



Atoms Energy – Stores and Photon .

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Abstract

One of the most important concept in geometry is , *distance* , which is the Quanta in geometry, while in Material-Geometry the composition of opposite , *the Material-point* , which is the Quanta in Chemistry and Physics. *As in Algebra* Zero ,0, is the *Master-key* number for all Positive and Negative numbers and this because their sum and multiplication becomes zero, *and the same* on any coordinate-system where \pm axes pass from zero , *Exists also Apriori in Geometry the Material-Point* in where the Rolling of the Positive \oplus , constituent on the Negative \ominus , constituent , creates the Neutral Material point which Equilibrium , and consists the *First – Discrete - Energy-monad* which occupies , *Discrete Value and Direction* , in contradiction to the point which is , nothing , *Dimensionless* and *without any Direction* . Material-point was proved to be the *First Energy monad* because occupies a Space , *a Cave \equiv Store* , in where exists an Eternal intrinsic rotation with a constant Angular-velocity $\bar{\omega}$ and an Angular-momentum vector $\bar{\mathbf{B}}$. This Angular – momentum is identical with *Spin* , which is trapped in caves` loops and which are in Phase with each other. From the definition of Work , *Work = Force x Displacement = Energy* , results the where this Energy as , *Momentum Vector $\bar{\mathbf{B}} \equiv Spin \equiv Energy$* , is stored in this , *r* cave. Is was proved , the ,*r*, cave , *IS* , *Outward a Stationary Box* , *Inward a Stationary Wave* , with infinite Frequencies $f_1 \dots f_n \rightarrow f_\infty$ and with Energy , $E = h \cdot f_n = \frac{h(1+\sqrt{5})}{4\pi} \cdot \left[\frac{\sigma}{r} \right] = \left(\frac{n\sigma}{8r^2} \right) \cdot \bar{\mathbf{B}} = W_d = v^2 \left[\frac{h}{2\pi} \right]$. [65] Photon is a Particle and also an Electromagnetic Wave with above properties and because Material-Point originates from Cycloidal-motion , *Changes Outward to Rotating Box* . The How and Why ? \rightarrow (Page 5) *From Mechanics in case that , in an Axisymmetric Rotating Body , with constant Angular-Velocity , ω , the moment of Inertia , $\mathbf{J}_x = \mathbf{J}_y$, is equal about the two of the three Principal axis , then ,*

- 1.. *The Angular – velocity - vector , $\bar{\omega}$, describes the Ellipsoid of Angular Velocity and its nib describes a Cone of which Plane-Base is Fixed , and Simultaneously ,*
- 2.. *The Angular-Momentum , $\bar{\mathbf{B}}$, describes the Ellipsoid of Angular-Momentum and its nib describes a Cone also of which Plane-Base is also Fixed .*
- 3.. *The Nib of Angular – velocity - vector , $\bar{\omega}$, describes on the Tangential-Plane of the Angular-Momentum-Ellipsoid , the Herpolhode , while ,*
- 4.. *The Nib of Angular-Momentum , $\bar{\mathbf{B}}$, describes on the Tangential-Plane , of the Angular-Velocity-Ellipsoid , the Polhode .*
- 5.. *The Fixed-Tangential-Planes on , $\bar{\omega}$, and , $\bar{\mathbf{B}}$, nib are alternately Perpendicular to , $\bar{\mathbf{B}}$, and , $\bar{\omega}$, central axes of rotation .*
- 6.. *The Kinetic Rotational – Energy of monad , which is the Work in monad , is the Scalar quantity , L , The Vector Angular Momentum quantity is , $\bar{\mathbf{B}}$, and the Vector Angular - Velocity*

quantity is , \bar{w} , which Three monads are related as $\bar{B} \cdot \bar{w} = 2L = J \cdot w^2$, where
 $J =$ The moment of inertia around the axis of rotation.

All above happen in , Material-Point , *where the Positive \oplus constituent , is Eternally self rolling on the Negative \ominus constituent* , with Angular-Velocity , w , *in Infinite Spherical traces , either at Great-circles [+or -] , or Small-circles , [+]* where is the Clockwise Left direction , and [-] where is the Anti-Clockwise Right direction , *or any other close Spherical-curve , and by Applying all laws of Mechanics into this Energy - Chaos , is thus created the \rightarrow First-Discrete – Energy-monad , the Material Point i.e. , The Quantum of Physics and , of all Energy-Space-Universe .*

Article [65] is the completion of prior [64].The Energy E dissipated per cycle is equal to the Work $W_d \rightarrow E = h.f = \frac{h(1+\sqrt{5})}{4\pi} \cdot \left[\frac{\sigma}{r} \right] = 8.k\zeta(\pi r^2)$, and *Stored in monad* , which is a Stationary Wave , *in ,n, loops as , $W_n = \left[\frac{4\pi r^2}{3} \right] \cdot f_n = \left[\frac{4\pi r^2}{3} \right] \cdot n f_1 = n \frac{(1+\sqrt{5})\sigma r}{3}$.* *Monad in Geometry \rightarrow Linearly* is , through mould of Parallel Theorem [44-45] ,*which are the equal distances between points of parallel and line \rightarrow In Plane* is through mould of Squaring the circle [46-47] , *where the two equal and perpendicular monads consist a Plane acquiring the common Plane- meter , π .*

\rightarrow *In Space* (volume) is through mould of the Duplication of the Cube [44-46] , *where any two Unequal perpendicular monads acquire the common Space-meter , $^3\sqrt{2}$, to be twice each other .* *Monad In Geometry* has the Monad , *the discrete continuity AB* length becoming from the Zero-Point $\equiv 0$, and *Mechanics - Physics* the Recent-Acquisition of the Material - Geometry , where Zero-point $0 = \emptyset = \{ \oplus + \ominus \} =$ The Material-point = *The Quantum* = Positive Space and Negative Anti-Space . [58]

Monad in Geometry \rightarrow Linearly is , through mould of Parallel Theorem [44-45] ,*which are the equal distances between points of parallel and line \rightarrow In Plane* is through mould of Squaring the circle [46-47] , *where the two equal and perpendicular monads consist a Plane acquiring the common Plane- meter , π , \rightarrow In Space* (volume) is through mould of the Duplication of the Cube [44-46] , *where any two Unequal perpendicular monads acquire the common Space-meter , $^3\sqrt{2}$, to be twice each other .* *Monad in Mechanics and Physics* is \rightarrow The Material-point = *the discrete continuity* $|\{ \oplus + \ominus \}| =$ *The Quantum* through mould of Space –Anti-space in itself , *which is the material dipole in inner monad Structure and is Identical with the Electromagnetic cycloidal field of Energy monads . The How becomes outer monad and Photon follows . This is , the Energy distance , the deep concept of Material-geometry.* [66]

Energy monads presuppose Energy-Space Base (*the caves beyond Planck`s length , Gravity`s and Spaces levels*) the [PNS] Space Anti-Space as work $\rightarrow W = \int P.ds = 0$, which is the cause of Spaces existence and the motion of particles . Since are also Quantized , then this property is encountered in Stationary waves where energy , E , is proportional to angular velocity w . This property of particles , *Angular momentum* = The *Spin* , becomes from the Intrinsic , *Inward* , *cycloidal wave motion* , where is then produced centrifugal acceleration which causing the external motion as *outward waves as Photon* . [43] The varying lever arms , on cycloid-evolute is the cause of vibrations and which cause the EM-waves and Spin . Common-circle of radius , r_c , is the common source of vibration excitation for the Space , Anti – space , considered as rotating with angular velocity , w , and then their relative motion becomes the , Rolling of Space , ABC , on Anti-space $A_E B_E C_E$ and since also this relative motion is applied on STPL [Six Triple Points Line] Mechanism , then D_A , P_A , points on it are the corresponding linear links of vibrations and Poles of rotation . [STPL] is a *Geometrical Mechanism* that produces and composite all opposite Space and Anti - space Points to Material-points \rightarrow Waves \leftarrow the three velocity - Breakages $\{ [s^2 = \pm (\bar{w}.r)^2 , [\nabla i] = 2(wr)^2 \}$ of [MFMF] mechanism under $\bar{v} = \bar{c}$ thrust } , and through it becoming , *The Fermions* $\rightarrow [\pm \bar{v}.s^2]$ and *The Bosons* $\rightarrow [\bar{v}.\nabla i = [\bar{v}.2(\bar{w}.r)^2] = [\bar{v}.2s^2]$, [35]

It was shown [33-36] that Un-clashed Fragments through center , O , consist the Medium-Field Material-Fragment $\rightarrow [\pm s^2] = [MFMF] =$ *The Chaos* , as base for all motions , and Gravity as force $[\nabla i]$, while

the clashed with the constant velocity, \bar{c} , consist the Dark matter $[\pm \bar{c}.s]$ and the Dark energy $[\bar{c}.\nabla i]$, **declaring that** → Antimatter-Galaxies and Antimatter – Asteroids can exist only as Dark-matter or and Dark-Energy and **Not** as Antimatter light, - c , alone, or from → velocity - Breakages, $[\pm s^2 = \pm (wr)^2]$ and $[\nabla i = 2(wr)^2]$, where then become Waves { Distance $ds = |AA_E|$ is the Work embedded in monads and it is what is vibrated } with the Vibrating equations of motion, become,

- A → Particles, with Inherent Vibration,
- B → Gravity-Field-Energy, without Vibration
- C → Dark-matter-Energy constituents and as below,

- A.. $[\pm \bar{v}.s^2]$ → Fermions and → $[\bar{v}.\nabla i]$ → Bosons,
- B.. $[\pm s^2]$ → [MFMF] Field ≡ **The Energy - Chaos**, and the binder Field is $[\nabla i]$ → Gravity force,
- C.. $[\pm \bar{c}.s^2]$ → Dark matter, and the binder Gravity force $[\nabla i]$, $[\bar{c}.\nabla i]$ → The Expanding Dark energy, which both are moving with light velocity, c , causing the universe to grow.

From above in, A, and, C, case → Energy as velocity, \bar{v} , exists in the Discrete monads, $\pm \bar{v}.s^2$ and $\pm \bar{c}.s^2$.

B, case, → is the transportation of Energy, from Chaos to stationary Material points either

Linearly, STRING, $[\oplus s^2 \leftrightarrow \ominus s^2]$ or **Rotationally**, SPIN, $[\oplus s^2 \cup \cup \ominus s^2]$.

The How Energy from Chaos becomes **the Monad** of particles in [64 – 65].

Dark Energy DE ≡ $[\bar{c}.\nabla i]$ (©) → Acting on the Five Constituents → $[(\nabla i), (+s^2), (-s^2), (+cs^2), (-cs^2)]$

- $[\pm s^2]$ → MFMF Field $[\pm \bar{c}.s^2]$ → DM-DE Field, of, Dark matter and Anti-matter.
- $[\pm \bar{v}.s^2]$ → Fermions $[\nabla i]$ → G_f = Gravity-Force in DM-DE Field.
- $[\bar{v}.\nabla i]$ → Bosons, $[\bar{c}.\nabla i]$ ≡ DE → Dark Energy

c x (©) $[\nabla i]$ → Gravity Force DE ≡ $[\bar{c}.\nabla i] = \bar{c} [\nabla i]$ = The Travelling-Energy with, c , velocity.

A : THE MONADS FROM STATIONARY CHAOS.

