The Nature of the Fundamental Particles
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The Nature of the Fundamental Particles

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Abstract: This article shows the way that vectors keep their Norm constant during motion and how this is succeeded through their intrinsic property which is the isochrones motion on a cycloid .It Shows also in a rigorous description, how nature is produced only from Euclidean Geometry and that is not attempting to establish any Philosophy or axioms of theories. All physical laws such as Momentum Newton`s second law of gravity, Maxwell`s equations of fields, conservation laws, Spring from geometry logic and are common to, the Large and Short scale distances without any exclusion principles or assumptions. Existing of everything follows the only one conservation law, that of Virtual work and not a logical starting point. [STPL] is a passage (mould = Tensor) from, Common Circle (which is a Plane) to Particles (reflected evanescent waves) with real part (s) and imaginary part (± v̄.∇i) and without any assumption, that reflected waves have an unknown phase shift. Reflected wave is equal to the incident wave (the real part to the real place and the imaginary part to the imaginary place with all incident properties (spin) included) i.e. different properties create distinct kinds of waves as these are the Fermions and Quarks of scalar magnitudes with ½ spin and Bosons of vector magnitudes with 1 spin. In Common circle circumference, the components of light waves interfere with each other to produce a Colour Spectrum because of Birefringence, a property of the (Centripetal) stress material with more than two indices, n, of refraction. [Retardation is the phase difference between the two light vectors through the material at different velocities (fast, slow) and determines colour Bands and as Retardation and stress (σ) go up then the colours cycle through a more or less repeating Pattern and the Intensity of the colours diminishes]. In Common Circle of equilibrium Space Anti-Space with different angular velocity vector, v = w r, in the absence of applied Torques produces the Colour Spectrum which is, the < Color Forces > → Gluon Red, Gluon Green, Gluon Blue and velocity of light on the circumference. Velocity vectors , *on common circle circumference* , collide with breakages as mass , giving then Kinetic Energy and move isochrones on a cycloid trajectory, from Space and Anti-Space points to [STPL] line . This procedure is succeeded from *the intrinsic property of vectors* which is , *norm* |v| *to be constant during motion and this* , by the front end material point A moving on a cycloid isochrones , to the other head point A again . Penetration of vectors (Force ,stress ,temperature , etc.) is the same as in , Lame`s stress ellipsoid representing Cauchy stress quadric of the Stress State at a point , Mohr circle can be applied to any symmetric 2x2 or 3x3 Tensor matrix and is graphically (geometrically) representing Cauchy stress Tensor , [STPL] can be applied to any 3x3 symmetric Tensor (which are Spaces, Anti-Spaces and Sub-Spaces) and is graphically representing the passage (mould = Tensor 6x3) from, Common Circle of Gravity Cave, in Lg = 3,969.10 ⁻ 62 m = 2r (a Plane) to Particles, with Velocities (v̄ = w̄r) that of light , and constitute the way that , material points move . Eventually, STPL is the hidden pattern of universe which connect the spaces , the twin black holes , and it is the Navel string of galaxies.

Key words: The nature of the Fundamental Particles , the Passage from Common Plane to Fundamental Particles , the Navel Cord of Galaxies , the isochrones motion of material points .

1. Introduction

The article shows The Fundamental Particles creation process from equilibrium ± Λ Momentum on Common Circle where (+ Λ - Λ = 0 and ± velocities ↻↻ collide). Rotational energy (Momentum ± Λ) is entering gravity cave Lg = 2.r = e^i.(- 9.π/2)b = 3,969.10 ⁻ 62 where it is balancing on Common Circle. [F5-1]

1.. The rotated energy [± Momentum → ± Λ∇i = r.mv = mr.(wr) = m(wr²/2)] Stabilizers at, Common Circle of 2r diameter which is the Sub-Space of the two opposite Momentum Spaces and Momentum Anti-Spaces.

2.. At Common Circle, and because velocities on the circumference are of opposite direction + v̄ ↑-v̄ ↓,collide.

3.. Collision of two vectors is equal to the Action of the two opposite quaternion (s + v̄.∇i).(©).(s + v̄.∇i) = s² - |v̄| ²

+ [2w̄].|s| |r|.∇i = $[r.w]^2$ - $[|\bar{w}x\bar{r}|]^2$ + 2w̄.(s r).∇i] which is composed of the three breakage quantities and are (1) → $[r.w]^2$, (2) → - $[|\bar{w}x\bar{r}|]^2$ = - $[r.w]^2$, (3) → 2w̄.(sr).∇i = 2w.(wr.r) = $2.(wr)^2$ all of Spinning nature (w), ½, ½, 1.

4.. The continually rotating velocity vector ± v̄ collides also with the three breakage quantities, which are not more breakable, they do not decay) giving them Thrust [The Action v̄ = w̄.r on Points (1), (2), (3)], and thus getting them off the Sub-space (the common circle) and Anti-Space (anti-circle) in a new Space, cylinder Layer producing thus the 6 different constituents of the three different breakage qualities for each constituent 6x3=18 particles .

5.. The transport becomes through the Extreme triangles of Space Anti-Space [STPL mechanism] , a creative Valve (mould) Communicating Space Anti-Space Quantities (for all Dipole AB = [λ , ± Λ x∇] and for all types of Energy) .

6.. Each of the three qualities , becoming from Space , Anti-Space and Sub-Space (the common circle) form the 6 Massive particles $[r.w]^2$, the Leptons , Anti-Leptons the 6 less massive particles - $[|\bar{w}x\bar{r}|]^2$, the Quarks , Anti-Quarks ,unsteady because of their constituents , the more energy breakage , all with ½ spin , with mass and energy , and because they are massive cannot occupy the same quantum state, and

7.. The third quality $2.[(\bar{w}^2 r^2)$.∇i] is of double spin S = 2.(1/2) = 1 = $2.[r.w]^2$ and is a vector directed to velocity vector, forming 6, the 3 massive Energy Colour particles $2.[(\bar{w}^2r^2)$.∇i], Gluons-Red → [gR], Gluons-Green → [gG], Gluons-Blue → [gB] and another 3 Weak and Zero forces particles $2.[(\bar{w}^2 r^2)$.∇i]W ±, γ Bosons, The three Colour Anti-Gluon →[ḡR]→ [ḡG], →[ḡB], and the 3 Anti-Weak and Zero forces particles –W ± = 0 = γ Bosons (specially permeable for Space, Anti-Space only) [30].

2. Complex Numbers - Quaternion

De Moivre´s formula for complex numbers states that the multiplication of any two complex numbers say z1,z2, or [z1=x1+i.y1, z2=x2+i.y2] where x = Re[z] the real part and y= Im[z] the Imaginary part of,z,is the multiplication of their moduli r1,r2, where moduli ,r, is the magnitude [r=|r|$\sqrt{x^2+y^2}$] and the addition of their angles,φ1,φ2, where φ = argz = atan2(y,x) and so, z1.z2 = (x1+i.y1).(x2+i.y2) = r1r2[cos(φ1+φ2)+i.sin(φ1+φ2)] and when z1=z2=z and φ1=φ2=φ then z = x+iy and z.z = z^2 = r^2(cos2φ+i.sin2φ) and for,w, complex numbers$z^w = r^w$. [cos(wφ) + i.sin2φ) ….(2-1) andso for r = 1 then → $z^w = 1^w$. $[\cos φ+i\sin φ]^w$ = [cos.wφ+i.sin.wφ].(2-2) The n.th root of any number z is a number b (√z=b) such that b^n =z and when z is a point on the unit circle, for r =1, the first vertex of the polygon where φ=0, is then [b = $(\cos φ+i\sin φ)]^n$ = b^n = z = cos(nφ)+i.sin(nφ) = $[\cos(360/n) + i.\sin(360/n)]^n$ = cos360 ° + i.sin360 ° = 1+0.i = 1 …. (2-3), i.e. the w spaces which are the repetition of any unit complex number z (multiplication by itself) is equivalent to the addition of their angle and the mapping of the regular polygons on circles with unit sides, while the n spaces which are the different roots of unit 1 and are represented by the unit circle and have the points z = 1 as one of their vertices, are mapped as these regular polygons inscribed the unit circle .Since also $z^w = \bar{z}^{\,n}$ and $\bar{z}^{\,n}$ = $\bar{z}^{\,1/w}$= $z+^n$ therefore complex numbers are even and odd functions, i.e. symmetrical about y axis (mirror) and also about the origin. Euler's rotation in 3D space is represented by an axis (vector) and an angle of rotation, which is a property of complex number and defined as z̄ = [s ± v̄.i] where s ,|v̄| are real numbers and i the imaginary part such that i^2 = -1. Extending imaginary part to three dimensions v1. i,v2.j,v3.k → v̄ ∇i becomes quaternion which has 1+3 = 4 degrees of freedom. De Moivre´s formula for the nth roots of a quaternion, where q = k.[cos.φ+ [∇i].sin.φ] is for w = 1/n, $q^w = k^w$.[cos.wφ + ε.sin.wφ] where q = z = ± (x+y.i), decomposed into its scalar (x) and vector part (y.i) and this because all the inscribed regular polygons in the unit circle have this first vertex at points 1or at -1 (for real part φ = 0, φ = 2π) and all others at imaginary part where, k = Tz = Tensor (the length) of vector ,z, in Euclidean coordinates which is k = Tz = $\sqrt{x^2+y1^2+y2^2+yn^2}$, and for imaginary unit vector ã (a1,a2,a3,a.n.w), the unit vector ε of imaginary part is→ ε = (y.i/Ty) = [y.∇ i] / [Ty] = ±(y1.a1+y2.a2+) / ($\sqrt{+y1^2+y2^2+yn^2}$) the rotation angle 0 < = φ < 2π, φ = ± $\sin^{-1}$(Ty/Tz), cosφ = x/Tz, which follow Pythagoras theorem for them and for all their reciprocal quaternions ã' (ã.ã' = 1). Since also the directional derivative of the scalar field y(y1, y2, yn.) in the direction ,i, is→ i (y1, y2, yn.) = i1.y1+ i2.y2.+ i n.yn and defined as i.grad y = i1.(∂y/∂1) + i2.(∂y/∂2) +…. = [i.∇].y, which gives the change of field ,y, in the direction → i , and [i.∇] is the single coherent unit, so coexistence between Spaces Anti-spaces and Sub-Spaces of any monad z̄ = x+y.i = ĀB and is happening through general equation which follows → m^± (^{a} + ^{d}.∇i) = q^w = $(Tq)^w$. [cos.wφ + ε.sin.wφ].(2-1) where m = lim$(1+1/w)^w$ for w = 1↦ ∞ , q = z = ±(x+y.i) sinφ = y/$\sqrt{x^2+y^2}$, cosφ = x/$\sqrt{x^2+y^2}$, |z| = $\sqrt{x^2+y^2}$, Tq = $\sqrt{x^2+y1^2+y2^2+ \dots yn^2}$, Ty = $\sqrt{y1^2+y2^2 + .yn^2}$ ε = (ȳ.i/Ty) = [ȳ.∇i] / [Ty] = (y1.a1+y2.a2+.) / ($\sqrt{y1^2+y2^2+\dots yn^2}$). Complex exponential is *Periodic* with period ,πi, as , $e^{\wedge(x+\pi i)}$ = $e^{\wedge x}.e^{\wedge(\pi i)}$ = $e^{\wedge x}$. [cos.xφ+i.sin.xφ]= $e^{\wedge x}$. Every quaternion ,q, is equal to its versor ,V(q), multiplied by its tensor (norm) , and for versor , V(q) = e^(0+πi) → then |V(q) | = √3 and quaternion q = V(q).√3.π .

