \frac{(6{,}674*10^{-8})^2*(1-2/(137.036))^2}{137.036*2.993*10^{10}} = 1.054508 * 10^{-27}$$

in quantum: $G(X+)\left[\frac{K}{T^2}\right] = \psi \frac{\hbar}{\Pi^2\lambda} G \frac{\partial}{\partial t} grad_n R g_{ik}(X+)\left[\frac{K}{T^2}\right]$, gravity$(X+ = Y-)$mass fields. Thus, the limiting mass $M_j(X+)$ of the source of gravity is determined by $M_i(Y-)$ inertial mass of mass $(Y- = \gamma_i)$ fields in $ОЛ_i$ levels of the physical vacuum, as an object $ОЛ_{ji}(n)$ of convergence or:

$НОЛ = ОЛ_{ji}(n) = M_j(X+) * M_i(Y- = \gamma_i) = 1$. Thus, we obtain the limiting masses in the Universe: for example, for a star $M_j(X+) = M_2(p_2^-/n_2^0) = 1/(\gamma)$ under the conditions $(e_2^+ * (k) * \gamma) = 1$. Similarly:
Limit mass of planets, for $1MeV = 1.78 * 10^{-27} g$:
$\frac{1}{\gamma_0} = \frac{1}{3.13*10^{-5}MeV*1.78*10^{-27}g} = M_1(p_1^-/n_1^-) \approx 1.8 * 10^{31} g \approx \frac{M_s}{100}$, where($M_s = 2 * 10^{33} g$) is the mass of the Sun.
Further, the limiting mass of stars, with a nucleus of antimatter:
$\frac{1}{\gamma} = \frac{1}{9.07*10^{-9}MeV*1.78*10^{-27}g} = M_2(p_2^-/n_2^-) \approx 6.2 * 10^{34} g \approx 31M_s$, or ranging from $\frac{M_s}{100}$ to $31M_s$ mass.
Similarly, the limiting mass $(p_3^+/n_3^0 = e_{*3}^+)$ of "black spheres", with a nucleus of matter:
$\frac{1}{\gamma_1} = \frac{1}{4.5*10^{-13}MeV*1.78*10^{-27}g} = M_3(p_3^+/n_3^0) \approx 1.25 * 10^{39} g \approx 625220M_s$, from $31M_s$ to $625220M_s$ mass.
limiting mass of a galaxy, $(p_4^+/n_4^0 = e_{*4}^+)$ with a nucleus of matter:
$\frac{1}{\gamma_2} = \frac{1}{2.78*10^{-17}MeV*1.78*10^{-27}g} = M_4(p_4^+/n_4^0) \approx 2 * 10^{43} g \approx 10^{10} M_s$, from $625220M_s$ to $10^{10}M_s$ mass.
limiting mass of an extragalactic mega star, $(p_5^-/n_5^- = e_{*5}^-)$ with an antimatter nucleus:
$\frac{1}{\gamma_3} = \frac{1}{8.05*10^{-21}MeV*1.78*10^{-27}g} = M_5(p_5^-/n_5^-) \approx 7 * 10^{46} g \approx 3{,}5 * 10^{13} M_s$, from $10^{10}M_s$ to $3{,}5 * 10^{13}M_s$ mass.
limiting mass of an extragalactic mega star, $(p_6^-/n_6^- = e_{*6}^-)$ with an antimatter core:
$\frac{1}{\gamma_4} = \frac{1}{4.03*10^{-25}MeV*1.78*10^{-27}g} = M_6(p_6^-/n_6^-) \approx 1{,}4 * 10^{51} g \approx 7 * 10^{17} M_s$, from $3{,}5 * 10^{13}M_s$ to $7 * 10^{17}M_s$ mass.
....