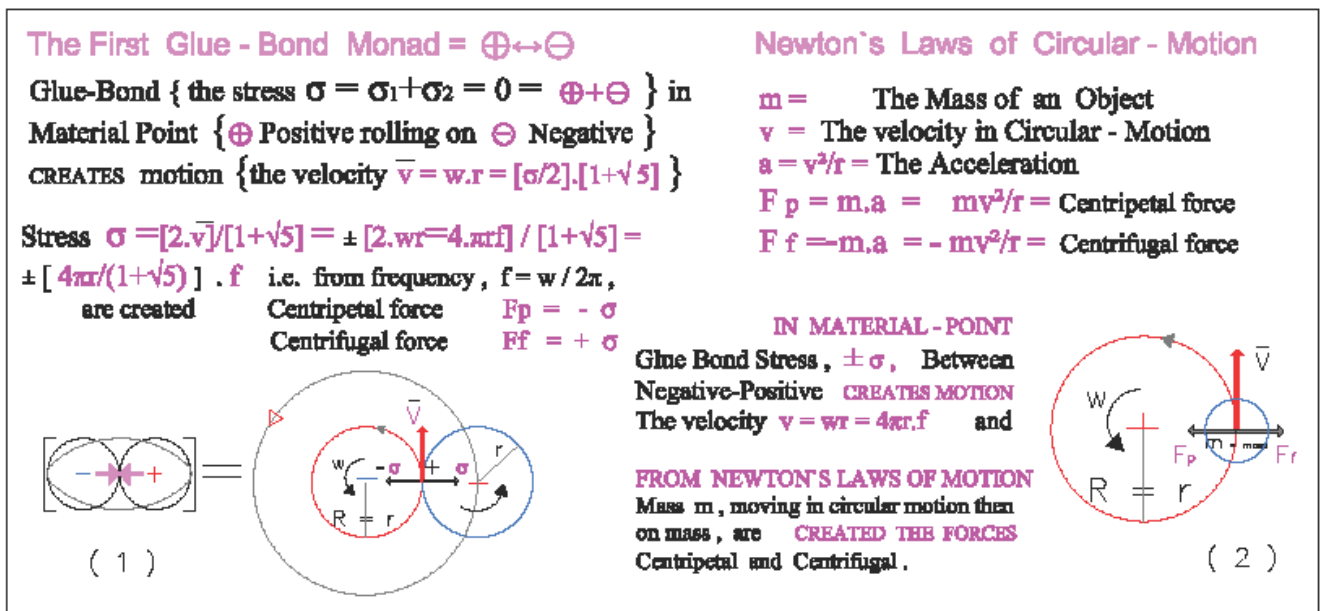


Figure .1. In (1) The Glue-Bond pair of opposites $[\ominus \oplus]$, **Creates Rotation** with angular velocity $w = v/r$, and velocity $v = w.r = \frac{2\pi r}{T} = 2\pi r . f = [\frac{\sigma}{2}].[1+\sqrt{5}]$, and or frequency $f = \frac{(1+\sqrt{5}).\sigma}{4\pi r}$, with Period $T = \frac{4\pi r}{\sigma(1+\sqrt{5})}$ where $\pm \sigma$, are the two equal and opposite, Centripetal F_p and Centrifugal F_f Glue-bond forces.

The Energy Stores of Photon

In (2) Mass , m , of an object rotating with velocity , \bar{v} , in a cave of radius , r , creates a pair of equal and opposite forces the Centripetal F_p and Centrifugal F_f .

Newton`s , First - Law states that , *Any change in motion involves an acceleration* , a .

In circular motion , for an object of mass , m , acceleration is equal to , $a = \frac{v^2}{r}$ and force , F , acted is $F = m.a = m \frac{v^2}{r}$, which is the Centripetal force F_p .

From Newton`s Third-Law , *All forces in the universe occur in equal but opposite directed pairs* , then For any Centripetal force F_p , there is a force of equal magnitude but of opposite direction , the Centrifugal force , F_f , which acts back on the object , *without specifying the nature , or origin of the forces* .

In Material-point , $[\oplus\ominus]$, **both forces exist a priori** , as the Glue-Bond between the two opposites which is the main Stress $\sigma = \pm \frac{2.v}{(1+\sqrt{5})}$, and since $v = w.r = 2\pi r / T = (2\pi.r) . f$, where $r =$ the radius of the Energy cave \equiv Store (**the inner monad discrete Chaos**)

$f =$ the frequency of this rotation where , then $\sigma = \pm \frac{4\pi r}{(1+\sqrt{5})} . f$ or $\rightarrow f = \frac{\sigma(1+\sqrt{5})}{4\pi r}$.

i.e. a relation between the Glue-Bond , σ , and the frequency , f , of the rotation , or ,

In **Chaos** where $r = r \rightarrow 0$ between the \oplus , \ominus , Opposites , exists a Stress , σ , The Centripetal F_p , and Centrifugal force , F_f , which nature is only the frequency in a complete rotation , and

from Planck`s equation $E = h.f = \frac{h(1+\sqrt{5}) . \sigma}{4\pi r} = \frac{h(1+\sqrt{5})}{4\pi} . \left[\frac{\sigma}{r} \right]$, and then **from Chaos** $r = r \rightarrow 0$,

becomes the Monad , $[\oplus\ominus]$, which is **the Neutral – Material – Point** . A wide analysis in [59]

B : THE SPIN OF MONADS

1.. Introduction .

The intrinsic rotation of an elementary particle is called **Spin** , and is the amount of the quantized **Angular momentum** which is conserved as Potential or Kinetic Energy and *vice versa* . Is proved that Spin is vector , \bar{B} , which interacts with magnetic fields and have an effect on bulk properties. The Glue-Bond motion in Material point (*The Rolling of the Positive on Negative*) may be either on Great-circles , or on Small circles in the two Semi-spherical of the Stationary $[\ominus]$ constituent . Motion of the $[\oplus]$ constituent on each Semi-spherical of the $[\ominus]$ constituent , is in the opposite Direction , *and this accidentally because such is the Geometry of Space* , so this Property defines , Spin to be either Clockwise or Anti- clockwise , that is to say Positive $[+]$ or Negative $[-]$ *which is the Symmetry in Opposites* and where the Total Energy is $L = (B/2).w$

The Geometrical construction of the Particle`s Spin is shown in Figure.2.

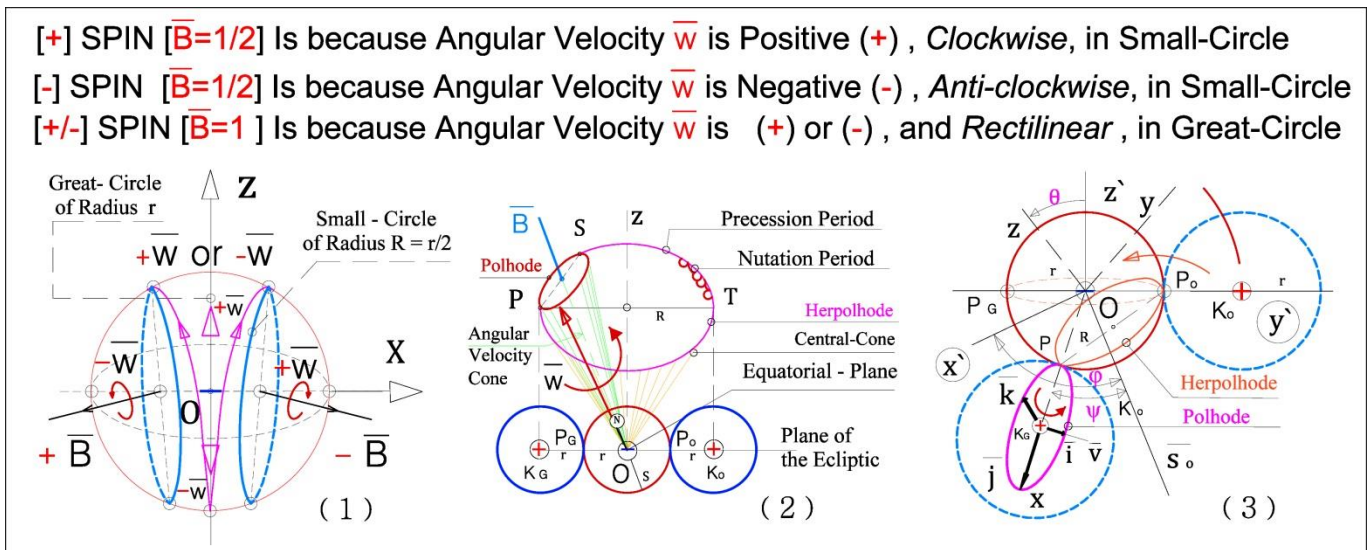


Figure 2.. In (1) The Glue-Bond pair of opposites $[\ominus \oplus]$ of the **Rectilinear motion in Great circles**, creates rotation on circle of radius , r , with velocity $v = w.r = \frac{2\pi}{T}.r = 2\pi r.f = [\frac{\sigma}{2}].(1+\sqrt{5})$, where frequency $f = \frac{(1+\sqrt{5}).\sigma}{4\pi r}$, Period $T = \frac{4\pi r}{\sigma(1+\sqrt{5})}$ and $\pm \sigma$, are the two equal and opposite Centripetal, F_p , Centrifugal, F_f forces . Energy is $\rightarrow E = h.f = \frac{(1+\sqrt{5}).\sigma h}{4\pi r}$ in **Zero Wave-note**.

In (1) The Glue-Bond pair of opposites $[\ominus \oplus]$ in the **Left Direction of Small circles**, creates rotation on circle of radius , R , with velocity $v = w.2r = \frac{2\pi}{T}.2r = 4\pi r.f = [\frac{\sigma}{2}].(1+\sqrt{5})$, where frequency $f = \frac{(1+\sqrt{5}).\sigma}{8\pi r}$, Period $T = \frac{8\pi r}{\sigma(1+\sqrt{5})}$ and $\pm \sigma$ are the two equal and opposite Centripetal, F_p , Centrifugal, F_f forces . Energy is $\rightarrow E = h.f = \frac{(1+\sqrt{5}).\sigma h}{8\pi r}$ in **One Wave-note**.

In (1) The Glue-Bond pair of opposites $[\ominus \oplus]$ in the **Right Direction of Small circles**, creates rotation on circle of radius , R , with velocity $v = w.2r = \frac{2\pi}{T}.2r = 4\pi r.f = [\frac{\sigma}{2}].(1+\sqrt{5})$, where frequency $f = \frac{(1+\sqrt{5}).\sigma}{8\pi r}$, Period $T = \frac{8\pi r}{\sigma(1+\sqrt{5})}$ and $\pm \sigma$ are the two equal and opposite Centripetal, F_p , Centrifugal, F_f forces . Energy is $\rightarrow E = h.f = \frac{(1+\sqrt{5}).\sigma h}{8\pi r}$ in **One Wave-note**.

In analysis , *The Torsional Momentum is a Vector noted as \bar{B} , and is the Spin of monads* [65].

C.. GENERAL :

From the definition of Work , **Work = Force x Displacement = Energy**, results the where this Energy as , **Momentum Vector $\bar{B} \equiv Spin \equiv Energy$** , is stored in r , cave of $KK_1 = \bar{q} = [s+\sqrt{v}i]$. Cave , r , **IS**, *Outward a moving-Stationary Box*, *Inward a Stationary Wave*, with infinite frequencies $f_1 \dots f_n \rightarrow f_\infty$ and with Energy , $E = h.f_n = \frac{h(1+\sqrt{5})}{4\pi} . [\frac{\sigma}{r}] = (\frac{n\sigma}{8r^2}) . \bar{B} = W_d = 8.kf_n A_r$.

The How and Why , **This Inward Stationary Wave** becomes an , **Outward moving Wave**, follows .