Quaternion Actions : Action (©) of a quaternion z̄ = s + v̄.i = s + v̄.∇i on point P (a,x,y,z) is za = z̄p$\bar{z}^{-1}$ (screw motion) and for a ≠ 0 then z and a© z = az which have the same action z̄p$\bar{z}^{-1}$, meaning that quaternion is homogeneous in nature .Action of a Unit quaternion on a scalar s is z̄ = z̄s$\bar{z}^{1}$ = sz̄$\bar{z}^{1}$ = s Action of a Unit quaternion z̄ on a vector (v̄∇i) is z̄v$\bar{z}^{1}$ i.e another vector v̄ ' (quaternion) v¯ ' = (0,v̄'∇i), and of vector type v̄ '.∇i = z̄ + 2v̄ (v̄ x z̄) + 2v̄ x (v̄ x z̄). When the components of a vector w̄ (wx i+wy j+wz k) are expressed in terms of the three Euler angles ε,φ,θ

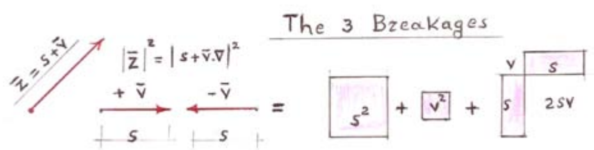
then is as quaternion z(zo+zx i+zy j+zz k), where
zo = cos(ε+θ) / 2.cos(φ/2), zx = - cos(θ-ε) / 2.sin(φ/2),
zy = sin(θ-ε) / 2.sin(φ/2), zz = - sin(ε+θ) / 2.cos(φ/2),
and the time derivative as [dz/dt] = (z / 2) x w.

Action of a Unit quaternion on a point p (a,x,y,z) is p' = z̄p$\bar{z}^{1}$, i.e. another point [takes the point P(s, v̄1∇i) to the point P' (s, v̄2∇i)] and if the point is on the unit axes, then the unit quaternion is representing rotation through an angle θ about the unit axis v and it is p' = (p ± sin(θ/2)v).

Action (©) of a quaternion z̄ = s + v̄.i = s + v̄.∇i on itself is the Binomial type i.e. (s + v̄.∇i)(©)(s + v̄.∇i) = $[s + \bar{v}.\nabla i]^2 = s^2 + |\bar{v}|^2.\nabla i^2 + 2|s|.|\bar{v}|.\nabla i$ =
$s^2 - |\bar{v}|^2 + 2|s|.|\bar{w}r|.\nabla i = s^2 - |\bar{v}|^2 + [2\bar{w}].|s|\,|r|.\nabla i$ where,
s^2 → is the real part of the new quaternion and it is a Positive Scalar magnitude.

- $|\bar{v}|^2$ → the always negative Anti-space which is always a Negative Scalar magnitude .

[2w̄].|s| |r̄|.∇i → the double angular velocity term which is a Vector magnitude. Fig (2-1) →



The Action of quaternion z̄.z̄ = [s + v̄.∇i] ²
z̄.z̄ = $[s + \bar{v}.\nabla i]^2 = s^2 - |\bar{v}|^2 + [2\bar{w}].|s|\,|r|.\nabla i$. F.(2-1)
Example :

It has been shown in [25] example 2 that, When vector w̄ (wx i+wy j+wz k) is the angular velocity vector, in the absence of applied torques, L (Lx i+Ly j+Lz k) = I.w = r̄xmv̄ = r̄p, is the angular momentum vector (where r = lever arm distance and m.v̄ = p, the linear or translation momentum) and I = (I1,I2,I3) are the Principal moments of Inertia then angular kinetic energy E = ½. w L = ½. I1.w1 ² + ½. I2.w2 ² + ½. I3.w3 ². Since both L and E are conserved as $L^2 = L1^2 + L2^2 + L3^2$ and E = $L1^2$ /2J1 + $L2^2$ /2J2 + $L3^2$ /2J3 and by division becomes 1 = [$L1^2$ /2TJ1] + [$L2^2$ /2TJ2] + [$L3^2$ /2TJ3] , [Poinsot's ellipsoid construction] and when L^2 / 2EJ = r^2p^2 /2E.2E/(w^2) = w^2. r^2xp^2/ ($4T^2$) = w^2 / [2E/ r̄xp]², then this is a Kinetic-Energy Inertial ellipsoid , dependent on the

total kinetic energy E, and the translational momentum p, with the three axes, a = [2E/ r̄xp1] , b = [2E/ r̄xp2] , c = [2E/ r̄xp3]. (Ellipsoid $x^2/a^2+y^2/b^2+z^2/c^2 = 1$ and when Sphere then $a^2=b^2=c^2=r^2$ the circle $x^2+ y^2+z^2 = r^2$) and resultant $E = \sqrt{a^2 + b^2 + c^2}$.
Considering $L^2/2J = J.J.w^2/2.J = Jw^2/2$ = r̄.p.w/2 then $E = |\sqrt{r1p1w1}|^2 + |\sqrt{r2p2w2}|^2 + |\sqrt{r3p3w3}|^2$ or $\sqrt{E^2} = \sqrt{a^2+b^2+c^2}$), i.e. a cuboid (axbxc) , rectangular parallelepiped, with dimensions **a** = $|\sqrt{r1p1w1}|$, **b** = $|\sqrt{r2p2w2}|$, **c** = $|\sqrt{r3p3w3}|$ and the length of the space diagonal (resultant) $E = \sqrt{a^2+b^2+c^2}$.
Because the position velocity of a quaternion z̄ = s+v̄∇i is [dž/ds] =(dž/ds,0)(s + v̄.∇i) = (1+dv/ds. ∇ī ⁾) and acceleration $[d^2z/ds^2]$ = (d/ds,0) (1+dv̄/ds. ∇ī ⁾) = (0, $d^2\bar{v}/ds^2$.∇i) and in Polar plane coordinates where angular momentum L = Iw = r̄xmv̄ = r̄p, then acceleration $[d^2\bar{z}/ds^2] = (d\bar{z}/ds,0)^2$ (s, rcosθ, rsinθ, 0) = (0, L^2/m^2r^3 + r, 2Ldr/ds / mr^2, 0) where,
a.. L^2 / m^2r^3 + r = the acceleration in the (r̄) radial direction,
b.. 2Ldr/ds / mr^2 = the acceleration in θ direction.
Since Points are nothing and may be anywhere in motionless space, so Position quaternion is referred to this space only, and generally the velocity and acceleration in a non-Inertial, rotating reference frame is as, space only, and generally the velocity and acceleration in a non-Inertial, rotating reference frame is as ,Velocity → [dž/dt] = (d/dt, ϖ) (0,ž) = (- ϖ.ž, ϖ x ž + dž /dt) and Acceleration →$[d^2ž/dt^2]$ = (d/dt,ϖ).(- ϖ.ž, dž /dt +ϖxž)= (- dϖ/dt.ž, $d^2ž /dt^2$+2 ϖx dž /dt + dϖ/dt x ž – ϖ.žϖ) where
→ - dϖ/dt.ž = the intrinsic acceleration of quaternion,
→ $d^2ž /dt^2$ = the translational alterations (they are in the special case of rotational motion where rotation on two or more axes creates linear acceleration in, one only different rotational axis J),
→ 2 ϖ x dž /dt + dϖ/dt x ž = the coriolis acceleration, a centripetal acceleration is that of a force by which bodies (of the reference frames) are drawn or impelled towards a point or to a centre (the hypothetical motionless non -rotational frame), → – ϖ.žϖ) = - ϖx(ϖxž) + $ϖ^2$ž = the azimuthal acceleration which appears in a non-uniform rotating reference frame in which there is variation in the angular velocity of the reference point .Time t does not interfere with the calculations in the motionless frame. i.e. The conjugation operation (The Action of ž on ū) is a constant rotational Kinetic–energy (E), which is mapped out, by the nib of vector ϖ, as the Inertia ellipsoid in space which instantaneously rotates around vector axis ϖ (the composition of all rotations) with the constant polar distance ϖ.L / |L| and the constant angles θs, θb, traced on Space cone and on Body cone which are rolling around the common axis of ϖ vector. and if the three components of E are on a cuboid with dimensions a,b,c then (Action of ž on any ū) corresponds to the composition of all rotations only, by the rotation of unit vector axis ū(0,u),by keeping a unit cuboid held fixed at one point of it, and rotating it,θ, about the long diagonal of unit cuboid through the fixed point (the directional axis of the cuboid on ū). Applying the fundamental equations on two points of stationary [PNS] , zo = [λ,±Λ∇i] , z̄'o = [$λ^2$- $|Λ|^2$], Eo = [-λ∇,∇xΛ] = 0 then → e = ∇xΛ = ∇©Λ = [- divΛ¯, curl Λ¯] = [0, ± Λ] i.e. the points are incorporating the equilibrium vorticity ± Λ either as even or odd functions .Since z̄o = [λ, ±Λ∇i], then positive z̄o = [λ, Λ∇i] and z̄'o = [λ,-Λ∇i] is the conjugate quaternion and because z̄o is a unit quaternion then Action on point is → A = New quaternion z = z̄o© ō = z̄o. ō. z̄'o = [λ , Λ∇i].[0, Λ∇i]. [λ,-Λ∇i] = [$-Λ^2$, λΛ +ΛxΛ].[λ,-Λ]= [0, ($λ^2$-$Λ^2$).Λ + 2Λ(ΛΛ) + 2λ(ΛxΛ)]. Since divΛ = 0 = |Λ|.divΛ¯ +Λ¯. ∇|Λ| = |Λ |.divΛ¯ +Λ¯. d|Λ|/ds then Λ¯.∇ = d/ds ,which is the arc-length derivative of Λ direction showing that on points exists directional vorticity as , ($λ^2$-$Λ^2$).Λ = Euler vorticity ↺ which is a Positive Scalar magnitude 2 Λ(ΛΛ) = Coriolis vorticity ↻ which is a Negative Scalar magnitude 2λ.(ΛxΛ) = Centripetal vorticity ↻↺ is a Vector magnitude and for v̄ ⊥ Λ then z = [0, Λ.cosθ + (v̄xΛ).sinθ] which is the Euler-Rodrigues formula for the rotation by an angle θ, of

the vector Λ about its unit normal v̄. Conjugation of ō on point P is G → [0, Λ] © [r + r̄.i] =- |Λ|.|r̄|, rΛ + Λxr̄ and for Λ ⊥ r̄ which is velocity v̄ then G = [0, v. Λ¯ + Λxv̄] and the normalized quaternion is then G ' = [-|Λ|.|v̄|, vΛ +Λxv̄] / (Λv √3), which is Gravity as said of Spaces, i.e. A Potentially Rotational kinetic energy ($mr.w^2$) as above without invoking laws of mechanics.