Each kernel of such objects $ОЛ_{ji}(n)$ of convergence generates a set of corresponding quanta $(2 * \alpha * p_j^{\pm} = e_{*j}^{\mp} = N\, p_{j-1}^{\mp})$ specified in table, and emits $(p_j^{\pm} \to p_{j-2}^{\mp})$. This is a set (N) of quanta of the nucleus of planets, stars, galaxies, quasars…. For example, the core of the Sun, like a star, emits hydrogen nuclei $(p_2^- \to p^+ \to \nu_e^-)$ and electron antineutrino, but generates $(2 * \alpha * p_2^- = e_{*2}^+ = N\, p_1^+)$ quanta of, shall we say, "stellar matter" (p_1^+/e_1^-) in the solid surface of a star. This "stellar matter" (p_1^+/e_1^-) cannot interact with hydrogen (p^+/e^-) , but it can emit muonic antineutrino $(p_1^+ \to \nu_\mu^-)$, and positron, which forms muons: $(Y\pm= \mu) = (X-= \nu_\mu^-)(Y+= e^+)(X-= \nu_e^-)$, in the Earth's atmosphere. Or, the core quanta of a mega star with $(p_5^-/n_5^- = e_{*5}^-)$ emit $(p_5^- \to p_3^+)$ matter quanta, but generate core quanta galaxies $(2 * \alpha * p_5^- = e_{*5}^+ = N\, p_4^+)$. We see, as it were, the "surface" of the galaxy, but the core of such an object $ОЛ_{ji}(n)$ convergence, has a mass ranging from $(10^{10} M_s)$ to $(3.5 * 10^{13} M_s)$ solar masses.

We are talking about admissible objects $ОЛ_{ji}(n)$ of convergence, in the dynamic space-matter of the Universe. At the same time, the calculated causal relationships are indicated.

6. Intergalactic spacecraft without fuel engines.

The physical reality is the different space of the velocities of the Sun and the Earth. Without any fuel engines, the Earth flies in the space of the physical vacuum at a speed of $30км/с$, and the Sun at a speed of the order of $265км/с$. We are talking about the main property of space-matter - movement. The mass flow $(Y-)_A$ of the apparatus is created by the fields of Strong and Gravitational Interaction of energy quanta $(X\pm = p_1)$, $(X\pm = p_2)$, $ОЛ_2$ the level of indivisible quanta of the space-matter of the physical vacuum, interconnected by the same $(X+)$ fields on the trajectories $(X-)$ of the module, without an external energy source.

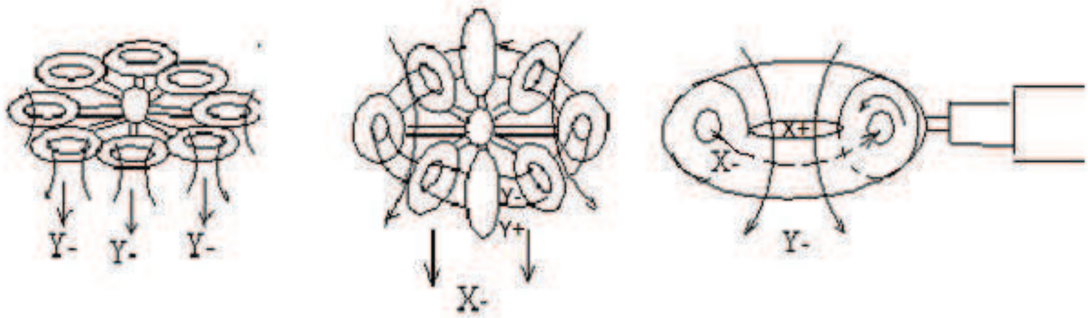


Fig.9. Intergalactic spacecraft without fuel engines.

Consistently including the space of velocities, the apparatus $(Y-)_A$, $(X-)_A$ in the level of the singularity of the physical vacuum, the apparatus goes along the radial trajectory from the level of the singularity of the physical vacuum of the quantum $(X\pm)$ of the space-matter of the planet, $(Y\pm)$ the space-matter of the star , $(X\pm)$ the space-matter of the galaxy, $(Y\pm)$ the space-matter of the cluster of galaxies, to other clusters and galaxies in field of the Universe, with reverse inclusions when returning to the planet of one's own or another galaxy.