1.. Cycloid :

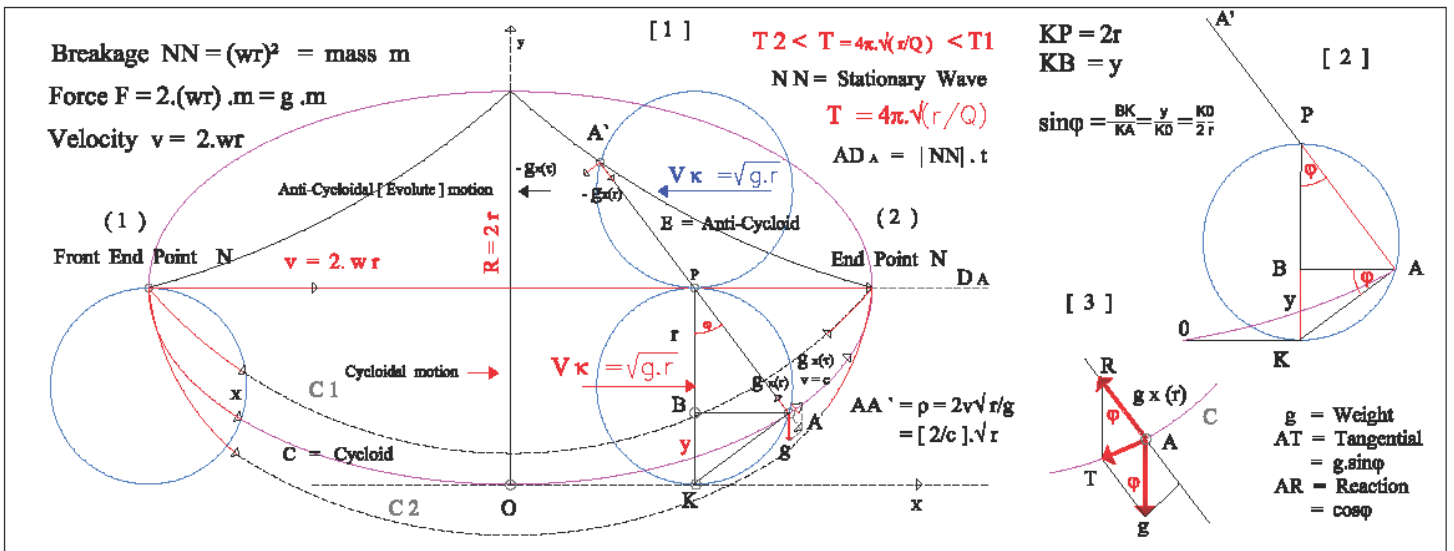


Figure 3.. The Cycloidal motion in , Material Point \equiv Monad is the Dipole $\equiv [\oplus \ominus] = \emptyset = AA'$ where $\rightarrow A \equiv [\oplus] \rightarrow A' \equiv [\ominus] \rightarrow |AA'| \equiv \emptyset \equiv$ The Brachistochrone Curve $C \equiv N1 \rightarrow N2$. Motion of Dipole $[AA']$ on curve $C1$ acquires a period $T1 > 4\pi\sqrt{r/g}$ while on $C2$ $T2 < 4\pi\sqrt{r/g}$ which is not Isochronous . Motion of Dipole $[AA']$ on Curve C , The Cycloid , acquires a CONSTANT period $T = 4\pi\sqrt{r/g}$ which is Isochronous .

Monad (1) –(2) = NN is The Electromagnetic Wave in NN , and [AA`] Energy Distance.

Properties :

Cycloid is the curve described (traced) by a point P, on the circumference of a circle of radius , r, as this rolls along a straight line AA without slipping on an orthogonal coordinate system (x,y) at O . Let find the equation of this curve using the geometry logic in mechanics .

In absolute magnitudes $\frac{dy}{dx} = \frac{KB}{KA} = \frac{BA}{BP} = \frac{BA}{2r-y}$ and $(BA)^2 = (BP).(BK) = (2r-y).y$ and by squaring $\rightarrow (\frac{dy}{dx})^2 = \frac{y}{2r-y}$ (a)

which is the differential equation of cycloid , and or as $\rightarrow (\frac{dx}{dy})^2 + 1 = \frac{2r}{y}$

For any element on trace ,ds , issues (a) and Pythagoras theorem as

$$(ds)^2=(dx)^2+(dy)^2 = (\frac{2r}{y} - 1).(dy)^2 + (dy)^2 = (\frac{2r}{y}).(dy)^2 \text{ and } ds = \sqrt{2r}.y^{-1/2}.dy \text{ and by integrating ,}$$

$$\int ds/dy= s = \sqrt{2r}. \int_0^y y^{-1/2} = \sqrt{2r}. \frac{y^{+1/2}}{-1/2} = 2.\sqrt{2ry} + C \text{ and since in axis for } y=0 \text{ exists } s=0 \text{ and } C=0,$$

$$\text{so } s = 2\sqrt{KP.KB} = 2.\sqrt{KA^2} = 2.KA = 4r.\sin \varphi \text{ (b)}$$

i.e. the length of Cycloid Curve , from point O to point A , is twice the Segment of chord KA and when point A is at the end point (2) then $\rightarrow 2.KA = 4r$ for the semi-cycloid.

The area between the curve and the straight line is $A = 3\pi r^2$ and the arc length $l = 8r$.

For motion on cycloid , we consider a Weight Q , at point A , moving with free motion . Since reaction N , is vertically acting , doesn't give any Tangential component therefore the only one becomes from Q which is equal to $AT = g.\sin \varphi$, and since from (b) , $\sin \varphi = \frac{s}{4r}$ then $AT = g.\frac{s}{4r}$.

$$\text{Since acceleration} = \frac{d^2s}{dt^2} = \frac{dv}{dt} = \frac{d}{dt}(\frac{ds}{dt}) = -g.\frac{s}{4r} \text{ then } \frac{d^2s}{dt^2} = -g.\frac{s}{4r} \text{ or } \{ \ddot{x} = -w^2 \dot{x} \text{ where } w = \frac{2\pi}{T} \} \text{(c)}$$

Equation (c) is a Harmonic Oscillatory motion showing that Acceleration is proportional to displacement and is directed towards the origin with a period $T = \frac{2\pi}{w} = 2\pi.\sqrt{\frac{4r}{g}} = 4\pi.\sqrt{\frac{r}{g}}$ (d) since $w^2 = \frac{g}{4r}$ i.e.

Equation (d) denotes that the Harmonic Oscillation due to any Force or Weight which follows the free motion on cycloid , is Independent of the amplitude of oscillation and , is Isochronous .

Since total period of oscillation $T = 4\pi.\sqrt{r/g}$ and which does not depend on speed of rolling , (Huygens cycloid pendulum) but only from rolling radius , r, means that 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 (isochrones) . This property is used for breakages to reach STPL line isochrones. Evolute also of a cycloid is a cycloid itself , (apart from coordinate shift) . Velocity vector of any motion is directed along the tangent and is the sum of the velocity vectors of the constituent motion , thus at each point A , of a cycloid , the line joining that point , to the point P, that circle is , then at the top of the generative circle is tangent to the Anti-cycloid and the line joining point A` , that is to that of bottom (of circle) is normal to the cycloid . Evolutes of a cycloid , ***The Space \equiv matter*** , is the balancing cycloid , ***The Anti - Space \equiv Anti-matter*** , and is called Anti-cycloid , [A \leftrightarrow A`] .

The *Tangential component of Acceleration* is $AT = g.\sin \varphi = \frac{g}{4r}.s$ and analogous to OA arc ,

While the *Centrifugal component of Acceleration* $\frac{v^2}{\rho}$, is dependent on initial point of motion.

Any Material point moving from A to P point , acquires velocity $v^2 = 2.g.PB = 2g(2r-y)$ and

$$\frac{v^2}{\rho} = \frac{2g(2r-y)}{2.PA} = g.\cos \varphi = g.\frac{PA}{2r} = \frac{g}{4r}.\rho \text{(e)}$$

i.e. The Centrifugal component of Acceleration is proportional to curvature radius , ρ , with the same proportionality ratio $g/4r$ meaning that any motion on cycloid is outward directed, or and , acceleration

$\ddot{x} = -w^2 \dot{x}$ produces the Skin - effect , during the cycloidal motion of Space and Anti-space . [5]

The velocity $v = \sqrt{g/4r}$. ρ is proportional to curvature radius ρ , with proportionality ratio the root of $g/4r$. On cycloid , all moving points on y axis reach x-x axis at the same time (isochrones motion) regardless of the height from which they begin (they do not depend on the oscillation amplitudes) , or if , a particle of mass $m=|(wr)^2|=1$ tied to a fix point A executes a Simple harmonic motion under the action (Thrust) of the tangential velocity $\bar{v}=\bar{w}\cdot\bar{r}$. Since also \rightarrow the linear momentum $\bar{p}=[\text{Breakage x Velocity}]$ then

$$\bar{p} = [\text{Breakage x Velocity}] = |\bar{w}\cdot r| \cdot \sqrt{g/4r} \cdot \rho = \bar{w} \cdot \sqrt{gr} \cdot \rho = \sqrt{gr}\cdot\rho\cdot|\bar{w}|, \text{ and follows that ,}$$

a Cycloid's trajectory with , a Total time period $T = 4\pi \sqrt{(r/g)} = \frac{r}{2v} \cdot \sqrt{\frac{r}{g}}$ and is dependent ,

on angular velocity $\bar{w} = \bar{v}/r = \bar{c}/r$ only and it is the Spin of particle $|AA|$.

Remarks :

a.. Breakage x Velocity = $\sqrt{gr}\cdot\rho\cdot|\bar{w}|$, and force $F = [(\bar{w}\cdot r)^2\cdot(\bar{w}\cdot r)] = 2(mg/\bar{c}) \cdot \bar{w} = 2mg\cdot(\frac{\bar{w}}{\bar{c}})$,

This property is used to show that the wavelength of norm $|\bar{v}|$, of vectors \bar{v} , is a Stationary wave, with the two edges as Energy material nodes ,Cycloidally carried on wavelength $|\lambda| = 2|A1-A2|$ twice the norm.

$KA = 2\cdot r \cdot \sin \varphi$ and $KA \cdot \sin \varphi = y$ so $\sin^2 \varphi = y/2r$ and $\cos^2 \varphi = 1-y/2r = \frac{2r-y}{2r}$ and by division becomes

$$\frac{v}{\cos \varphi} = \sqrt{4gr}, \text{ which means that any Weight falling , or rolling on Cycloid from upper point A , the ratio}$$

$$\frac{v}{\cos \varphi} \text{ remains constant , and for the center of PK } v_K = v \cdot \frac{r}{PA} = \frac{1}{2} \cdot \frac{v}{\cos \varphi} = \sqrt{gr} , \text{ i.e. the rolling circle has a}$$

constant velocity and with an area of moving circle $A = \pi\cdot r^2 = \pi\cdot(2r \cdot \cos \varphi)^2 = \pi R^2 \cdot \cos^2 \varphi$.

b.. Thrust is the velocity vector $\bar{v} = \bar{w}\cdot r$ on the circumference of common circle of the inversely rotating Space, anti-Space becoming from the rotational energy vector $\pm \Lambda$ of PNS. The wavelength of 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 static deflection, ds, then $T = 1/f = 2\pi/w$ where $ds = z = \bar{v} = A\cdot e^{i\cdot wt} = \bar{v}\cdot \cos wt + i\cdot \bar{v}\cdot \sin wt$.

i.e. Breakages acquire different velocities and different energy , and because are following cycloid trajectories , thus , need the same time (isochrones) to reach [STPL] line. Simultaneity is a property of Absolute system and the intrinsic property of vectors and Poinso't's ellipsoid now becomes a

< Cycloidal ellipsoid > since on $c1(T1) > c > c2(T2)$.