3. Extremum Principle or Extrema

All Principles are holding on any Point A.
For two points A, B not coinciding, exists Principle of Inequality which consists another quality.
Any two Points exist in their Position under one Principle Equality and Stability, In Virtual displacement which presupposes Work in a Restrain System. [11] . This Equilibrium presupposes homogenous Space and Symmetrical Anti-Space. For two points A, B which coincide, exists Principle of Superposition which is a Steady State containing Extrema for each point separately.
Extrema, for a point A is the Point, for a straight line the infinite points on line, either these coincide or not or these are in infinite, and for a Plane the infinite lines and points with all combinations and Symmetrical ones which are all monads, i.e. all Properties of Euclidean geometry, compactly exist in Extrema Points, Lines, Planes, circles, following geometrical logic and moulds. Since Extrema is holding on Points, lines, Surfaces etc, therefore all their compact Properties (Principles of Equality, Arithmetic and Scalar, the Geometric and Vectors, Proportionality, Qualitative, Quantities, Inequality, Perspectivity etc), exist in a common context as different monads.
Since a quantity (a monad AB) is either a vector or a scalar and by their distinct definitions are,
Scalars ----- [s], are quantities that are fully described by a magnitude (or numerical value) alone,
Vectors ---- [v̄.∇], are quantities that are fully described by both magnitude and a direction, Quaternion [ŝd = s+v ¯.∇i] is a vector with two components, the one s, is the only space with Scalar Potential (any field Φo), which is only half lengths of Space Anti-Space, (the longitudinal positions), (x) → (-x) straight line connecting Space [S],Anti-Space [AS] in [PNS] and in it exist, the initial Work, Impulse, bounded on points which cannot be created or destroyed which is analogous to the (x) magnitude, and the other one y (is the infinite local curl fields So) due to the Spin which is the intrinsic rotation of the Space and Anti-Space, therefore exists a common Extrema formulation for all monads. In [17-22], The six, triple lines, points was shown that : Extrema of Space is Anti-space, Quaternion z̄'o = $[\lambda, \Lambda\nabla i]^{n}$. Extrema of Plane is Anti-Plane, Quaternion z̄'o= $[\lambda,\Lambda\nabla i]^{n-1}$
Extrema of Line is Anti-Line → 0 ± ∞ (Quaternion z̄'o = $[\lambda, \Lambda\nabla i]^{n-2}$) i.e. a new Monad AB = [s + v̄.∇i] with ,s, as the real part and ,v̄.∇i , again as the Imaginary part. The nature of geometry is such (circular reference) that through this intrinsic mechanism [STPL] to transform Quaternion z̄o to a different quaternion z̃̄`o, as is the causality dilemma of < the chicken or the egg >. Balancing of Space, Anti-Space is obtained by the Biaxial Ellipsoid (σx = σy) which exists as momentum ± Λ in caves of diameter 2r. Recovery body (Stabilizer) of the two opposite magnitudes equilibrium the two Momentums by the collision of the two opposite, ± ṽ, Velocity Monads due to momentum ± Λ∇i. [25-26].

4. The Six Triple points Line

It was proved as a theorem [16] that on any triangle ABC and on circum circle exists one inscribed triangle AE.BE.CE and another one circumscribed Extremes triangle KA.KB.KC such that the Six points of intersection of the six pairs of triple lines are collinear → (3+3).3 = 6x3 = 18 lines (F.4-2)
In Projective geometry, Space points are placed in Plane and in Perspective theory < Points at Infinity > and so thus are extremes points [17]. Extremes points follow Euclidean axioms and it is another way of mapping and not a new geometry contradicting the Euclidean. It was also shown that Projective geometry

is an Extrema in Euclidean geometry and [STPL] their boundaries. In case of Orthogonal system (angle A = 90°) then the inscribed triangle AE.BE.CE is in circle and the Extrema triangle KA.KB.KC has the two sides perpendicular to diameter BC and the third vertices in ∞ so any non orthogonal transformational system on an constant vector Ā B, which is the orthogonal system, is happening on the supplementary of θ angle i.e. (90-θ) where then on AB exists → cscθ = constant and equal to ± [1/√1-cos²(90-θ)] = ± [1/ √1 - (BA/ BDB)²] which is identified for say AB = ṽ to Lorentz factor γ = ± [1/√1-β²] where β = v/c, i.e
cscθ = constant = ± [1/ √1 - (BA/BDB)²], and it is the geometrical interpretation of Projective geometry as an Extrema in Euclidean geometry.

In Projective geometry, Space points are placed in Plane and in Perspective theory < Points at Infinity > and so thus are extrema points [18]. Extrema points follow Euclidean axioms either by translation geometry [s,0] or by rotation [0,v̄.∇i] or both [s,v̄.∇i],where s = scalar and v̄.∇i = vector

The Projective sphere comprehending great circles of the sphere as <lines> and pairs of antipodal points as <points> does not follow Euclidean axioms 1 - 4, because <points at Infinity > must follow 1-4, which do not accept lines, planes, spaces at infinity. The same also applies for Hyperbolic geometry with omega point.

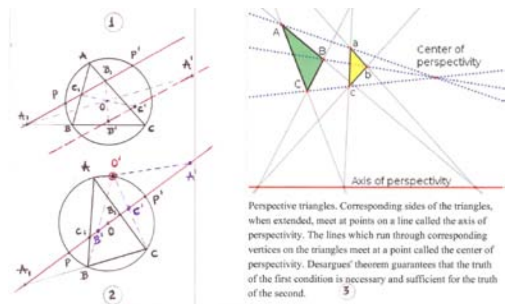
Since Natural logarithm of any complex number b, can be defined by any natural and real number as the power ,w, which represent the mapping to which a constant say e, would have to be raised to equal b, i.e. e^{W}= b and or e^ln(b) = e, [base e]^ ^{1} natural number w^{l} = b, therefore, represent mapping which is the regular polygonal exponentiation of unit complex monad ĀB = 1 on base , e, of natural logarithms.

Using the generally valued equation of universe for zero work W = ds.© = ∫ A-B [P.ds] = 0 , [20] for primary Space and anti-Space on monad ĀB with the only two quantized quantities dš = |ĀB| and P = v̄.∇i, then work is the action of the consecutive small displacements (shifts) along the unit circle caused by the application of infinitesimal rotations of AB = 1 starting at 1 and continuing through the total length of the arc connecting 1 and -1, in complex plane.

5. Perspectivity

In Projective geometry, (Desargues` theorem), two triangles are in perspective axially , if and only if they are in perspective centrally. Show that, Projective geometry is an Extrema in Euclidean geometry.

In [15] was defined the origin of the Non-Euclidean geometries and the relation to Euclidean . F (5) →



F (5-1) F (5-2) F (5-3)

a..Two points P, P′ on circum circle of triangle ABC, form Extrema on line PP′. Symmetrical axis for the two points is the mid-perpendicular of PP′ which passes through the centre O of the circle therefore Properties of axis PP′ are transferred on the Symmetrical axis in rapport with the center O (central symmetry), i.e. the three points of intersection A1,B,C1 are Symmetrically placed as A′,B′,C ′ on this Parallel axis. F (5-1).

b.. In case points P, P′ are on any diameter of the circum circle F(5-2), then line PP′ coincides with the parallel axis, the points A′, B′, C′ are Symmetric in rapport with center O, and the Perspective lines AA′, BB′, CC′ are concurrent in a point O′ situated on the circle. When a pair of lines of the two triangles (ABC, abc) are parallel F(5-3), where the point of intersection recedes to infinity, axis PP′ passes through the circum centers of the two triangles,(Maxima) and is not needed to complete the Euclidean plane to a projective plane. i.e. Perspective lines of two Symmetric triangles in a circle, on the diameters and through the vertices of corresponding triangles concurrent in a point on circle.

c.. When all pairs of lines of two triangles are parallel, equal triangles, then points of intersection recede to infinity, and axis PP` passes through the circum centers of the two triangles (Extremes) .

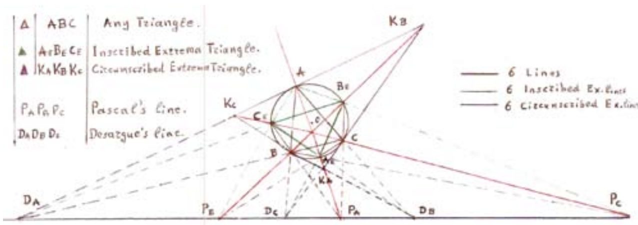
d.. When second triangle is a point P then axis PP′ passes through the circum –centre of the triangle.

Now is shown that Perspectivity exists between a triangle ABC, a line PP′ and any point P where then exists Extrema, (a very useful property of Spaces), i.e. Perspectivity in a Plane is transferred on line and from line to Point. This is the compact logic in Euclidean geometry which holds in all Extreme Points that is suitable for Common Circle of the equilibrium Momentum ± Λ∇i of Spaces . [27]

Any Segment AB between two points A, B consist a Vector described by the magnitude AB and directions ÃB, BÃ and in case of Superposition ÃA, AÃ. i.e. Properties of Vectors, Proportionality, Symmetry, etc exists either on edges A,B or on segment AB as follows

5.1 Theorem

On any triangle ABC and the circum-circle exists one inscribed triangle AE.BE.CE and another one circumscribed Extrema triangle KA.KB.KC such that the Six points of intersection of the six pairs of triple lines are collinear. → (3+3). 3 = 6x3 = 18



The Six Triple Points Line → The Six, Triple Concurrency Points , Line → [STPL].F (5-1.1)

It has been proved [14] that since Perspective lines, on Extremes Triangles AE.BE.CE ,KA.KB.KC concurrent, and since also Vertices A, B, C of triangle ABC lie on sides of triangle KA,KB,KC, therefore all corresponding lines of the three triangles, when extended concurrent, and so the three triangles are Perspective between them i.e.

This compact logic of the nine points [A, B, C], [AE, BE, CE] , [KA, KB, KC] of the inscribed circle (O, ABC) when is applied on the three lines KA.KB, KA.KC, KB.KC, THEN THE SIX pairs of the corresponding lines which extended are concurrent at points PA, PB, PC for the Triple pairs of lines [A.AE,B.CE,C.BE]B.BE,C.AE,ACE[C.CE,A.BE,BAE] and at points DA, DB, DC for the other Triple pairs of lines [CB,KB.A,BE.CE][AC,KA.B,CE.AE][BA,KB.C, AE.BE], and lie on a straight line, and in case of points A,B,C being on a sphere then [STPL] becomes a cylinder which is the twin black holes of galaxies .

5.2 Conclusion

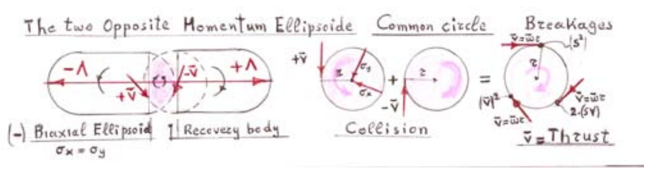
1. [STPL] is a Geometrical Mechanism that produces all Spaces, Anti-Spaces in a Common Sub-Space.

2. Points A ,B ,C and lines AB,AC,BC of Space, communicate with the corresponding AE,BE,CE and AE.BE, AE.CE , BE.CE of Anti-Space, separately or together with bands of three lines at points PA,PB,PC, and with bands of four lines at points DA,DB,DC on common circumscribed circle (O , OA) Sub-Space.