Thus, it is necessary to create full periods of quanta $(Y-=\gamma_i)_A$, the space of velocities by the fields $(Y-)_A = (X+=p_j)+(X+=p_j)$ of "heavy" quanta as a "working substance", closed on the trajectory (X-) of the "ring" of the apparatus with Indivisible Localization Area $НОЛ = (e_j)k(\gamma_i) = 1$. From the ratios for quanta, $T_J(X-=p_J)\to\infty$, $\lambda_J(X-=p_J)\to\infty$, the greater the quantum mass $(X-=p_J)$ formed $(p_j = 2(e_{j-1})/G)$ by quanta (e_{j-1}), the greater $\lambda_J(X-=p_J)$, the greater the diameter of the "ring" D of the device. For ratios $(E=\Pi^2K_X)(X-)(E=\Pi^2K_Y)(X+)=НОЛ(X\pm=p_J)$, there are ratios $\uparrow E(X-)\downarrow E(X+)=НОЛ(X\pm=p_J)$, or $\uparrow K_X(X-)K_Y\downarrow(X+)=НОЛ(X\pm=p_J)$, as well as for masses $\uparrow(m=\Pi K_X)(X-)(m=\Pi K_Y)\downarrow(X+)=НОЛ(X\pm=p_J)$. The entire mass is concentrated in the field $(X-=p_J)$ formed by the electric fields $(X-=p_J)=(Y+=e_{J-1})(Y+=e_{J-1})$ of mass $(Y-=e_{J-1})$ trajectories, in the form $m(X-=p_j)=2m(Y-=e_{j-1})/G)$ of mass fields. It means that in the created quanta $НОЛ=\lambda(Y+=e_{J-1})\lambda(Y-=e_{J-1})=1$ it is enough to know the wavelength $\lambda(Y+=e_{J-1})=\dfrac{1}{\lambda(Y-=e_{J-1})}$, to calculate the order of the quanta $N(e_J)$ that form the trajectory of the "working substance" quanta $(X-=p_j)$.

For example, if for you need a "ring" of diameter , $D=\dfrac{2\lambda(X-=p_J)}{(\pi\approx 3)}$, $D=10м$, then

$\lambda(X-=p_J)=15м=\lambda(Y+=e_{J-1})$. That is, there is a quantum $\lambda(Y-=e_{J-1})=\dfrac{1}{\lambda(Y+=e_{J-1})}=6{,}67*10^{-3}см$ length . This corresponds to the relations $\lambda(Y-=e_{J-1})=6{,}67*10^{-3}см=2\pi*\alpha^N(\lambda_e=3.3*10^{-8}см)$, whence $\alpha^N=2*10^{-5}$, for $(J-1)$ gives $N=\log_\alpha 2*10^{-5}=\dfrac{\ln(2*10^{-5})}{\ln(\alpha=1/137)}=\dfrac{-10{,}82}{-4{,}92}=2.2\approx 2$. Then $(N_j=3)$ corresponds to the order of quanta $(\alpha^3*c)=W(e_4)$ of the working substance $(X-=p_4^+)$, in a "ring" with a diameter of 10m. Such "rings" give an intergalactic apparatus. The speed of an intergalactic apparatus with such a "working substance" $(X-=p_4^+)$, at the singularity level $НОЛ=m(e_4)*m(\gamma_2)=1$, is $V(Y-=\gamma_2)=\alpha^{-1}*c\approx 137*c$. For Earth time of 10 years, you can fly $(r=10лет*\alpha^{-1}*c)км$ or $(r=10*365{,}25*24*3600*137*3*10^5=1{,}3*10^{16}км=8{,}8*10^7\,а.е=425{,}8пк$. That is, our galaxy (30 kpc), the device will fly by in about 705 years. For the crew of such a vehicle, the proper time is $T=\alpha(705лет)=5{,}14лет$, the singularity (γ_2) level time. The greater the mass of the quantum (p_j), the greater the length of its "wave" $\lambda(X-=p_j)$. For $(N_J=4)$ quasar core matter $(X-=p_6^+)$ quanta, have $(N_{J-1}=3)$. Then from the relation $2\pi*\alpha^N(\lambda_e)=\lambda(Y-=e_{J-1=3})=6{,}28*(1/137)^3*3.3*10^{-9}см=8{,}14*10^{-15}см$, and we calculate

$$\lambda(Y+=e_{J-1=5})=\frac{1}{\lambda(Y-=e_{J-1})}=\frac{1}{8{,}14*10^{-15}см}=1{,}23*10^{14}см=\lambda(X-=p_6^+)$$

. This is $1{,}2*10^{14}см\approx 10^9км=8{,}2\ \ а.е.$ the diameter of the core $(X-=p_6^+)$ of an extragalactic quasar with core quanta. The "working substance" of such quanta $НОЛ=m(e_4)*m(\gamma_2)=1$ is given by flights already outside the galaxies in the Universe. For 10 years of Earth time, you can fly in the Universe, $(r=10лет*(V(\gamma_4)=\alpha^{-2}*c)=1{,}78*10^{18}км$ or 183 500 light years. For own time $t=\alpha^2(10лет)$ in the device or 4 hours 40 minutes. This is the time for $(Y-=\gamma_4)$ quanta, in the intergalactic level of the singularity of the physical vacuum.