Any material point [Medium-Field Material-Fragment] $\rightarrow [\pm s^2]=|\bar{w}\times\bar{r}|^2\rightarrow$ [MFMF] Field following trajectory , in = (c1), or , out = (c2) , Cycloid = (c) = $|A1-A2|$ needs more or less time

$$T(2) < T = 4\pi \sqrt{(r/g)} < T(1) \text{ to reach end } A2.$$

And since frequency $f = 1/T$ and energy $E = h\cdot f$ then Cycloid motion Controls constancy of Energy by changing velocity, $\bar{v} = \bar{w}\cdot r$, and the period ,T, of monads.

Breakage quantity $2\cdot(wr)^2$ under the tangential action $\bar{v} = wr$ becomes $2\cdot(wr)^3$ acting on point A $\rightarrow 2wr\cdot m$ of common circle. The same also for points A,B,C of Space and A_E, B_E, C_E of Anti-Space . Because all velocity vectors AA, BB, CC carry material points A,B,C at points D_A, D_B, D_C ,in time ,t, isochrones , then material points follow a cycloid with period the norm of wavelength of velocities $|AA|, |BB|, |CC|$.

This Simultaneity is succeeded by Lorentz factor where transformations between Inertial frames that preserve the velocity of light will not preserve simultaneously. [65]

c.. Work W , by a constant force $F = 2(wr)^2$ exerted on an object [breakage $\pm(wr)^2$] which moves with a distance times $dx=|(wr)^2|$ is capable of Vibration and is calculated in two perpendicular Formulations $(dx\perp dy)$ which is as, Stiffness $k = N/m \rightarrow$ velocity vector $v1 \rightarrow$ Electric field $E \rightarrow$ and Flexibility $f = m/N \rightarrow$ velocity vector $v2 \rightarrow$ the Magnetic field P . For more in [39-40] . The why Energy is transformed into velocity , and velocity to a field is explained also through Extrema Principle . [41]

Cycloid of Figure.3. is a cave and let this be IN Common-circle of STPL mechanism .

[1] The applied force on this NN cave is $E = h\cdot f = w\cdot (h/2\pi) = w \cdot \text{Spin}$, and

$$\text{Spin} = \frac{E}{w} = [\pm \bar{v}\cdot s^2]/w = (r\cdot s^2)$$

[2] For $E = \pm \bar{v}$ then $\rightarrow \text{Spin} = \frac{E}{w} = [\pm \bar{v}\cdot s^2] / w = (\pm r \cdot s^2) \rightarrow$ Producing \pm Fermions with spin $\frac{1}{2}$

[3] For $E = [\nabla i = 2(wr)^2 = 2.\bar{v}s^2] = 2.(r.s^2)$ then $Spin = \frac{E}{w} = [2.\bar{v}.s^2] / w = 2.(r.s^2) \rightarrow$

Producing *Bosons of spin 1*

i.e. **Double energy** $[2.(r.s^2)]$ on a constant cave creates **2** crests and doubling the frequency (**h**), with **Spin 1**. For **N-times energy** $[N.(r.s^2)]$ on a constant cave creates **N** crests N-times the frequency (**h**) with **Spin N/2**.

Since Energy in cave is an Electromagnetic Wave $[\bar{E}x\bar{H}] = Pressure = Spin S = \rho.c.w$, or $[\epsilon E^2 + \mu H^2] / 2 = 2rc. \sin.2\phi \rightarrow$ then Energy / $\sin 2\phi = [\epsilon E^2 + \mu H^2] / \sin 2\phi = 2rc / \rho w = 4r^2 / \rho = constant$, happening only on Cycloidal motion, where $\epsilon =$ Permittivity and $\mu =$ Permeability. [41]

Since in Cycloid acceleration $\ddot{x} = -w^2 \dot{x}$ produces the Skin - effect \rightarrow therefore on material - point the Inner-Energy as rotational Momentum \equiv Spin is transformed into the Outer Electromagnetic-Wave and Cancel, during the cycloidal motion, the propagation of Space and Anti-space, towards AA' axis [33]

2.. The flexible String :

Material point may be considered as a *flexible String of mass*, ρ , per unit length, which is stretched under tension $T = \pm \sigma$, due to the principal stresses on KK_1 axis. The lateral deflection, y , of the string KK_1 to be small, the change in tension with deflection, is negligible and is ignored.

The equation of motion in the, y , direction according to Newton`s second law is,

$$T [\theta + \frac{\partial \theta}{\partial x} dx] - T\theta = \rho.dx.\frac{d^2y}{dt^2} \quad \text{or} \quad \rightarrow \quad \frac{\partial \theta}{\partial x} = \frac{\rho}{T} \cdot \frac{d^2y}{dt^2} \quad \dots\dots(1)$$

and because the slope of the string KK_1 is $\theta = \frac{\partial y}{\partial x}$ equation (1) reduces to $\frac{\partial^2 y}{\partial x^2} = \frac{1}{c^2} \cdot \frac{\partial^2 y}{\partial t^2} \quad \dots\dots(2)$

where $c = \sqrt{\frac{T}{\rho}} = \sqrt{\frac{\sigma}{\rho}}$ and can be shown to be the velocity of wave propagation along the string.

The general solution of the equation (2) can be expressed in the form $y = F_1(ct - x) + F_2(ct + x)$ where, F_1, F_2 , are arbitrary functions and regardless of the type of function, the argument $(ct \pm x)$ upon

differentiation leads to equation $\frac{\partial^2 F}{\partial x^2} = \frac{1}{c^2} \cdot \frac{\partial^2 F}{\partial t^2} \quad \dots\dots\dots(3)$ and hence the differential equation is

satisfied, the wave profile moves in the $\pm x$, direction with speed, c , therefore refer to, c , as the velocity of wave propagation. The solution of (3) using the separation of variables is $y(x,t) = Y(x).G(t) \quad \dots\dots(4)$

and by substitution to (2) then $\rightarrow \frac{1}{Y} \cdot \frac{d^2Y}{dx^2} = \frac{1}{c^2} \cdot \frac{1}{G} \cdot \frac{d^2G}{dt^2} \quad \dots\dots\dots(5)$ where the left side is

independent of, t , and the right side independent of, x , so both sides must be constant.

Letting this constant be $-\left[\frac{w}{c}\right]^2$, are obtained the two ordinary differential equations,

$$\frac{d^2Y}{dx^2} + \left(\frac{w}{c}\right)^2 Y = 0 \quad \text{and} \quad \frac{d^2G}{dt^2} + w^2 G = 0 \quad \text{with the general solution,}$$

$$Y = A.\sin\left(\frac{w}{c}x\right) + B.\cos\left(\frac{w}{c}x\right) \quad , \quad G = C.\sin wt + D.\cos wt \quad \dots\dots\dots(6)$$

The arbitrary constants A, B, C, D , depend on the boundary conditions and the initial conditions.

When the string $KK_1 = ds$ is stretched between $ds = l$, the boundary conditions are $y(0,t) = y(l,t) = 0$.

The condition that $y(0,t) = 0$, leads to the solution $y = [C.\sin wt + D.\cos wt].\sin\left(\frac{w}{c}x\right) \quad \dots\dots(7)$

The condition that $y(l,t) = 0$, leads to the equation $y = \sin\left(\frac{wl}{c}\right) = 0$ or, $\sin\frac{wl}{c} = 0$

and, $\frac{w.l}{c} = \frac{w_n.l}{c} = n.\pi$, where $n = 1, 2, 3, 4, \dots n \dots\dots \infty \quad \dots\dots\dots(8)$

and so $\lambda = \frac{c}{f}$ is the wavelength, $f =$ the frequency of oscillation i.e.

Each, n , represents a Normal - Mode - Vibration with natural frequency determined from equation,

Natural frequency $\rightarrow f_n = \frac{n}{2.l} c = \frac{n}{2.l} \cdot \sqrt{\frac{T}{\rho}} = \frac{n}{2.l} \sqrt{\frac{\sigma}{\rho}} = \frac{n}{4r} \sqrt{\frac{\sigma}{\rho}} = \frac{n}{4r^3} \cdot \sqrt{\frac{(1+\sqrt{5})^2 \sigma^2}{4\pi^2 r^4}} = \left[n \frac{\sigma(1+\sqrt{5})}{\pi (2r)^3} \right] \quad \dots\dots\dots(9)$

and the sinusoidal mode shape $\rightarrow Y = \sin(n\pi \frac{x}{l}) = \sin(n\pi \frac{x}{2r})$ for caves $l = 2r$ i.e. Fig3 - 3

The rotating axis AA' creates the , Linear vibration of string , and the Natural - frequency f_n ,in Material – point $A' \equiv [\ominus] \leftrightarrow A \equiv [\oplus]$ as well the Rotational vibration of string $[\oplus s^2 \cup \cup \ominus s^2]$.

In the more general case of free vibration of Material-point , **Linear $[\oplus s^2 \leftrightarrow \ominus s^2]$ or Rotational $[\oplus s^2 \cup \cup \ominus s^2]$** in any manner , the solution will contain many of the normal modes and the equation for the displacement can be written as ,

$$y(x,t) = \sum_{n=1}^{\infty} C_n \sin (w_n t) + D_n \cos (w_n t) . \sin(n\pi \frac{x}{l}) \quad \text{and} \quad w_n = \frac{n\pi c}{l} = \frac{n\pi c}{2r} \quad \dots\dots\dots(10)$$

where , by fitting equation to the initial conditions of $y(x,0)$ and $\dot{y}(x,0)$, the C_n , D_n , can be evaluated.

From Planck's Energy $E = h.f = (h/\lambda).c$ is equal to the Isochromatic pattern fringe-order in monad as $\sigma_1 - \sigma_2 = (a/d).N = (a/d).n.f_1 = (8\pi^2/3).nf_1$ where , $n =$ the order of isochromatic , a number , and , $f_1 =$ The frequency of Fundamental - Harmonic .

This is the why colors exist in fringe - order and are of wave form.

Since total Energy in cave , $(wr)^2$, is dependent on frequency only , and stored in the Fundamental and the first Six Harmonics , so the summations bands of these Seven Isochromatic Quantized interference fringe order-patterns , is the Total Energy , E , in the same cave $(wr)^2$ as ,

$$E = \text{Spin , work} \rightarrow W = \bar{S}.w = (h/2\pi).2\pi f = [\frac{8\pi r^2 f_1}{3}].[\frac{n(n+1)}{2}] = [\frac{4\pi r^2 f_1}{3}].n.(n+1) \quad \text{and} \quad \dots\dots(11)$$

Represents the Total Energy Stored in cave , r , and of , n , fringes where $\rightarrow f_1 = \frac{(1+\sqrt{5})}{4\pi r} . \sigma$

When stress $(\sigma_1 - \sigma_2)$ go up then , $n =$ order fringe defining Energy goes up also ,and the colors cycle through a more or less repeating pattern and the Intensity of the colors diminishes .Since phase $\phi = kx-wt =$ Spatial and Time Oscillation dependence , For $n = 1$, Energy in the First Harmonic is ,

$$E = 2\pi r.c = [\frac{2\pi r^2}{3}].f_1 \quad , \text{ and for } n = 2 \quad , \text{ Energy in the First and Second Isochromatic Harmonic is ,}$$

$$E = [\frac{4\pi r^2}{3}].f_1 \text{ in threes, and , } \phi \text{ , is trisected with Energy-Bunched variation } f_2 \text{ , i.e.}$$

Energy stored in a homogeneous resonance , is spread in the First of Seven-Harmonics beginning from the (first) Fundamental and after the filling with frequency , f_1 , follows the Second - Harmonic with frequency , $2.f_1$, $3.f_1$,,,,,, and so on , thus representing the **Store** of Energy .