3. If any monad AB (quaternion), [s, v̄.∇i], all or parts of it, somewhere exists at points A,B,C or at segments AB, AC, BC then [STPL] line or lines, is the Geometrical expression of the Action of External triangle KA.KB.KC, the tangents, on the two Extreme triangles ABC and AE.BE.CE (of Space Anti-space).

6. The Method

THE BALANCING OF SPACE → ANTI-SPACE, IN SUB.SPACE COMMON - CIRCLE F(6-1) →



↺ ↻ ↻↺ → ↺↺

Equilibrium vorticity ±Λ (Rotating energy) ↺ ↻
Collision on common circle [CC] ↻ ↺
Thrust on Breakages …F(6-1)… ↺ ↺

The work W, for infinite points on the two tangential to n planes is equal to $W = [\ n.P\ ] = [\ \lambda.\Lambda]$ where

λ. = displacement of A to B and it is a scalar magnitude called wavelength of dipole AB.

Λ = the amount of rotation on dipole AB (this is angular momentum $\tilde{L}$ and it is a vector).

Momentum $\pm\ \Lambda = r.m.v = rm.wr = mr^2.w$, where w is the angular velocity (spin) which maps velocity vector $\bar{v}$ on the perpendicular to $\pm\ \Lambda$ plane with the two components $\bar{v}\ E \perp \bar{v}\ B$.Tangential velocity $\bar{v}\ E = wr$ is a quaternion $\bar{v}\ E = w.r = \bar{z} = [\ s + \bar{v}.\nabla i\ ]$ where $s = |\bar{v}\ E| = |r.w|$ and $\bar{v}.\nabla i = |\bar{w} x \bar{r}|$.

In a spherical cave the Biaxial Ellipsoid ($\boldsymbol{\sigma}x = \boldsymbol{\sigma}y$) exists as momentum + Λ on caves of diameter 2r with parallel circles $\rightarrow 0$.The Biaxial Anti-Ellipsoid ($-\boldsymbol{\sigma}x = -\boldsymbol{\sigma}y$) exists as equal and opposite momentum - Λ on the same diameter 2r with anti - parallel circles $\rightarrow 0$. Equilibrium of the two Ellipsoids ± Λ, presupposes a Stabilizer system attached to Ellipsoids such that opposite Momentum is distributed to the **Center of Mass** of the total system and, recover equilibrium, which is the center of the spherical cave.

The Biaxial Ellipsoid and Anti-Ellipsoid are inversely directed and rotated in the same circle, so the two velocity vectors collide. This collision of the two opposite velocity vectors is the Action (Thrust) of the two quaternion and it is,

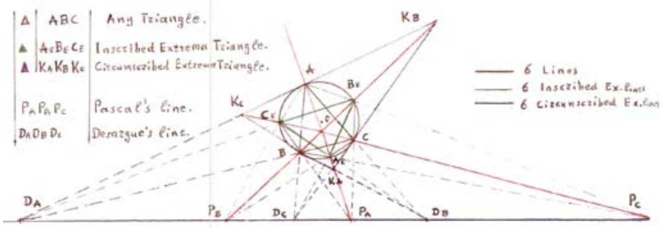
Action of quaternions $(s + \bar{\mathbf{v}}.\nabla i)(©)(s + \bar{\mathbf{v}}.\nabla i) =$

$[s+\bar{\mathbf{v}}.\nabla i]^2 = s^2+|\bar{\mathbf{v}}|^2.\nabla i^2 + 2|s|.|\bar{v}|.\nabla i = s^2 - |\bar{\mathbf{v}}|^2 + 2|s|.|\bar{w}r|.\nabla i = s^2 - |\bar{\mathbf{v}}|^2 + [2\bar{w}].|s|\ |r|.\nabla i$ where,

$\mathbf{s^2 = (r.w)^2}$ → is the real part of the new quaternion, with ½,3/2 spin, and $- |\bar{\mathbf{v}}|^2 = |\bar{w}\mathbf{x}\bar{r}|^2 = \mathbf{- (r.w)^2}$ → the always negative Anti--space (a vector ⊥ to w,r plane),

$[2\bar{w}].|s|.|\bar{r}.\nabla i = 2w.(sr).\nabla i = \mathbf{2.(r.w)^2}$ → the double angular velocity term giving 1,3 spin .

i.e. In the recovery equilibrium (maybe a surface cylinder with 2r diameter), and because velocity vector is on the circumference, the infinite breakages Identify with points A,B,C (of the extreme triangles ABC of Space ABC) and with points AE, BE, CE (of the extreme triangles AE.BE.CE of Anti-Space) all, on the same circumference of the prior formulation and are rotated with the same angular velocity vector $\tilde{\mathbf{w}}$. The inversely directionally rotated Energy ± **Λ** equilibrium into the common circle, so Spaces and Anti-Spaces meet in this circle which is the common Sub-space. Extreme Spaces (the Extreme triangles ABC) meet Anti-Spaces (the Extreme triangles AE.BE.CE), through the only Gateway which is the Plane Geometrical Formulation Mechanism (mould) of the [STPL] line , or cylinder of galaxies . F(6-2) →



Index : DA → PA = x axis, A ⊥ (DA→PA) = y axis, Positive vorticity ↺ + ↑, Negative vorticity ↻ -↓
F(6-2)

Thrust ($\bar{v} = \bar{w}.r$) continually acting on the Breakages $[s^2, - |\bar{\mathbf{v}}|^2, [2\bar{w}].|s|\ |r| = 2(\bar{w}.r)^2]$ produces the [1-1 +2]. $\bar{w}^3.|\bar{r}|^3$ magnitudes $\mathbf{(w.r)^3}$, which is a Positive Scalar magnitude, with Positive or zero electric charge and with, ½ or 1, spin and as for,

1.. Breakage $(w.r)^2$ being on Points A, AE, collide with vector $\bar{v} = \bar{w}r$ and then are getting off the common circle at point DA, PA forming Leptons → **ve , e** and Quarks → **u , d**

2.. Breakage $(w.r)^2$ being on Points B, BE, collide with vector $\bar{v} = \bar{w}r$ and then are getting off the common circle at point DB, PB forming Leptons → **vμ , μ** and Quarks → **c , s**

3.. Breakage $(w.r)^2$ being on Points C, CE, collide with vector $\bar{v} = \bar{w}r$ and then are getting off the common circle at point DC, PC forming Leptons → **vτ , τ** and Quarks → **t , b**

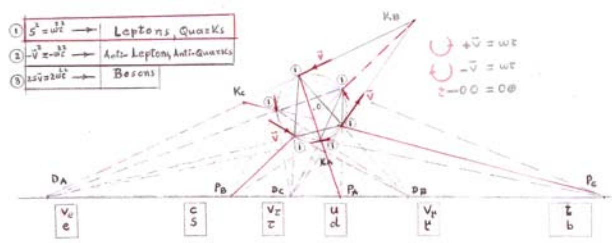
$-|\bar{w}\mathbf{x}\bar{r}|^2 = \mathbf{- (w.r)^2}$, is a Negative Scalar magnitude with Negative or zero electric charge and spin ½ is , 1.. Breakage - $(w.r)^2$ being on Points A, AE, collide with vector $\bar{v} = \bar{w}r$ and then are getting off the common circle at point DA , PA forming Anti - -Leptons → **$\bar{v}e$, $\bar{e}$** and Anti-Quarks → **$\bar{u}$, $\bar{d}$**

2.. Breakage $(w.r)^2$ being on Points B, BE, collide with vector $\bar{v} = \bar{w}r$ and then are getting off the common circle at point DB, PB forming Anti-Leptons → **$\bar{v}\mu$, $\bar{\mu}$** and Anti-Quarks → **$\bar{c}$, $\bar{s}$**

3.. Breakage $(w.r)^2$ being on Points C, CE, collide with vector $\bar{v} = \bar{w}r$ and then are getting off the common circle at point DC, PC forming Anti-Leptons → **$\bar{v}\tau$, $\bar{\tau}$** and Anti-Quarks → **$\bar{t}$, $\bar{b}$**

$2|sr|.\bar{w} = 2(\bar{w}r)^2$, is a Vector magnitude with Positive or Zero or Negative electric charge, spin $(2w) = 1$

1.. Breakage $2|sr|.\bar{w}$, being on Points A,AE, collide with vector $\bar{v} = \bar{w}r$ and then are getting off the common circle at point DA,PA forming → Gluons **g ,W^+** Bosons the **W^+** particle and the **W^-** , **$\bar{g}$R ,** Anti particles . 2.. Breakage $2|sr|.\bar{w}$, being on Points B,BE, collide with vector $\bar{v} = \bar{w}r$ and then are getting off the common circle at point DB , PB forming → Gluons **g , Z^+** Bosons the **Z^+** particle and the **Z^-** , **$\bar{g}$G ,** Anti-particles **.** 3.. Breakage $2|sr|.\bar{w}$, being on Points C, CE, collide with vector $\bar{v} = \bar{w}r$ and then are getting off the common circle at point DC, PC forming → Gluons **g , H^+** Bosons the **H**+ particle and the **H^-**, **$\bar{g}$B,** Anti-particles . 4.. Breakage $2.(r.w)^2$ on Points A,B,C, and on points AE,BE,CE then on PA,PB,PC → the Photons **γ** ,Graviton **$G^{\pm}$, $M^{\pm}$,** Bosons the **γ ,G,M** particles and the **, $\bar{\gamma}$,$\bar{G}$, $\bar{M}$** Anti particles. F[6-2.1]



The [STPL] line→ producing the 6 Leptons and the 6 Quarks F[6-2.1]

1. Positive breakage Quantity $s^2 = (r.w)^2$ → Being at Space points A, B, C and of v = wr then Action magnitudes Q at coinciding points DA , DB , DC - PA,PB,PC produces **Leptons** and **Quarks** with ½ spin and carry them on [STPL] line.

QDA = $|A|.|s^2| = |r.w|.(r.w)^2 = (r.w)^3$. [cos(A,DA) + cos(B,DA) + cos(C,DA)] → **ve**

$s^2 = (r.w)^2$ → Being at Anti-Space points AE,BE, CE then Action magnitudes Q at coinciding points DA, DB, DC are **QDA** = $|A|.|s^2| = |r.w|.(r.w)^2 = (r.w)^3$. [cos(AE,DA) + cos(BE,DA + cos(CE,DA)] → **e**

$s^2 = (r.w)^2$ → Being at Space and Anti-Space points A,B,C and AE,BE,CE then Anti magnitudes Q' at coinciding points PA, PB, PC are **Q'PA** = $|A|.|s^2| = |r.w|.(r.w)^2 = (r.w)^3$. [- cos(A,PA) - cos(B,PA) + cos(C,PA)] → **u**

Q'PA = $|A|.|s^2| = |r.w|.(r.w)^2 = (r.w)^3$. [-cos(AE,PA) + cos(BE,PA - cos(CE,PA)] → **d**

QDB = $|B|.|s^2| = |r.w|.(r.w)^2 = (r.w)^3$.[- cos(A,DB) - cos(B,DB) - cos(C,DB)] → **vμ**

$s^2 = (r.w)^2$ → Being at Anti-Space points AE,BE, CE then Action magnitudes Q at coinciding points DA, DB, DC are,

QDB = $|B|.|s^2| = |r.w|.(r.w)^2 = (r.w)^3$. [- cos(AE,DB) - cos(BE,DB - cos(CE,DB)] → **μ**

$s^2 = (r.w)^2$ → Being at Space and Anti-Space points A, B, C and AE, BE,CE then Anti magnitudes Q' at coinciding points PA, PB, PC are

Q'PB = $|B|.|s^2| = |r.w|.(r.w)^2 = (r.w)^3$. [cos(A,PB) + cos(B,PB) + cos(C,PB)] → **c**

Q'PB = $|B|.|s^2| = |r.w|.(r.w)^2 = (r.w)^3$. [cos(AE,PB) + cos(BE,DB + cos(CE,DB)] → **s**

QDC = $|C|.|s^2| = |r.w|.(r.w)^2 = (r.w)^3$. [cos(A,DC) + cos(B,DC) + cos(C,DC)] → **vτ**

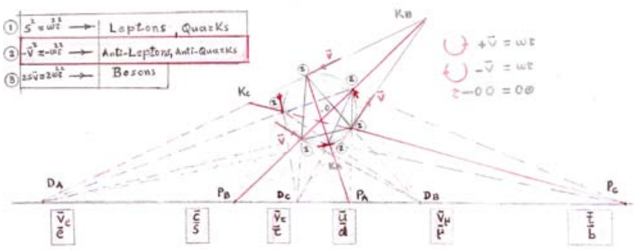
$s^2 = (r.w)^2$→ Being at Anti -Space points AE,BE,CE then Action magnitudes Q at coinciding points DA, DB, DC are

QDC = $|C|.|s^2| = |r.w|.(r.w)^2 = (r.w)^3$. [cos(AE,DC) + cos(BE,DC - cos(CE,DC)] → **τ**

$s^2 = (r.w)^2$ → Being at Space and Anti-Space points A,B,C and AE,BE,CE then Anti magnitudes Q' at coinsiding points PA, PB, PC are

Q'PC = $|C|.|s^2| = |r.w|.(r.w)^2 = (r.w)^3$. [- cos(A,PC) - cos(B,PC) - cos(C,PC)] → **t**

Q'PC = |C|.|s²| = |r.w|.(r.w)² = (r.w)³. [-cos(AE,PC) - - cos(BE,PC) - cos(CE,PC)] → **b**



The [STPL] line → producing 6 Anti-Leptons and 6 Anti-Quarks F[6-2.2]

2. Negative breakage Quantity -|v̄| ² = - |w̄xr̄| ²= - |w̄.r|² → Being at Space points A,B,C then Action magnitudes Q at coinciding points DA,DB,DC - PA,PB,PC

Produces **Anti-Leptons** and **Anti-Quarks,** and carry them on [STPL] line.

QDA = |A|.|s²| = |r.w|.(r.w)² = **-** (r.w)³. [cos(A,DA) + cos(B,DA) + cos(C,DA)] → **ν̄e**

s² = (r.w)² → Being at Anti-Space points AE,BE, CE then Action magnitudes Q at coinciding points DA,DB,DC are

QDA = |A|.|s²| = |r.w|.(r.w)² = **-** (r.w)³. [cos(AE,DA) + cos(BE,DA + cos(CE,DA)] → **ē**

s² = (r.w)² → Being at Space and Anti-Space points A,B,C and AE,BE,CE then Anti magnitudes Q' at coinsiding points PA, PB, PC are

Q'PA = |A|.|s²| = |r.w|.(r.w)² = **-** (r.w)³. [- cos(A,PA) - cos(B,PA) + cos(C,PA)] → **ū**

Q'PA = |A|.|s²| = |r.w|.(r.w)² = **-** (r.w)³. [-cos(AE,PA) + cos(BE,PA - cos(CE,PA)] → **d̄**

QDB = |B|.|s²| = |r.w|.(r.w)² = **-** (r.w)³. [- cos(A,DB) - cos(B,DB) - cos(C,DB)] → **ν̄μ**

s² = (r.w)² → Being at Anti-Space points AE,BE,CE then Action magnitudes Q at coinciding points DA,DB,DC are

QDB = |B|.|s²| = |r.w|.(r.w)² = **-** (r.w)³. [- cos(AE,DB) - cos(BE,DB - cos(CE,DB)] → **μ̄**

s² = (r.w)² → Being at Space and Anti-Space points A,B,C and AE,BE,CE then Anti magnitudes Q' at coinsiding points PA, PB, PC are

Q'PB = |B|.|s²| = |r.w|.(r.w)² = **-** (r.w)³. [cos(A,PB) + cos(B,PB) + cos(C,PB)] → **c̄**

Q'PB = |B|.|s²| = |r.w|.(r.w)² = **-** (r.w)³. [cos(AE,PB) + cos(BE,DB + cos(CE,DB)] → **s̄**

QDC = |C|.|s²| = |r.w|.(r.w)² = **-** (r.w)³. [cos(A,DC) + cos(B,DC) + cos(C,DC)] → **ν̄τ**

s² = (r.w)²→ Being at Anti **-**Space points AE,BE,CE then Action magnitudes Q at coinciding points DA,DB, DC are

QDC = |C|.|s²| = |r.w|.(r.w)² = **-** (r.w)³. [cos(AE,DC) + cos(BE,DC - cos(CE,DC)] → **τ̄**

s² = (r.w)² → Being at Space and Anti-Space points A,B,C and AE,BE,CE then Anti magnitudes Q' at coinsiding points PA, PB, PC are

Q'PC = |C|.|s²| = |r.w|.(r.w)² = **-** (r.w)³. [- cos(A,PC) - cos(B,PC) - cos(C,PC)] → **t̄**

Q'PC = |C|.|s²| = |r.w|.(r.w)² = **-** (r.w)³. [- cos(AE,PC) - cos(BE,PC) - cos(CE,PC)] → **b̄**

Spin ½ :

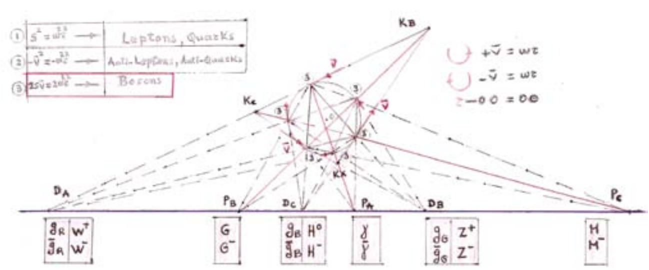
Spin S = h/2π = 6,626.10 $^{-34}$ Js $^{-1}$/2π = 1,05459. 10 $^{-34}$ Js $^{-1}$ = 6,5822.10 $^{-16}$ eVs $^{-1}$ and it is the Energy of a Photon in Planck`s cave .

Quantity **|w̄.r|²=½** Spin, is equal to 6,5822.10 $^{-16}$ eVs $^{-1}$ where then w.r = √ 6,5822.10 $^{-16}$ = 2,5656.10 $^{-8}$ eVs.

Angular velocity in Gravity cave w = 2,5656.10 $^{-8}$ eVs $^{-1}$ / 1,9845.10 $^{-62}$ m w = 2,58564.10 ^{54} eV/ m while in Planck`s cave w = 2,5656.10 $^{-8}$ /1,24.10 $^{-19}$ eV/m / J/m / 8,906.10 $^{-35}$ = 3,572.10 ^{44} H .

Energy is equal to the velocity vector |v̄| = |w̄|r, or E = |w.rG| = 2,5656.10 $^{-8}$ eVs = 2,5656.10 $^{-27}$ Js.

Breakage Quantity [2w̄].|s|.|r̄.∇i = 2(wr)².∇ F[6-2.3]



The [STPL] line → producing Strong Gluon (g) Electromagnetic(γ) →Weak ($W^{\pm}$, $Z^{\pm}$, $H^{\pm}$) Bosons

3. Breakage Quantity [2w̄].|s|.|r̄.∇i = 2w.(sr).∇i = 2w.(r^2.w).∇i = 2w.r^2w.∇i → Being Tangential at Space points A,B,C and Axial at Space Anti-Space points AAE,BBE,CCE, then Action magnitudes FA at coinsiding points DA, DB, DC and PA, PB, PC produces Forces with spin 1 (because of 2w) on [STPL] which transfer Energy (Thrust) on Leptons and Quarks.

a. Breakages on Points A,B,C and on points AE,BE,CE then on [DA], DB**,** DC → the Gluons **g** and [$W^{\pm}$], $Z^{\pm}$, $H^{\pm}$ Bosons the **W** $^{+}$, particle and the **W** $^{-}$, **ḡR** , Anti particles .

QDA = |A|.2|wr|² = |r.w|.2.(rw) ² = 2.(r^3.w^3). [cos(A,DA)] → **gR**

2.(r^3.w^3) → Being at Anti-Space point AE then Action magnitudes Q at coinciding point DA is

QDA = |A| . 2|wr|² = |r.w|. 2. (r^2.w^2) = 2.(r^3.w^3).

.[cos(AE,DA)] → **ḡR**

2.(r^3.w^3) → Being at Space and Anti-Space points B,C and BE,CE then Anti magnitudes Q' at coinsiding point DA is

QDA = |BC|.2|wr|² = |r.w|.2.(r^2.w^2) = 2.(r^3.w^3) .

[cos(BC,DA) . sin(BC,DA)] → **W** $^{+}$

QDA = |BE,CE|.2|wr|² = |r.w|.2.(r^2.w^2) = 2.(r^3.w^3).

.[cos(BE,CE.DA) .sin(BE,CE,DA)] → **W** $^{-}$

b. Breakages on Points A,B,C and on points AE,BE,CE then on DA, [DB], DC → the Gluons **g** and $W^{\pm}$, [$Z^{\pm}$], $H^{\pm}$ Bosons the **Z** $^{+}$**,** particle and the **Z** $^{-}$, **ḡG** , Anti particles .

QDB = |B|.2|wr|² = |r.w|.2.(rw)² = 2.(r^3.w^3) .

[cos(B,DB)] → **gG**

2.(r^3.w^3) → Being at Anti-Space point BE then Action magnitudes Q at coinsiding points DB is

QDB = |B|.2|wr|² = |r.w|.2.(rw)² = 2.(r^3.w^3). [cos(BE,DB)] → **ḡG**

2.(r^3.w^3) → Being at Space and Anti-Space points A,C and AE,CE then magnitudes Q' at coinsiding point DB is QDB = |AC|.2|wr|² = |r.w|.2.(rw)² = 2.(r^3.w^3).

[cos(AC,DB)] → **Z** $^{+}$

QDB = |AE,CE|.2|wr|² = |r.w|.2.(rw)² = 2.(r^3.w^3). [cos(AE.CE,DB).sin(AE.CE,DB)] → **Z** $^{-}$

c. Breakages on Points A,B,C and on points AE,BE,CE then on DA, DB, [DC] → the Gluon **g** and $W^{\pm}$, $Z^{\pm}$, [$H^{\pm}$] Bosons the **H** $^{+}$, particle and the **H** $^{-}$, **gB** , Anti particles.

QDC = |C|.2|wr|² = |r.w|.2.(rw)² = 2.(r^3.w^3). [cos(C,DC)] → **gB**

2.(r^3.w^3) → Being at Anti-Space point CE then Action magnitudes Q at coinsiding point DC is

QDC = |C|.2|wr|² = |r.w|.2.(rw)² = 2.(r^3.w^3) . [- cos(CE,DC)] → **ḡB** .