In this - way the Energy Space monads are generated from the frequency in caves , or from the slits .

Also this is the How Spin is 1 or 1/2 or $\frac{l}{N}$, . . The Why Spin is , $\frac{l}{2}$, $\frac{l}{3}$, $\frac{l}{4}$, $\frac{l}{5}$, $\frac{l}{N}$, in monads i.e.

One , Half ,Third ... $\frac{1}{N}$. Lengths $\rightarrow [\frac{l}{1}] , [\frac{l}{2} , \frac{l}{2}] , [\frac{l}{3} , \frac{l}{3} , \frac{l}{3}] , , , , [\frac{l}{N} , , , \frac{l}{N}]$, with One ,Two ,Three ,,, N

Wave-nodes , where Spin $= \bar{B} = f_n . (\frac{8r^2}{n\sigma}) =$ Energy in N wave-node-loops as energy frequencies .

In Second-Harmonic energy as frequency is doubled and this because of sufficient keeping homogeneously in Spatial dependence , Quantity $kx = (2\pi/\lambda).x$, which is in threes , meaning that ,

Dipole-energy is Spatially-trisected in Space - Quantity Quanta the Spin= $h/2\pi$ as the angle ϕ , of phase $\phi=kx-wt=(2\pi/\lambda).x$, **and Bisected** by the Energy-Quantity Quanta as this happens in an RLC circuit . [49] .

Since Momentum-Ellipsoid , \bar{B} , is perpendicular to , Angular - velocity-Ellipsoid , \bar{w} , no Work is produced and the Status is Neutral . This property issuing in Material - point allows , Spin $\equiv \bar{B}$ Vector and the Velocity-Magnitude $\equiv \bar{w}$, be conserved as Total Energy $2L = \bar{B} . \bar{w} = J . w^2$.

3.. The Energy in Stationary loops and Photon :

In Material point , **and because of rotation , Stretched - String Energy \bar{B} is not transmitted , but trapped in the , N loops , where $\bar{B} =$ Motion in Loops , are all in Phase with each other, and the amplitude of oscillation varies from zero , at the N nodes , to maxima at the antinodes . By considering rotation as a**

grating having N lines per ,r, then maximum values of ,n, is $n < \frac{1}{N\lambda}$, i.e. the biggest whole number less than $\frac{1}{N\lambda}$ which is always integer and \rightarrow the N loops are the N Energy - Stores in M-P .

This is the Why Spin is , $\frac{l}{2}, \frac{l}{3}, \frac{l}{4}, \frac{l}{5}, \dots, \frac{1}{N}$, i.e. to N^{th} - loop

One , Half ,Third ... $\frac{1}{N}$ - of Length as the loops $\rightarrow [\frac{l}{2}, \frac{l}{2}], [\frac{l}{3}, \frac{l}{3}, \frac{l}{3}], \dots, [\frac{l}{N}, \frac{l}{N}, \frac{l}{N}, \frac{l}{N}, \dots, N \dots \infty]$,

with \rightarrow One , Two ,Three ,,,,,, N ∞ loops \rightarrow and Wave-nodes with $L = \frac{1}{2}\lambda, \frac{2}{2}\lambda, \frac{3}{2}\lambda, \dots, \frac{n}{2}\lambda$

The Energy $\bar{B} = \frac{h}{2\pi} = \text{Spin} = \frac{h.f_1}{w}$ as velocity , $v = (wr)$ in cave , l , is the Spin $\frac{1}{2}$,

while Doubled $\bar{B} = \frac{h}{2\pi} = \text{Spin} = 2 = \frac{h.f}{w} = 2.\bar{B}$, in the same cave , l , then $\rightarrow f = 2.f_1 = f_2$ i.e.

In the same cave , l , Energy is quantized as $\rightarrow \frac{1}{2} / 2 . \frac{1}{2} = 1 / 3 . \frac{1}{2} = 1,5 / 4 . \frac{1}{2} = 2 , \dots n \frac{1}{2} = n.f_1$
and so on , depending on the number , n , of wave-nodes in cave , l , and Energy in , n , fringes is ,

Energy in n = 1 loop $\rightarrow W = [\frac{4\pi r^2}{3}] . f_1$ and for the $n^{th} \rightarrow W = [\frac{4\pi r^2}{3}] . f_n = n \frac{(1+\sqrt{5}).\sigma}{3}$

Total Energy in n = n loops $\rightarrow W = [\frac{4\pi r^2 f_1}{3}] . n.(n+1)$ where $n = 1,2,3,4 \dots n \dots \infty$

The Work is $W = [\frac{4\pi r^2}{3}] . f_1 = [\frac{4\pi r^2}{3}] \frac{(1+\sqrt{5}).\sigma}{4\pi r} = \frac{(1+\sqrt{5})r.\sigma}{3}$ dependent on cave ,r, and Glue-Bond , σ .

It was proved that Energy of wave is , $\rightarrow E = m.\dot{y}^2 / 2 = (m/2).(-wA_o)^2$, and $m = \frac{E}{2r^2.w^2}$ i.e.

Mass in cave ,r, is $\rightarrow m = \frac{E}{2r^2.w^2} = \frac{\bar{B}}{2r^2.w^2} = \frac{W}{2r^2.w^2} = \frac{(1+\sqrt{5})4r^2\sigma}{6r\sigma^2(1+\sqrt{5})^2} = \frac{2r}{3\sigma(1+\sqrt{5})} = [\frac{4\pi r^2}{3}] . f_1 \dots \dots (12)$

i.e. mass is dependent on cave , r , and on first-Harmonic , or and Principal Glue-Bond-Stress, σ and is not any Store in where Energy can be stored . On the contrary , Energy is the motion of the $[\ominus \leftrightarrow \oplus] \equiv [\text{Space} \leftrightarrow \text{Anti-space}]$ charge , as this is the Electrostatic force , in the N loops which as Work can be stored in the ,n, Energy loops of the Stationary Wave of cave , r .

The N loops are the **Energy - Stores in M-P** , and *mass the Reaction* to the **Up - Down oscillatory motion in Loop** of each wave Segment at frequency , f_n , which describe each *mode* characterized by a different λ and f , . The Loop , *Antinode* , vibration gives no appearance of motion along the length of the loop and this because the accelerating motion happens in the Up-Down axis .

Alternative current (AC) is an electric current which periodically reverses direction in contrast to Direct current which flows only in one direction .This happens because of charges alternation i.e. + , - to - , + charges which exists on Antinodes amplitude of oscillation. Since Cycloidal motion in M-P is Isochronous , **The acceleration** , $\ddot{x} = -w^2 \dot{x}$ where $w = 2\pi/T$, **produces the Skin-effect** .

As the acceleration of an electric charge in an alternative current produces waves of Electromagnetic Radiation that **Cancel** the propagation of charges (electrons) towards the axis of the Loop ,the same happens **in Material point** where , **The driving force** $[\ominus \leftrightarrow \oplus \equiv \sigma]$ **on the Up - Down oscillatory motion of Loop is developing , the Amplification factor** , where the weak driving force , σ , causes a powerful motion , **an Electromagnetic Wave whose frequency** $f_p = \frac{(1+\sqrt{5}).\sigma}{4\pi r} = \frac{E}{h}$.

Because of the Skin-Effect **This Electromagnetic Wave** produced from the , **Driving force** $\equiv \bar{B}$, travels with speed velocity . At Rest , this **Stationary-Material -Point** , is absorbed and destroyed , while created when emitted . All above properties of ,**Stationary-Material-Point** , occur in **Photon** .

Energy particles are as $z^{1/w} = |z_0|^{-w}$. $L_v = \rightarrow$ **Energy Monads** and for $\sin.(\varphi+k\pi)/w = 0$ then exists only the Imaginary part of monad , $s=0$, where $\varphi = -2\pi \pm k.\pi$, and then $z^{1/w} = |z_0|^{-w} . e^{i.\varphi} = e^{i.(-2.\pi).b}$ and

it is the **Diffraction Energy mechanism** for all Space Levels of quantization which are particles with least mass only . Extending cave $L_v = e^i \cdot (-2\pi \pm k\pi) \cdot b$ for **minimum acceleration** [31] then *Energy Balanced tank caves for Regulating Valves* , [massive – energy , from $3,56 \cdot 10^{-14}$ to $9,31 \cdot 10^{-28}$ m] , is for base $e = 2,71828$ and $k = 0$ $L_v = e^{i \cdot (-2\pi)} \cdot b$ and then $e^{-31,41593} = 3,56237 \cdot 10^{-14} (m) = r$,

The frequency of Photon with light velocity $v = c = 2\pi r \cdot f$ is $\rightarrow f = \frac{v}{2\pi r} = \frac{3 \cdot 10^8}{2\pi \cdot 3,5610^{-14}} = 1,34 \cdot 10^{21}$ Hz .

From Photon and (12), mass $\rightarrow m = [\frac{4\pi r^2}{3}] \cdot f_1 = 4,18879 \cdot [86,73 \cdot 10^{-56}] \cdot (1,34 \cdot 10^{21}) = 4,868 \cdot 10^{-33}$ Kg

i.e. Photon has a frequency $f_{ph} = 1,34 \cdot 10^{21}$ Hz and mass $m_{ph} = 4,868 \cdot 10^{-33}$ Kg .

On Natural base ,e, and decimal base $b = 10$, the Total Energy is $[z^w = |z|^w \cdot Lo]$, is Stored in the quantized Space $L_0 = 3,56237 \cdot 10^{-14}$, then passing through the Regulating Valves ,[massive energy from $3,56 \cdot 10^{-14}$ m and $9,31 \cdot 10^{-28}$ m] and is quantized as 18 Particles (the Fermions and Bosons) in the Planck's length $L_p = 8,906 \cdot 10^{-35}$ m. which creates all others .

On the same Sub-Spaces and on the same exponential base exist also the infinite , **Spaces - Anti-spaces and Sub-spaces** , in loops . i.e. the infinite monads in one monad .

This is \rightarrow **The How** \rightarrow (by following the Stationary - Wave -Nodes Principle) and ,

The Where \rightarrow (In the first Energy Stationary-monad of Material-Geometry cave) .

The How this \rightarrow (Practically can be succeeded , is left to Laboratory Nuclear Physicists) .

i.e. **In Material – point , Complex - Frequency - Response , $H(w)$, which is an Energy – monad , is composed of the Real – part which represents the Granularity of Energy as Particle , and the Imaginary – part which represents the Wave Energy - Pattern .**

The rotating axis , $l = 2r = KK_1$ in Material–point , creates the Linear vibration of string , l , which is in String $K \equiv [\ominus] \leftrightarrow K_1 \equiv [\oplus]$, and the Natural - frequency , $f_n = \frac{(1+\sqrt{5}) \cdot \sigma}{4\pi l}$ in points K , K_1 or , the Rotational vibration Plan Energy which is , The Spin as $[K \equiv \ominus s^2 \cup K_1 \equiv \oplus s^2] \equiv \bar{B}$.