2.(r^3.w^3) → Being at Space and Anti-Space points A,B and AE,BE then magnitudes Q at coinsiding point DC is QDC = |BA|.2|wr|² = |r.w|.2.(rw)² = 2.(r^3.w^3) .

[- cos(BA,DC)sin(BA,DC)] → **H** $^{+}$

QDC = |AE,BE|.2|wr|² = |r.w|.2.(rw)² = 2.(r^3.w^3). [cos(AE.BE,DC) .sin(AE.BE,DC)] → **H** $^{-}$

d. Breakages on Points A,B,C and on points AE,BE,CE then on PA, PB, PC → the Photons **γ** Graviton $G^{\pm}$, $M^{\pm}$, Bosons the **γ , G , M** , particles and the **γ̄ , G̅, M** Anti particles .

Q\`PA = |B,CE,PA|.2|wr|² = |r.w|.2.(rw)² = 2.(r^3.w^3).

[- cos(B,CE,PA)] → **γ**

Q\`PA = |C,BE,PA|.2|wr|² = |r.w|.2.(rw)² = 2.(r^3.w^3).

[- cos(C,BE,PA)] → **γ̄**

Q\`PB = |C,AE,PB|.2|wr|² = |r.w|.2.(rw)² = 2.(r^3.w^3).

[cos(A,CE,PB)] → **G**

Q\`PB = |A,CE,PB|.2|wr|² = |r.w|.2.(rw)² = 2.(r^3.w^3).

[cos(C,AE,PB)] → **G** $^{-}$

Q\`PC = |A,BE,PC|.2|wr|² = |r.w|.2.(rw)² = 2.(r^3.w^3).

[- cos(B,CE,PA)] → **M**

Q\`PC = |B,AE,PC|.2|wr|² = |r.w|.2.(rw)² = 2.(r^3.w^3).

[- cos(B,AE,PC)] → **M** $^{-}$

Where cos(A,DA), cos(AE,DA) = cos of tangents at points A,B,C - AE,BE,CE and the [STPL], (x-x axis).

Spin 1 → 2 x ½ :

½ Spin → S = h/2π = h̄ = $6{,}626.10^{-34}$ Js^{-1}/2π = 1,05459., 10^{-34} Js^{-1} = $6{,}5822.10^{-16}$ eVs^{-1} and it is the Energy of a Photon = |w̄.r|² for the Positive and Negative scalar Breakage magnitudes particles.

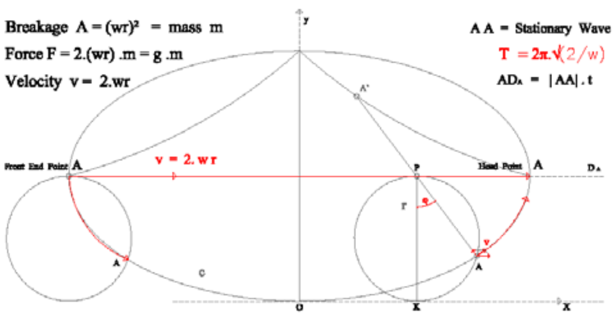
Quantity → 2|w̄.r|² = 2.[|w̄.r|² = ½ Spin] = Spin 1 and equal to 2.[$6{,}5822.10^{-16}$ eVs^{-1}] =$1{,}31644.10^{-16}$ eVs^{-1}.

Spin Anti-Spin is the rotational equilibrium of spaces. Spin is an Intrinsic property of the three Breakage Quantities $6{,}5822.10^{-16}$ eVs^{-1} for Leptons and Quarks **and** double $1{,}31644.10^{-15}$ eVs^{-1} for the Vector Breakage magnitude particles.

Angular velocity $w = 2{,}5656.10^{-8}$ $eVs^{-1}/1{,}9845.10^{-62}$ $m = 2{,}58564.10^{-54}$ eV/m of the rotational energy Λ is a common property of all breakages resulting from the Action of velocity vector,$\bar{v}$, on the breakages.

Energy is equal to the velocity vector $|\bar{v}| = |\bar{w}|r$, or $E = w.rG = 2{,}5656.10^{-8}$ eVs $= 2{,}5656.10^{-27}$ Js.

7.1. Cycloidal motion



The Cycloid motion of material point A→A = |AA|
The Brachistochrone Curve A → A F (7-1.1)

Cycloid is the curve described (traced) by a point on the circumference of a circle of radius ,r, as this rolls along a straight line without slipping . In an orthogonal coordinate system (x,y) the equations of motion are $x = r.(t-\sin t)$, $y = r(1-\cos t)$ where t = time . The area between the curve and the straight line is $A=3\pi r^2$ and the arc length $l = 8r$ .Differential equation of the curve $(dy/dx)^2 = y/(2r-y)$ is also satisfied .Motion on a cycloid is such that , as long as a particle moves under gravity ,g, then the total period of osccillation is $T= 4\pi\sqrt{r/g}$ which does not depend on speed of rolling , (Huygens cycloid pendulum) . The arc length $l=8r$ is completed for faster , as one revolution in less time than the slower one , meaning that , On cycloid all points of y axis reach x-x axis at the same time , regardless of the height from which they begin (isochrone) .This property is used for breakages to reach STPL line isochrone. Evolute also of a cycloid is a cycloid itself ,(apart from coordinate shift). Velocity vector of a motion is directed along the tangent and is the sum of the velocity vectors of the constituent motion, thus at each point of a cycloid , the line joining that point , to the point that circle is , then at the top of the generative circle is tangent to the cycloid and the line joining point that is to that of bottom (circle) is normal to the cycloid . Evolute of a cycloid is *balancing cycloid* [5] .

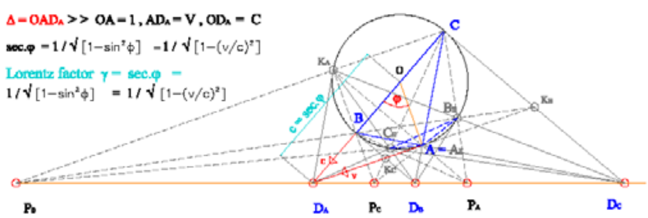
For trajectory element $ds^2 = dx^2+dy^2$ and $ds = \sqrt{2r/y}.dy$ and $s = 2.\sqrt{2ry} + C$ and with a coordinate system (y=0,s=0) then $C= 0$ and $s= 2\sqrt{2ry}= 4r.\sin\varphi$ (F7-1.1)

Since velocity $\bar{v}$ is tangent to the point then component $\bar{v}.\sin\varphi$ is $\sin\varphi = s/4r$ and then equation of motion ***becomes*** $\rightarrow [ds^2 / dt^2] =$ **-** $(g/4r).s$ ***which is a harmonic oscillation with total time period*** $T = 4\pi\sqrt{r/g}$ which is independent of any amplitude (Displacement , Energy). i.e. On cycloid , all moving points on y axis reach x-x axis at the same time (isochrone motion) regardless of the height from which they begin (they do not depend on the oscillation amplitudes) , **or if** , *a particle of mass* $m=(wr)^2$ *tied to a fix point* A *executes a Simple harmonic motion under the action (Thrust) of tangential velocity* $v= w\bar{r}$, and since $\rightarrow$ Force = Velocity x Breakage $v.Br = (wr).2(wr)^2 = 2(wr= g).[(wr)^2= m] = 2.g.m$, then it follows a cycloidal trajectory with a ***Total time period*** $\mathbf{T = 4\pi \sqrt{(r/2wr)}= 2\pi \sqrt{(2/w)}}$ ***which is dependent on angular velocity only and it is the Spin of particle* |AA|.** **This property is used to show that the norm $|\bar{v}|$, of vectors $\bar{v}$ is , *a Stationary wave* , with the two edges as nodes and wavelength** $\lambda = 2.|AA|$ **twice the norm.**

This rolling circle has a constant velocity $\bar{v}_r = \sqrt{rg} = \sqrt{r.2wr} = r.\sqrt{2w}$ .Thrust is the velocity vector v=wr on the circumference of common circle of the inversy rotating Space, anti-Space becoming from the rotational energy vector Λ of PNS. The norm of velocity $|\bar{v}|$ is the static equilibrium position vector of amplitude ,ds, of dipole $|AB| =|\bar{v}|= ds$ and in terms of the statical diflection ds then $T = 1/f = 2\pi/w$ where $ds = z = \bar{v}= A.e^{(iwt)} = |\bar{v}|. \cos wt + i.\bar{v}.\sin wt$ **.**

Breakages acquire different velocities and different energy , and because are following cycloid trajectories , thus , need the same time (isochrone) to reach [STPL] line and Poinsot's ellipsoid becomes now a → < Cycloidal ellipsoid > . F (7-1.2)
Breakage quantity 2.(wr)² under the tangential action v = wr becomes 2.(wr)³ acting on point A → 2.wr.m of common circle. The same also for points A,B,C of Space and AE,BE,CE of Anti-Space . Because all velocity vectors AA,BB,CC carry material points A,B,C at points DA,DB,DC in time ,t, isochrone , then material points follow a cycloid with period the norm length of velocities |AA|,|BB|,|CC| .

7.2. Lorentz factor γ



The Geometrical expression of Lorentz factor γ

sec.φ = γ = ODA:ADA = ± 1 / [√1 – (v/c)²] F (7-2.1)

Geometry does not need the meter , ***time*** , to perform any logic because it is the logic . Motion occurs as mould (Tensor) on a geometrical formation , because in motion interferes the meter of time , so material points [real,imaginary] = [x,y,z -∇i = Λ = rmv = r²mw r.m.(s/t)] acquire different meters of time .
Consider O(x,y,z, c = O.DA) being an Absolute Cartesian coordinate system with constant velocity ,**c**, due to the tangential velocity **v** = A.DA of the same system and O'(x',y',z',v') being another one Cartesian coordinate system on [STPL] line direction DA,PA .
Question ?? When and how the two systems keep velocity |O.DA|= constant independently of any changes of velocity ,**v**, of the system ??
A first answer is that the two vectors O.DA,A.DA must have the same edge DA with not any set restrictions. Since OA maybe any cave of rotation , then is considered a unit length (OA=1) and circle (O,OA) as unit circle . In triangle **Δ (**OA.DA) OA=1 A.DA = **v** ,O.DA = **c** and sinφ = (v/c) and O.DA = sec.φ = (cos.φ) $^{-1}$ = ± 1/ (√1 - sin²φ) and sec.φ = ± 1 / [√1 – (v/c)²] = c / [√c² – v²] i.e. velocity O.DA is Constant independently of the position [circle (O,OA) magnitude A.DA and direction→ A.DA of velocity A.DA = v and this mould valides for all points on [STPL] line, so sec.φ is the ,γ, Lorents factor or **sec.φ = γ = ± 1/ [√1 – (v/c)²] = c/[√c² – v²].**
Remarks :
a.. The two velocity vectors c,v coincide at DA point, therefore the meter of their changes is the same and equal to t and O.DA = c , A.DA = v.t , i.e. on constant velocity vector O.DA point O removes from position O to position DA. The same also for point A which removes from position A to DA. This removal is <*Isochrone*> because the two velocity vectors coincide at edge DA , which means that points O,A remove to point DA at the same time(isochrone) , independently of oscillation amplitude on the cycloid.
b.. Following the above logic, vector-quaternion Norm keep it constant by an intrinsic (in the norm) isochrone (harmonic oscillation) on a cycloid independently of amplitudes (displacements or strengths) i.e.
Quaternion → vectors with norm |v| are a Standing wave (stationary wave) which remains in the constant position |v| with the two edges as nodes with wavelength twice the norm and independently of amplitude , and with period T =2π √(2/w) F(7-1.1)
Relative motion of {O},{DA-PA} Systems .
Let ,x, be the coordinate of system O(x,y,z,c) and , x', be the coordinate of DA(x',y',z',v') ,[STPL] system at common point DA . In uper question , O.DA = **c** and A.DA= **v** ,where their relation result to Lorentz factor. The same result should be for both velocities multiplied with an arbitrary number ,t, because sec.φ = γ = (c**t**/vt).
If we call this arbitrary number ,t = time, or something else , or as changes of velocities , or as a conversion factor between conventional time (second) and length units (metr) , then this does not change at all the upper

geometrical logic . For this relative new orientation of spaces O(x,y,z,tc) and DA(x^I,y^I,z^I,$t^I v^I$) of the coordinate systems indicated in F(7-2.1) the problem is solved as follows ,

a.. Material point A of the Fixed System {DA-O} travels with velocity v̄ at point DA , so geometrical distance A.DA *in the* Relative System {DA-PA} is A.DA = x^I+ v̄t^I, and because of the isochrone motion *in the* Fixed System {DA-O} it is x = (x^I+ v̄t^I).γ or

x = (x^I+v̄t^I).γ = [x^I+vt^I] **:** [√1-(v/c)²] ...(.2**a**)

Inversly , using (7-3) where {DA-A} = {DA-0} / γ , then if Material point A of the Fixed System {DA-O} travels with velocity v̄ at point DA , the geometrical distance A.DA *in the* Fixed System {DA-O} is→ A.DA = x - v̄t and *in the* Relative System {DA-PA} is **x**^{1} = (x - vt).γ = [x - vt] **:** [√1-(v/c)²] … (.2**b**)

b.. Conversion factor t=time, between the conventional time units (second) and length units (meter) and because of the isochrone motion of vectors **c**= O,DA and **v**= A,DA then vectors O,DA = c.t and A,DA = v.t^I reach point DA simultaneously. Geometrically means that conversion factor ,t, on ,c, is projected on ,v, and so , t - t.sinφ = t – t(v/c) = (1-v/c).t =(c-v).t/c . From above Question , *proposition such that constant velocity is kept the same in two reference frames ,* valids → c = x/t = x^I/ t^I, and time t = x /c , t' = x' /c or t = (x' + vt') / c.(√1 -(v/c)²) = (x'/c) + (v/c).t' : N = [(t' + (v/c²).x'] : N = [t'+(v/c²)x'] **:** [√1-(v/c)²] …(2**c**)

From relation t' = x' /c = (x-vt).γ/c =[t - (v/c²)x] : N = [t - (v/c²).x] **:** [√1-(v/c)²] …(2**d**)

i.e. equations ,

x = (x^I+vt^I).γ = [x^I + vt^I] **:** [√1-(v/c)²] ..(2a)

t = (x' + vt').γ/c = [t' + (v/c²).x'] **:** [√1-(v/c)²] ..(2c)

y = y^I , z = z^I,

x^1 = (x - vt).γ = [x - vt] **:** [√1-(v/c)²] ..(2b)

t' = (x - vt).γ/c = [t - (v/c²).x] **:** [√1-(v/c)²] ..(2d)

y^I = y , z^I = z ,

are the known equations of Relativity .

c.. For constant velocity c =∞ equations become

x = x^I + v.t^I , y = y^I , z = z^I, t = t^I , and inversy

x^I = x - v.t , y^I= y , z^I = z , t^I= t .

Breakages [(wr)², - |wr ², 2(w̄.r)²] , *being masses off the system* {O} , *under the Action of the constant velocity* ,**c**, *which is not changed* , are multiplied by Lorentz factor γ ,(7-3), where then the new masses are m^I= m.γ =2(wr)²γ= 2(wr)²/[√1-(v/c)²] = 2m/ [√1-(v/c)²]

The embedded energy to Breakages ,*masses*, is as

E = mv²/2= {2m / [√1 -(v/c)²]}. **c**²/2 = m**c**² / [√1-(v/c)²]

which is the known formula of Einstein in GR . [37]

8.1. Photoelasticity

In Photo elasticity, the speed of light (vector v̄) through a Homogenous and Isotropic material, (transparency, outstanding toughness, dimensional stability, mold ability, very low shrink rate, etc.) , varies as a function of the direction and magnitude of the applied or residual stresses.

Light through a Polarizing filter (a Plane cavity of thickness L) blocks spatial components except those in the plane of vibration, and if through a second Plane cavity, then the components of the light wave vibrate in that plane only. Polarized light passing through different Flat caves (stressed material), splits into two wave fronts travelling at different velocities, each parallel to a direction of principal stress but perpendicular to each other. (Birefringence property of stress material with two indices n1, n2 of refraction).The components of the light waves interfere with each other to produce a **colour spectrum** as happens in < common circle > .

[Retardation,δ, (nm) is the phase difference between the two light vectors through the material at different velocities (fast, slow) and divided by the material thickness (L) is proportional to the difference between the two indices of refraction i.e. δ/L = n2 - n1 = C.(σ1-σ2) where σ1, σ2 are the Principal stresses.

Retardation,δ, **determines colour bands or fringes** (A fringe N is each integer multiple of the wavelength) where the areas of lowest orientation and stress appear black followed by gray and white and as Retardation and stress (σ) go up then the colors cycle through a more or less repeating pattern and the Intensity of the colours diminishes (decreases).

Because the colours repeat at different levels of retardation and stress, then is tracked as colour band sequence from the black or white regions and are repeated periodically following the whole fringe of the colors, **as Black, Gray , White-Yellow , Yellow – Orange (dark yellow), Red, Violet** (**1st order fringe**), **Blue, Blue-green, Green-yellow, Yellow,Orange (dark-yellow), Red, Violet (2nd order fringe)** →

In Common circle, with different angular velocity vector, v = w̄ r, in the absence of applied Torques produces a colour Spectrum which is, the Colour Forces → Gluon Red, Gluon Green, Gluon Blue..

Stability is obtained by the opposite momentum – Λ^{-} where E = **-** (v̄xB) = **-** (v̄.B) ⊥ → or and B ⊥ E . The two perpendicular Static force fields E and Static force field B of Space-Anti-Space, experience on any moving dipole A^{-} B = [λ, Λ] with velocity v̄ (momentum Λ^{-} = mv̄ only is exerting the velocity vector v̄ to the dipole λ) a total force **F** = **F** E + **F** B = (λm). **E** + (λm). **v̄** x **B** which combination of the two types result in a helical motion and generally to any Space Configuration (the Continuum) extensive property , as Kinetic (3-current motion) and Potential (the perpendicular Stored curl fields E, B) energy, by displacement (the magnitude of a vector from initial to the subsequent position) and rotation and equation is as [25]. **The Total Energy State of a quaternion** → ET = √ [m.vĒ.²] ² + [Λ.vB + Λ x vB̄] ² = √ [m.vĒ.²]² + E² = √[**m**.v̄E²]² + |√**p**1.v̄B1|² + |√**p**2.v̄B2|² +|√**p**3.v̄B3|² (N10) i.e. a moving Energy cuboid (axbxc), rectangular parallelepiped, with space diagonal length equal to E = √a²+b²+c² where → **a** = |p1.v̄B1 |, **b =** |p2.v̄B2 |, **c =** |p3.v̄B3 | and when **v̄ E = 0** then ET = Λ.v̄B.+ Λ x v̄B → which is the accelerating removing energy Λ towards v̄B **m = 0** then ET = Λ.v̄B + Λ x v̄B → which is the linearly removing energy Λ towards v̄B , and for **v̄ B = 0** then ET = m.v̄E ² → which is the Kinetic energy in Newtonian mechanics towards v̄E.

8.2. Conclusions :

Any moving monad [z = s + v̄] is transformed into →

1. In Elastic material Configuration, **as Strain energy** and is absorbed as Support Reactions and displacement field [∇ε (ū,v̄,w̄)] upon the deformed placement, (where these alterations of shape by pressure or stress is the equilibrium state of the Configuration [26] , and in elasticity ,,

G.∇ ².ε + [m.G / (m-2)]. ∇ [∇. ε] = F) , (Elasticity)

2. In Solid material Configuration, **as Kinetic** (Energy of motion v̄) and Potential (Stored Energy) energy by displacement (the magnitude of a vector from initial to subsequent position) and rotation, on the principal axis (through center of mass of the Solid) as ellipsoid, which is mapped out, by the nib of vector (δr̄c) = [v̄c + w̄.r̄ n] δt, as the Inertia ellipsoid [Poinsot's ellipsoid construction] in (AF) which instantaneously rotates around vector axis w̄,φ with the constant polar distance w̄.Fe / |Fe| and the constant angles θs, θb, traced on, Reference (BF) cone and on (AF) cone, which are rolling around the common axis of w̄ vector without slipping, and if Fe, is the Diagonal of the Energy Cuboid with dimensions a,b,c which follow Pythagoras conservation law, then the three magnitudes (J,E,B) of Energy-state follow Cuboidal (Cycloidal) , Plane, or Linear Diagonal direction, and If Potential Energy is zero,then vector **w̄** is on the surface of the Inertia Ellipsoid . [27-28].

3. In Quaternion Extensive Configuration, as **New Quaternions** (with Scalar and Vector magnitudes). Points in Primary Space [PNS] carry A priori the work W = ∫A-B [P**.**ds] = 0, where magnitudes P, ds̄ can be varied leaving work unaltered. Diffusion (decomposition) of Energy follows Pythagoras conservation law where the three magnitudes (J,E,B) of Energy **-** State follow Cuboidal, Plane, or the Linear Diagonal [18].

4. In Space conserved Extensive property Continuum (Configuration), as **Kinetic (3-current motion)** and **Potential (perpendicular Stored curl fields)** energy by displacement (the magnitude of a vector from initial to the subsequent position) and rotation.

Energy is conserved in E and B curled fields following cycloidal motion of end points .

5. The dynamics of any system = Work = Total energy, is transferred as generalized force Qn as,

Qn = ∂W/∂(δq̄n), (δq̄n) = v̄n.δt = [v̄c + w̄.r̄ n] δt = (Translational + rotational velocity).δt or

Qn = [v̄c. (∂T/δt) + w̄.r̄ n].(∂T/δt) → Translational kinetic energy + Rotational kinetic energy.

6. The ultimate Constituents of Monads (s,v̄) is the real part ,s, which is the Magnitude of Imaginary part, and the Imaginary part which is Vector v̄.

The [STPL] is a Geometrical Mechanism (Mould) which transfers the two Quantities of the breakable monads from one Level (Confinement) to another Level using Quantities or the Breakages of collision between monads .This Mechanism is not the Origin of monads, but it is the Mould (the Regulative Universe Valve) . It was shown that into Gravity cave Lg = 2.r = e^i.(- 9.π/2)b = 3,969.10 ⁻ 62 m , is inversely balancing the Common circle of Space Anti-Space , with velocities [v̄g = wr] that of light ,c, tending to zero . For rotations in cave Lc>Lg then exist velocities [v̄c > c] tending to infinity . The hidden pattern of universe is ,STPL line, which is off the Spaces and connect them (it maintains , conserve and support all universe) , so may say, *it is The Naval Cord (string) of Galaxies*). [33] . i.e.