Above relation of this Plane Work , is the Quantization in Geometry – Shapes , and becomes into the Plane – Stores of Anti-Space and , consists the Unification of Geometry – monads with those of the Energy monads , which Energy-monads is the Work in caves stored as Angular momentum \bar{B} , and Angular velocity Ellipsoids \bar{w} , which was prior analyzed .

In case of Cycloidal rotational motion , which is Isochronous , the acceleration $\ddot{x} = -w^2 \dot{x}$ where $w = 2\pi/T$, produces the Skin-effect from the Up - Down oscillatory motion, and thus developing the Amplification factor causing a powerful motion In-Loop ,and an Electromagnetic Wave Outer Loop travelling with light velocity , c . Above property belongs to Photons .

4.. An analysis of the vacuum Energy :

Galileo`s Principle of Equivalence states that , *Inertial mass* is equal to the *Gravitational mass* and *acceleration* $a = d\bar{v} / dt$ equal to *acceleration due to gravity* , g . [39]

Gravity is the Stationary force $\rightarrow [\nabla i = 2(wr)^2] \leftarrow$ on the base for all motions , which is the

\rightarrow Medium – Field – Material - Fragment, $|\pm s^2| = (wr)^2 = [MFMF] \leftarrow$ in all universe and so ,

Newtonian theory of gravity , acting instaneously between two separated masses is correct .

Maxwell`s equations predict Electromagnetic waves in and out of monads , while Einstein`s equations of GR predict Gravitational waves that travel at the speed of light in order to explain Simultaneity .

GR failed to conceive Gravity force as a Stationary force restraining breakages for monads between the Gravity length cave 10^{-62} and the beyond Planck`s length 10^{-35} .

Let call this in between distance $\rightarrow [10^{-62} -- 10^{-35}] \equiv$ Vacuum.

Breakages acquire different velocities and different energy and because follow cycloid trajectories thus need the same time (isochrones) to reach [STPL] line [59]. Fermat`s Principle of Least time in Isochrones

Principle is embedded in all wavelength, λ , as vector monads.

During Intrinsic Diffraction, $d\bar{s} = \lambda$, of isochronous motion of vectors, frequency, f , doesn't change and only velocity, \bar{v} , and wavelength, λ , changes so from equation $\rightarrow \lambda = \bar{v} T = \bar{v} / f$, $\rightarrow \bar{v} = \lambda f$ and Acceleration $a = d\bar{v} / dt = (d\lambda/dt).f + \lambda(df/dt)$ then $\rightarrow \mathbf{a} = \mathbf{g} = d\bar{v} / dt = (d\lambda/dt).\mathbf{f}$ since $f = \text{constant}$,

or,

Let $\lambda \rightarrow$ be the wavelength of a moving monad,

$t = \lambda / c \rightarrow$ is the needed time to cross length, λ ,

$s = at^2 / 2 \rightarrow$ Deflection due to acceleration, a ,

$H = gt^2 / 2 \rightarrow$ Deflection due to acceleration of, g , and $\rightarrow t^2 = 2. H / g \dots\dots (1)$

For monad $s = \lambda$ then $s = at^2 / 2 = c.T$ where, T is the period of Isochronous displacement and, $t^2 = 2. cT / a \dots\dots(2)$. Equating (1), (2) then $cT/a = H/g$, and since in gravity field the cycloidal motion (Simultaneity) defines the same displacements cT , H then $ct = H$ and so $\mathbf{a} = \mathbf{g}$

Therefore, all particles have the same acceleration, \mathbf{g} , in our gravitational field with frequency unchanged, and \rightarrow velocity, $d\bar{v}$, with wavelength, λ , to be changed so light being a particle also, is deviated in gravity field and, Inertial mass is equal to the Gravitational mass.

i.e. The Necessary and Sufficient Condition for this Equality happens only in **Mass of Material-point**,

where $c.T = H$, of this Isochronous motion where then **Inertial mass \equiv Gravitational mass** \rightarrow

$$m = \frac{2E}{a_a} = \left[\frac{\bar{B} \cdot \bar{w}}{\bar{B} \times \bar{w}} \right] \cdot J = \text{a number, meaning that mass is a Number only, which measures the}$$

Magnitude of any two charges $q_1 \equiv m_1, q_2 \equiv m_2$, or reactions to any change of motion.

In $C \rightarrow$ The Energy Stores in the Material point, is proofed that Energy is stored in the, \mathbf{n} , loops of Monads \equiv Energy Vectors \equiv Quaternion and, **NOT in mass**, with the current concordance model.

$$\text{Energy in } \mathbf{n} = 1 \text{ loop} \rightarrow \mathbf{W} = \left[\frac{4\pi r^2}{3} \right] \cdot \mathbf{f}_1 \text{ and for the } \mathbf{n}^{\text{th}} \rightarrow \mathbf{W}_n = \left[\frac{4\pi r^2}{3} \right] \cdot \mathbf{f}_n = \mathbf{n} \frac{(1 + \sqrt{5}) \cdot \sigma r}{3}$$

$$\text{Total Energy in } \mathbf{n} = \mathbf{n} \text{ loops} \rightarrow \mathbf{W}_{n(n+1)} = \left[\frac{4\pi r^2 f_1}{3} \right] \cdot \mathbf{n} \cdot (\mathbf{n} + 1) \text{ where } \mathbf{n} = 1, 2, 3, 4 \dots \mathbf{n} \dots \infty$$

$$\text{Issuing that Mass} \rightarrow \mathbf{m} \equiv \frac{2E}{a_a} \equiv \left[\frac{\bar{B} \cdot \bar{w}}{\bar{B} \times \bar{w}} \right] \cdot \mathbf{J} \equiv \mathbf{W} \equiv \left[\frac{4\pi r^2 f_1}{3} \right] \cdot \mathbf{n} \cdot (\mathbf{n} + 1) \leftarrow \text{a number } k \text{ as,}$$

$k = T_z =$ Tensor (the length) of vector, $\mathbf{z} \equiv \mathbf{m}$, in Euclidean coordinates and which magnitude is,

$$k = T_z = \sqrt{y_1^2 + y_2^2 + y_3^2 + y_n^2}$$

Remarks :

- 1.. Since mass is dependent on \bar{B} vector which is *clock-wise* or *anti-clock-wise*, the same happens to *Mass - Anti-mass*, or and, *Matter-Antimatter*, meaning that are different entities and, **Anti-mass, Antimatter \rightarrow are counterpart to \rightarrow Mass, Matter**, i.e. with opposite electric charge.
- 2.. Since also, $\pm \bar{B}$ vector, are of opposite direction, **their Sum-Vector is zero**, i.e. mutual annihilation. This Summation of vectors exists at the intrinsic-motion in monads and in Vacuum where Energy as Work is stored in the, \mathbf{n} , Stationary loops of cave.
- 3.. Since also [33], Action (©) of a quaternion $\bar{z} = s + \bar{v} \cdot \mathbf{i} = s + \bar{v} \cdot \nabla \mathbf{i}$ on itself is a Binomial type, $(s + \bar{v} \cdot \nabla \mathbf{i})(s + \bar{v} \cdot \nabla \mathbf{i}) = [s + \bar{v} \cdot \nabla \mathbf{i}]^2 = s^2 + |\bar{v}|^2 \cdot \nabla \mathbf{i}^2 + 2|s| \cdot |\bar{v}| \cdot \nabla \mathbf{i} = s^2 - |\bar{v}|^2 + 2|s| \cdot |\bar{w}r| \cdot \nabla \mathbf{i} = s^2 - |\bar{v}|^2 + [2\bar{w}] \cdot |s| \cdot |r| \cdot \nabla \mathbf{i} = s^2 - |s|^2 + 2|s|^2 \cdot \nabla \mathbf{i}$ { for $s = v = w \cdot r$ } where, $s^2 \rightarrow$ is the real part, **Matter**, of the new quaternion and is **a Positive Scalar magnitude**. $-|\bar{v}|^2 \rightarrow$ is the always negative part, **Anti-matter**, which is always **a Negative Scalar magnitude**. $[2\bar{w}] \cdot |s| \cdot |r| \cdot \nabla \mathbf{i} \rightarrow$ is the double Angular-velocity term, **Energy**, which is **a Vector magnitude**, therefore when Anti-space comes in contact with its regular Space counterpart, they mutually destroy each other and all of their mass is converted to the three above Breakages $\rightarrow s^2, -|\bar{v}|^2, [2\bar{w}] \cdot |s| \cdot |r| \cdot \nabla \mathbf{i}$. In case of Proton and Antiproton annihilate at rest, they produce $10 / 2 = 5$ pions, of which $3/2 = 1,5$ Positive charged, $+|s|^2$, $3/2 = 1,5$ Negative charged, $-|s|^2$, and $4/2 = 2$ neutral $2|s|^2 \cdot \nabla \mathbf{i}$.

In case of Electron and Positron have Kinetic Energy annihilate to an Equivalent-Energy Balance . It was shown [40-42] that in STPL - Mechanism with intrinsic velocity ,v, and under the Thrust of velocity ,c , is created the whole universe with its constituents as ,

A.. [±v̄.s²] → Fermions and → [v̄.∇i] → Bosons , **which are Particles** , with *Inherent Vibration*

B.. [±s²] → [MFMF]- Field = **The Energy - Chaos** , and the binder Energy-Field [∇i] called Gravity force , *without Vibration but only local rotation* .

C.. [±c̄.s²] → Dark matter and the binder Gravity-Force [∇i] , **The Expanding Dark-Energy** [c̄.∇i] constituents which are moving with light velocity ,c, causing the universe to grow.

Since galaxies travel with light velocity then after a collision of galaxies , Dark-matter {DM}≡ [±c̄.s²] is left behind and by bumping into regular matter is get destroyed .

Because Dark-matter {DM} and Dark-energy{DE}≡ [c̄.∇i] , travel with light velocity , cannot be seen using light ,while {DM} interacting gravitationally can be seen through its gravitational effect on other matter and {DE}≡ [c̄.∇i] can be seen as pushing apart galaxies and causing universe to expand at an increasing rate . Because {DE}≡ F is a force and , c , continually acting on matter , then according to Newton`s second law, matter is accelerated so galaxies are accelerated and expanded as →

$$ds = \frac{F}{2m} \left[\frac{1}{f^2} \right] \equiv \frac{F=[\bar{c}.\nabla i]}{2m} \left[\frac{1}{f^2} \right] \equiv \frac{[\bar{c}.\nabla i]}{2m} \left[\frac{1}{f^2} \right] \dots\dots\dots \text{the equation of motion for galaxies .}$$

Any Breakage with non- measurable magnitude is called **Degenerate Matter** .

It was proved that the more general case of free vibration in Material- point , **Linear** [⊕s² ↔ ⊖s²] **or Rotational** [⊕s² ∪ ∪ ⊖s²] in any manner , the solution will contain many of the normal modes and the equation (10) for the displacement can be written as ,

$$y(x , t) = \sum_{n=1}^{\infty} C_n \sin (w_n t) + D_n \cos (w_n t) . \sin(n\pi \frac{x}{l}) \text{ and } w_n = \frac{n\pi c}{l} = \frac{n\pi c}{2r} \dots\dots\dots(10) \text{ where ,}$$

by fitting equation to the initial conditions of y(x , 0) and ẏ(x , 0) , the C_n , D_n , can be evaluated.

Above happens in regular matter that has been compressed until atoms break down and the particles lock into a giant mass as this happens to gas , *that particles are not bound to each other* , and liquid gas , *that particles are packed closely to each other* , and cannot move much.

The difference between , **Vacuum - Energy** [W_{n(n+1)}] **and Dark - Energy** [c̄.∇i] , is that Vacuum [r] **is a Stationary Wave** with Energy W_n in the , n , Loops of the Material point , while Dark - Energy is a **Pushing Kinetic Energy** {DE}≡ [c̄.∇i] , travelling with the → DM-DE ≡ [± s²] , Field ← with the light velocity , c , and the binding Gravity-Force [∇i] **as** , [c̄.∇i] (©) →{ (∇i),(+s²),(-s²),(+cs²),(-cs²) } **i.e.**

The Cause Expansion of the Universe , is the continuous and simultaneous effect ion of Dark-Energy DE=[c̄.∇i] on all Five Energy-Fragments with light velocity c̄ , as [c̄.∇i] →[(∇i),(+s²),(-s²),(+cs²),(-cs²)] which is the rolling Heap . Energy Quantities [∇i = 2(wr)²] , in the rolling Heap , acting on the dipole breakages [± s²] formulate the Gravity-Field and Gravity-Force while acting on dipole breakages [±c̄.s²] formulate Dark matter , DM , and Dark Energy , DE , respectively, while DE acting on Leptons and Quarks , Anti-Leptons and Anti - Quarks , Bosons , formulate the Material worlds.

Since Matter Antimatter destroy each other when they come into contact under normal conditions , shows the way to develop a Mechanism of , **High-Energy-Particles-Beam** , [HEPB] combined with an , [ILP] **Intense-Laser-Pulse** , to Rip-Apart the Under-Planck`s length Vacuum. Since also was shown that Energy is stored in Energy-loops of Stationary waves , *i.e. a Sink-mechanism ≡ Recessional – motion* , so a very Strong Electromagnetic - Field is the suitable mechanism.

It was shown also that the Quality of monads depends on frequency , so all monads can be immediately other monads with different frequency (f) , by following the Breakage rule → s² - |s|² + 2|s|².∇i ← **i.e.**

matter (+) , antimatter (-) , energy (+ -) or *Material Point* $\equiv monad \equiv Dipole \equiv [\oplus \ominus] = \emptyset = K_R AK_{R=T}$ where $\rightarrow K_R \equiv [\oplus] \leftrightarrow K_r \equiv [\ominus] \rightarrow \equiv 0$. Since this Infinite Vacuum is , **a Lattice – Granular - Space , connected by Energy** , i.e. *an Energy Space Universe* , therefore is shown ,The Way of penetration and The How this is succeeded . [39]

5.. Gravitational redshift and Time Dilation : [39]

Gravitational redshift is the Phenomenon where low frequencies of light [long T= 620-750 nm] shifted to red (redshift $\rightarrow f = 400 - 484$ THz) and higher frequencies of light [short T=450-495 nm] are shifted to blue (blue-shifted $\rightarrow f = 606 - 668$ THz) and Time Dilation the opposite Phenomenon for time .

Using the intrinsic property of constant light velocity vector $|\bar{v}|$, which is a Stationary wave in Photon`s wavelength λ , as $\rightarrow \bar{v} = \lambda / T = \lambda.f$ then ,

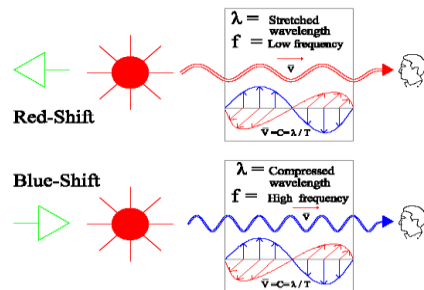
In a **Stress-Strain System** , the State of Principle Stresses , $\pm \sigma$ at each point, is the double refraction in **Photo–Elasticity** and expressed as the Isochromatic lines $[(\sigma_1 - \sigma_2) = J.k/d$ or as Isochromatic surfaces , depending on the direction of force (pressure) which is the same in gravity field as length-contracted and length-expanded in a given piece of quantized space .

Stretching Removal of λ creates , $-\sigma_1$, while , Compressed Removal of λ creates , $+\sigma_1$, and since velocity ,**c**, is constant , long and short period T , or low and high ,f, varies and a vector with Low energy $E = h.f$ is at Red , \rightarrow (**Redshift**) \rightarrow low $f = 400-484$ THz , long $\lambda = 620 -750$ nm and (**Blueshift**) \rightarrow high $f = 606-668$ THz , short $\lambda = 450-495$ nm and High energy since $E = h.f$ at Blue . In this way Light is **s = Particle as Photon** , $s = \lambda = 380 -780$ nm = (3,8-7,8). 10^{-7} m and **as Wave** , the Stationary Electromagnetic fields **E , P = $\nabla i \times Di$ = is of an Wave nature force** where $\nabla i = \bar{v} = \lambda f = \lambda/T$, since Light also = quaternion $\rightarrow [q = s+\nabla i]$.

The Stationary Wave in $s = \lambda$ means that, since Photon is the only Electric Displacement field , $D = \epsilon.E+P$, then in the rate of change is alternately in terms of The Electric field ($\partial P/\partial t$) and The traverse Magnetic field ($\partial E/\partial t$) , i.e. for Low - Energy Redshift and for High energy Blue-shift is then $|s| = \text{as Particle}$. Since also frequency $f = 1/T$ and energy $\bar{v} = E = h.f$, then Cycloidal motion Controls constancy of Energy by changing velocity $\bar{v} = \bar{w} r$, and period , $T \equiv \frac{1}{f}$, of monads .

Relativity failed to explain this reality and to explain the WHY \rightarrow Wave nature , is the Intrinsic Electromagnetic Wave of Particles and speed of light is constant in a Stress - Strain System with (Redshift , as low , f , and Blue-shift as high , f) Photon to be as Particle and also Wave , but considering constancy of light as an axiom from which GR was derived .

Fig-4. Proton , Intrinsic Stationary Wave of a Removal Source F(f) .



Since During Intrinsic Diffraction , $d\bar{s} = \lambda$, of isochronous motion of vectors , *frequency ,f, doesn't change* and only velocity , \bar{v} , and wavelength , λ , changes , so from equation $\rightarrow \lambda = \bar{v} T = \bar{v} / f$, then $\bar{v} = \lambda f$ and Acceleration $a = d\bar{v} / dt = (d\lambda/dt).f + \lambda(df/dt)$ i.e. $\rightarrow \mathbf{a} = \mathbf{g} = d\bar{v} / dt = (d\lambda/dt).f$ \leftarrow and Since also The Total-Energy of a Photon is conserved in the Energy-Storages of , λ , which are the quantization of frequencies as the harmonics f_1 , f_2 , \dots , f_n of , *cave \equiv recession* $\lambda = 2.r \equiv n$ loops ,

Therefore the Photos emitted by a nebula lose energy on their journey to the observer by any effect , leads to a decrease in frequency , i.e. *Intrinsic Red-Shift* .

Since Total energy is conserved and happens decreasing in frequency then from formula $E = h.f = \frac{hc}{\lambda}$, λ , is increasing , i.e. **corresponds to an increase in light's wavelength** $\lambda \equiv [f_1 , f_2 , , f_n \equiv n \text{ loops} \equiv \equiv \text{lobes following the } \textit{Stationary-Wave-Nodes Principle}$] .

In this way Total-energy is conserved as the hedgehog in its shell because differently *< tired light >* should be annihilated .

It was shown [58-59] Black-holes, *the quasars*, exist in the centers of galaxies and are the beacons for astronomers and consist the **Recycled Space machines** of the Universe.

4a.. Numeric Analysis :

Planck constant , $h = 6,62606957 \cdot 10^{-34}$ joules , $1 \text{ eV} = 1,602 \cdot 10^{-19} \text{ J}$

Light velocity $c = 2,998 \cdot 10^8 \text{ m/s}$, $1 \text{ THz} = 10^{12} \text{ Hz}$, $1 \text{ nm} = 10^{-9} \text{ m}$, $1 \mu\text{m} = 10^{-6} \text{ m}$

Total-Energy $E = h.f = \frac{hc}{\lambda} = \frac{6,62606957 \cdot 10^{-34} \cdot 2,998 \cdot 10^8}{\lambda} = 1,99 \cdot 10^{-25} \text{ m} \cdot (10^6 \mu\text{m}/\text{m}) = \frac{1,2398}{\lambda(\mu\text{m})} \text{ (eV)}$

and for redshift $\rightarrow f = 400 \text{ THz} = 400 \cdot 10^{12} \text{ Hz} = 4 \cdot 10^{14} \text{ Hz}$ then corresponds a light's wavelength

$\lambda = \frac{c}{f} = \frac{2,998 \cdot 10^8 \text{ m/s}}{4 \cdot 10^{14} \text{ Hz}} = 7,495 \cdot 10^{-7} \text{ m} (10^6 \mu\text{m}) = ,07495 \mu\text{m}$ and Total-Energy $E = \frac{1,24}{\lambda(\mu\text{m})} \text{ (eV)} \dots(a)$

$E_R = \frac{1,24}{0,7495} = 1,6542 \text{ eV} = 2,65 \cdot 10^{-19} \text{ Joules} .$

Because Photon may have any wavelength and also that of Planck cave $1,616 \cdot 10^{-35} \text{ m}$ then

Energy $E_P = \frac{1,24}{1,616 \cdot 10^{-35+6}} = 7,673 \cdot 10^{29} \text{ eV} = 1,229 \cdot 10^{21} \text{ Joules} .$ The difference in Energy is

$E = E_P - E_R = 7,673 \cdot 10^{29} \text{ eV} = 1,229 \cdot 10^{21} \text{ Joules} ,$

i.e The Energy - Stores of Photon are always full of Energy \equiv Motion Up - Down following on wavelength , The Stationary Wave - Nodes Principle.

Extending quantization of Space and Energy according to exponential formula for acceleration ,

Planck's Length $L_S = e^{-i \cdot (-\pi + k\pi) \cdot b} = e^{-i \cdot \pi \cdot (k-1) \cdot 10} , \text{ then } , e^{-(29,933606)} ,$

For base $e = 2,71828$ and base $b = 10$ then $e^{-(29,933606)} = 1 \cdot 10^{-13} \text{ m Particles length}$

For base $e = 2,71828$ and $k = 0$ then $L_S = e^{i \cdot (-\pi) \cdot b} = e^{-i \cdot (-31,41593)} = 3,56237 \cdot 10^{-14} \text{ m}$

For base $e = 2,71828$ and base $b = 10$ then $e^{-(32,236191)} = 1 \cdot 10^{-14} \text{ m Particles length}$

For base $e = 2,71828$ and base $b = 10$ then $e^{-(92,103404)} = 1 \cdot 10^{-27} \text{ m Particles length}$

For base $e = 2,71828$ and $k = 1$ then $L_S = e^{i \cdot (-2\pi) \cdot b} = e^{-i \cdot (-62,83185)} = 9,31289 \cdot 10^{-28} \text{ m}$

For base $e = 2,71828$ and base $b = 10$ then $e^{-(94,405989)} = 1 \cdot 10^{-28} \text{ m Particles length}$

Minimum Acceleration happens for Particles in , **Cave \equiv Recession \equiv Wavelength** , where then Energy ,

Energy $E_a = \frac{1,24}{3,56237 \cdot 10^{-14+6}} = 3,481 \cdot 10^7 \text{ eV} = 5,576 \cdot 10^{-10} \text{ Joules} ,$ while Redshift Energy happens

$E_R = \frac{1,24}{0,7495} = 1,6542 \text{ eV} = 2,65 \cdot 10^{-19} \text{ Joules} . [31]$

It was prior referred that , when Matter and Antimatter annihilate at rest or when Anti-space comes in contact with its regular Space counterpart , they mutually destroy each other and all of their Energy is converted to the *Three Breakages* $\rightarrow s^2 , -|\bar{\mathbf{v}}|^2 , [2\bar{\mathbf{w}}] \cdot |\mathbf{s}| |\mathbf{r}| \cdot \nabla \mathbf{i} \leftarrow$ and for , $\bar{\mathbf{v}} \equiv \mathbf{s} \equiv \mathbf{r} = \text{the cave} , \text{ then}$

$$\rightarrow s^2 , -s^2 , 2[\bar{\mathbf{s}}]^2 \cdot \nabla \mathbf{i} \leftarrow \quad [58]$$

Because Pure energy happens at $s = 0$ then $2[\bar{\mathbf{s}}]^2 \cdot \nabla \mathbf{i} = 0$, i.e. $\nabla \mathbf{i} = 0$ or $[\nabla \mathbf{i}]^2 = 0$, meaning that Energy

as Matter is moving perpendicularly to Anti-matter without annihilate each other . Photon is a Particle in all Levels of Energy-magnitudes , and thus traversing gaseous-media of any temperature is experiencing redshift without losing Energy. Star - light passing near the Sun is bending because of its refraction in the dense-Sun , and of Newton`s gravitation .