In Common Circle (the Sub-Space) of rotating Space Anti-Space [± Λ], with maximum angular Velocity Vector, v = w r on circumference, [in the absence of applied Torques and because of the Birefringence property of stress continuum with different indices ,n, of refraction, which creates the Retardation,δ, determining Colour Bands or Fringes] Produces a colour Spectrum which is , the < *Color Forces* > → Gluon Red , Gluon Green , Gluon Blue.

When tangential velocity **v̄ = w r** on circumference of a cave ,**r**, is in another of radius **R > r**, then the new tangential velocity **v̄ = w̄ R** is greater than v̄ and when v̄ is the speed of light , then the new v̄ are velocities greater than that of light . [33]

7. In Black holes Energy scale (**λ. Λ = k 1**) there are infinite high frequency small amplitude vacuum fluctuations at Planck energy density of 10^{113} J/m3 that exert action (pressure) on the moving Spaces dipole and their Stability is always achieved by Anti-space in rotational equilibrium .

8. Dipole vectors are quaternions (versors) of ***waving nature,*** i.e., one wavelength in circumference in energy levels, that conserve energy by transferring Total kinetic energy T into angular momentum L= r̄ mv̄ = r̄p = r̄Λ, where mass m = is a Constant. Different versors with different Energy (scalar) possess the same angular momentum. A Composition of Scalar Fields (s) and Vector Fields (v̄) of a frame, to a new unit which maps the alterations of Unit by rotation only and transforms scalar magnitudes (particle properties) to vectors (wave properties) and vice-versa, and so, has all particle **-** like properties of waves and particles. In Planck Scale, when the electron is being accelerated by gravity which exists in all energy levels as above, gravity is still exerting its force, so Electrodynamics can be derived from Newton's second law. [28-29]

9. Dark matter Energy (**λ. Λ= k 3**) is supposedly a homogeneous form of Energy that produces a force that is opposite of gravitational attraction and is considered a negative pressure, or antigravity with density 6x10 ⁻10 J/m3 and G = gravitational constant = L^3/MT^3 = 6,7x10 ⁻ $11m^4/$ N.sec^4, Planck force= Fp = c^4/g = $1,21x10^{44}$ N and dynamic Plank length = √ h.G / c^3 = 1,616x10 $^{-35}$ m ,and the reduced wavelength ƛ = λ/2π = c / w.

10. It has been explained that on [STPL] are carried Leptons, Quarks and Bosons, matter and Energy, which are all Particles with different intrinsic properties acquired from the prior mechanism. In recovery body Space, happen all interactions between Fermions, particles, and Bosons following all known laws.

The coupling of quantized Space and Energy (**ds and dP**) becomes on points of dipole **AiBi** through the Scalar potential field **P (X,Y,Z)** where **X,Y, Z** are the

generalized forces mapping to Flux Vector field
Vp = ∇.P = [(∂P/∂x) **x** + (∂P/dy) **y** + (∂P/∂z) **z**] =
[J. **x** + E. **y** + B.**z**] to the Density Scalar field
Dp **= ∇.Vp = ∇. (∇.P)** and to the Changeable Vector field **Cp = ∇ x Vp = ∇ x (∇.P)**.
Because the curl of the gradient of a Scalar field vanishes then , **Cs = Cp = 0** (produced fields).
The gauge freedom Unit vectors **dš = s(n1,2,3) , dP = P(n1,2,3).©** depended in Space and Anti-Space to be a source or sink then **x,y,z ↔ -x ,-y, -z** which presupposes Impulses PA = -PB **,** is force P which is
P = W/ds = ∂/∂š [W] = ∇W = ∇. [∇ J.©] = ∇ ²J.©
where Vector **J** = (∂P/∂x) **x** = dP(dx).© = Xp and,
∇²J → the Laplacian of vector field **J** and then
G.**∇²**. (**a**) ± G.**∇²**. (**b.i**) = **F = ∂U / ∂δj ------ (7)**
Electrons circulate around nucleus **forever** by using conserved interchanged magnitude J as velocity field, magnitude E as atom´s energy level field and B as energy exchanged field with the nucleus.
Tangent acceleration is a(t) = [û/|u|].d|u|/dt, Centrifugal acceleration is a(c) = |u|d / dt[û/|u|] .
Using (cgs) conventional units then **E** and **B** have the same units. **Spin** is **macroscopic (a)** on bound charge of Space and Anti-Space, and **microscopic** (**i**) on any separate dipole AiBi, combined through [STPL] Mechanism to produce a Positive and Negative charge layer on both sides so the two fields split as **E = Ea + Ei** and **B = Ba + Bi defining the unified Macroscopic and Microscopic bound conservation of Work.**
In a **Stress System** , the State of Principle Stresses (**σ**) at each point (it is the double refraction in **Photo – Elasticity)** is as the Isochromatics lines [(**σ1- σ2**) = J.k/d] or as Isochromatics surfaces.

9. Acknowledgment

The geometrical Reasoning of Planck Length ,
The Binomial nature of Monads in Monad and their intrinsic ,*Cycloidal wave motion*, as spin , i.e. the plane waves form the spherical standing waves .
The STPL line as the passage of particles from{O}frame to all Frames and is so the Navel cord (string) of galaxies
The Geometries related to Euclidean by Lorentz factor γ is as the geometrical expression of Spaces ,
The Origin of Particles from colliding Vector Breakages,
The Origin of Color forces from the Retardation and the Birefringence of Spaces ,
The Origin of Gravity from [O] Frame where is shown Incorporation into Quantum-mechanics ,
The time as the meter of changes , or as the conversion factor , between time (s) and space (m) units ,
The Structure of the Space-Energy universe and the Boundaries in it , of General Relativity,
The Cause and Events as the Energy quantization and the Breakages as ,masses, and ,c, as Thrust (push) is the content of this article .

Cycloidal motion is added in this article and it is proofed to be *the intrinsic property of vectors which is a Stationary wave on Norm of vectors* |AA| , *and thus Poinsot's ellipsoid becomes → Cycloidal Ellipsoid ← and the isochrones motion of spaces such that is possible for a constant velocity in the Systems* , where is shown that these are , the geometrical expression of Lorentz factor ,γ, of the related System-Spaces . Relativity is now placed as a part of the whole Euclidean geometry . A rotating system like the reference {O} with constant velocity c < **c`** → ∞ then this would move faster than **c** velocity.
By Considering breakages as ,*masses*, being off the system {O} and under the constant velocity **c** as Action , then the known formulas of GR for masses and Energy are Geometrically produced without any set restrictions , but from sec.φ = **γ** only.
Because breakages travel in {DA-PA} system (*frame*) with the constant velocity ,**c**, and so are in rectilinear motion between them, they occupy zero acceleration and thus can be converted to measurements in another by the simple Galilean transformations , because physical laws take the same form in all inertial systems .
By contrast Inertial frame {O} is the frame of reference which describes Space-Energy homogeneously and isotropically and in an genius manner , *where arbitrary number , t = time is defined as the conversion factor*

between time units (second) and length units (meter) , and this because of → sec.φ = γ = (c**t**/v**t**) .

In summary, the reason of writing this article is because my personal confidence is that nature is produced from Euclidean Geometry only, following Principle of Virtual work and not any other logical starting point . The essential difference between Euclidean and the non-Euclidean geometries has been attentive in the very specially written article (ordered) [32] for the nature of the parallel lines , a unique Postulate directly connected to the physical world . Now , [STPL] line (doubled cylinder in spatial CS) is the creation mould for Particles which are created between all Space-Levels . Since all spaces are also directly connected , then it is the ***Navel Cord (string)*** of the Galaxies and of all other Spaces . The present article is the proof to what is referred .

References :

[1] Matrix Structure of Analysis by J.L.MEEK library of Congress Catalog 1971.

[2] Der Zweck im Rect by Rudolf V. Jhering 1935.

[3] The great text of J. L.Heiberg (1883-1886) and the English translation by Richard Fitzpatrick.

[4] Elements Book 1.

[5] Wikipedia.org, the free Encyclopedia.

[6] Greek Mathematics, Sir Thomas L.Heath – Dover Publications, Inc, New York. 63-3571.

[7] [T] Theory of Vibrations by William T. Thomson (Fourth edition).

[8] A Simplified Approach of Squaring the circle, http://www.scribd.com/mobile/doc/33887739

[9] The Parallel Postulate is depended on the other axioms, http://vixra.org/abs/1103.0042

[10] Measuring Regular Polygons and Heptagon in a circle, http://www.scribd.com/mobile/doc/33887268

[11] The Trisection of any angle, http://vixra.org/abs/1103.0119

[12] The Euclidean philosophy of Universe, http://vixra.org/abs/1103.0043

[13] Universe originated not with BIG BANG, http://www.vixra.org/pdf/1310.0146v1.pdf

[14] Complex numbers Quantum mechanics spring from Euclidean Universe, http://www.scribd.com/mobile/doc/57533734

[15] Zenos Paradox, nature of points in quantized Euclidean geometry, http://www.scribd.com/mobile/doc/59304295

[16] The decreasing tunnel, by Pr. Florendin Smarandashe, http://vixra.org/abs/111201.0047

[17] The Six-Triple concurrency line – points, http://vixra.org/abs/1203.0006

[18] Energy laws follow Euclidean Moulds, http://vixra.org/abs/1203.006

[19] Higgs particle and Euclidean geometry, http://www.scribd.com/mobile/doc/105109978

[20] Higgs Boson and Euclidean geometry, http://vixra.org/abs/1209.0081

[21] The outside relativity space – energy universe, http://www.scribd.com/mobile/doc/223253928

[22] Quantization of Points and of Energy, http://www.vixra.org/pdf/1303.015v21.pdf

[23] Quantization of Points with and Energy on Dipole Vectors and on Spin, http://www.vixra.org/abs/1303.0152

[24] Quaternions, Spaces and the Parallel Postulate, http://www.vixra.org/abs/1310.0146

[25] Gravity as the Intrinsic Vorticity of Points, http://www.vixra.org/abs/1401.0062

[26] The Beyond Gravity Forced fields, http://www.scribd.com/mobile/doc/203167317

[27] The Wave nature of the geometry dipole, http://www.vixra.org/abs/1404.0023

[28] The Outside Relativity Space – Energy Universe, http://www.scribd.com/mobile/doc/223253928

[29] Planks Length as Geometrical Exponential of Spaces, http://www.vixra.org/abs/1406.0063

[30] Universe is built only from Geometry Dipole, http://www.scribd.com/mobile/doc/122970530

[31] Gravity and Planck`s Length as the Exponential Geometry Base of Spaces, http://vixra.org/abs/1406.0063

[32] The Parallel Postulate and Spaces (IN SciEP)

[33] The Origin of the fundamental particles in Planck`s Confinement . on Scribd & Vixra (FUNDAPAR.doc)

[34] The fundamental particles of Planck`s Confinement . (IJPST14-082601)

[35] The origin of fundamental particles (IJPST-E140620-01)

[36] The nature of fundamental particles (Fysispa.dpc).

[37] Relativity`s boundaries in Space-Energy universe (M).

[38] [M] The Quantization of Points and Potential and the unification of Space and Energy with the universal principle of Virtual work , on Geometry Primary dipole

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