In case of Redshift , Energy is squared as $E_a^2 = E_R$ or $[5,576. 10^{-10}]^2 = 31,09 . 10^{-20} = E_R = 3,109. 10^{-19}$ Jouls corresponding to a Redshift $\rightarrow f = 404$ THz . markos 11 / 2 / 2018 .

6.. **Dark – Matter , Dark – Energy** : [43]

Dark-matter becoming from the center ,O, of Common-circle where there , $v = 0$, and is $(\pm c.s^2)$ moves with the constant light velocity , \bar{c} , and is composed of the two opposite signed elements , $(+cs^2)$, $(-cs^2)$, and Dark - Energy $[\bar{c}.\nabla i]$ moves also with the same velocity of light , so is continually effecting **on the two** fragments separately and are slinging them further , formulating the attracting , *the mixture of the spherical opposite signed elements* , highlights , **while** dipole , form the heavy and massive invisible dark matter which repel , *the dipole energy blobby volumes as the massive Dark – Fringes* . The parallel motion of this mixture , *not parallel universes* , is the rolling on Gravity field as the *Base of expanding*.

The [**Geometrically Rolling , Moved mixture DM-DE**] Expansion for constructing universe.

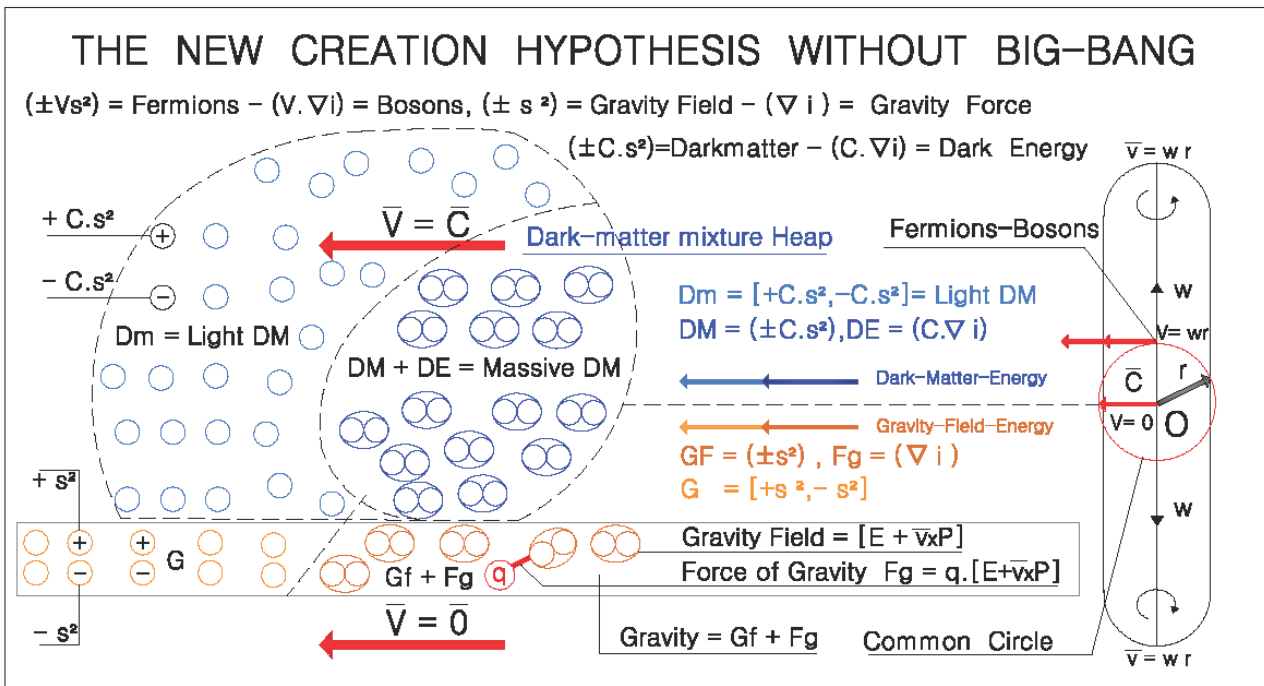


Fig-5. The Cause Expansion of the Universe , is the continuous and simultaneous Rolling of mixture Heap [DE-DM] , *The Fragments Heap* , on the Rest Gravity-field $[G_f + F_g]$ as the Base of rolling.

The three properties of Dark-matter $[DM] \rightarrow [(+c.s^2), (-c.s^2), (\pm c.s^2)]$ and Dark-energy $[DE] \rightarrow [\bar{c}.\nabla i]$ Since $[DM] = \pm \bar{c}.s^2$, is of opposite signed (\pm) , then consists the Dipole , $[|+c.s^2| \leftrightarrow |-c.s^2|] = |\lambda| \equiv [|+c.(\bar{w}.r)^2| \leftrightarrow |-c.(\bar{w}.r)^2|]$ of Dark matter which is a more massive base than that of gravity , *and this because of, c* , so issues DM field $= [E_m + \bar{c}.P_m] = [c. E_g + \bar{c}^2.P_g]$ and as this is also a Stationary field then follows equation $E_m = 2.A.c.\sin(\frac{2\pi}{\lambda}).\cos wt$ where $P_m \perp E_m$. Since also the tiny volume of $|\lambda| \equiv [|+c.s^2| \leftrightarrow |-c.s^2|]$, consists a , *sink* , then DM attracts and it is an infinite ocean in all universe . Since also dark energy is effecting then , $DE = q . [E_m + \bar{c}.P_m]$ align with the field , so on $[DM]$ dipole $[E_m + \bar{c}.P_m]$ exist also a torque (τ) and in this way $[DE]$ repels.

Dark-energy $[\bar{c}.\nabla i]$ acting on the three constituents of $[DM] = [(+c.s^2), (-c.s^2), (\pm c.s^2)]$ separately and being also a non-uniform field, then is not canceled but is a pushing force, **DE is influencing as an expansion of the universe**. Because $[DE]$ is a stationary force on $[DM]$, so is exerting a very strong gravitational pull on gravity field (participates in gravity). Action of Dark matter, Dark Energy is,

$$[DE] \odot [DM] \equiv [\bar{c}.\nabla i] \odot [DM] \rightarrow [\bar{c}.\nabla i].(+c.s^2), [\bar{c}.\nabla i].(-c.s^2), [\bar{c}.\nabla i].(\pm c.s^2) = [\bar{c}.\nabla i].[+c.s^2 \leftrightarrow -c.s^2],$$

and Results to,

- 1.. $DM \rightarrow [+c.s^2 \leftrightarrow -c.s^2]$ attracts and $DE \rightarrow [\bar{c}.\nabla i]$ repels and not competing.
- 2.. DE is exerting a pull and gravitational pull on all visible matter on the largest cosmic scale of universe.
- 3.. DE by exerting pull on $DM \rightarrow [\bar{c}.\nabla i].(+c.s^2)$ and on $[\bar{c}.\nabla i].(-c.s^2)$ *highlights*, and on $\rightarrow [\bar{c}.\nabla i].[+c.s^2 \leftrightarrow -c.s^2]$ the Darkness which is the tiny energy volume consisting the dipole of dark matter, *and formulates the massive Dark Fringes and this because are not particles.* [41]
- 4.. DM and DE are not visible because both travel with light velocity and so light is not interacting with them. Light, photon, *which is a particle and wave*, is interacting with the Rest Gravity field and all others with less velocity and so are detectable. Only velocities greater than that of light, *or a New simultaneity mechanism*, can make them visible.
When Anti-matter annihilates with matter, gamma rays are produced, because Energy is converted to the *Three Breakages* $\rightarrow s^2, -s^2, 2[\bar{s}]^2.\nabla i \leftarrow$, **the Breakage Principle**, and because in Energy-space continuum remains only the energy while DE acting on DM fragments $[+c.s^2], [-c.s^2]$ formulates the massive compact spherical objects and the massive compact anti-spherical Anti-objects.
- 5.. Because of the DM and DE structure, which is breakages and force, collision of galaxies does not predict stars to be smashed into others. As above are created the, *gas clouds*, which are smashed into the other and get heated and so be a visible effect.
- 6.. Because light is a particle with velocity, c , interacts with the REST gravity field by the Gravity force while DM, DE having the same velocity have a parallel motion, *not parallel universes*, which cannot see it. DE has exactly the same effect as that of a very small constant vacuum energy MFMF field. Energy density of the Rest base MFMF is that of gravity, I_g , while of the Moving DE, DM is that of, $c.I_g$, so in this way occurs expansion of the universe. GR being confined in Planck's length L_p , *could not see the whole Energy-space beyond this length and the way and how could expansion occurs.* Cosmological constant is the value of the energy density of the vacuum in the tiny space, without describing the how this tiny volume is expanded, so why to presume this as constant ..?.
The answer is that, this was then introduced just to surpass the problem. [41]
- 7.. Because DM, DE consist a not homogeneous Heap of mass distribution (anomalous mass) and permeate the whole universe is causing what is said, the expansion of the universe to accelerate without any Big-Bang explanation and any other mysteries force. The motion of this DM, DE, *mixture of the spherical opposite signed materials and dipole energy blobby volumes*, is not in contrary to gravity F_g , because both have already passed from the center of STPL contracted mechanism.
Gravity field is the Rest-Base of all universe which doesn't exist apriori but is the Base, *the carpet* on which *the DE-DM Heap mixture*, with the same velocity, c , is rolling, *expanding*, with the maximum constant velocity, c , and continually formulating the, **Zero \rightarrow a Number \rightarrow Infinite \rightarrow Geometrical Universe**, Energy density of base.
- 8.. Black Holes are gravitational wells, *caves*, in $[MFMF]$ - Field \equiv **The Energy - Chaos**, so any next constituent is dissipated or collapsed, swallowed. Following above analysis it is a kind of mechanism which is source of energy and because of conservation of energy law, Black-holes, *the quasars* exist in the centers of galaxies and are the beacons for astronomers and consist the **Recycled Space machines** of the Universe. DE, DM being also *constituents* are also recycled in Black-holes. The why are embedded in DM is a problem of stability and conservation of space and energy. Black-hole growth is connected.

9.. The principle of Virtual Work is the energy method for static procedure of interconnected Systems of material points or bodies of higher DOF and associated with the equilibrium of them and may be stated as follows

<If a System in equilibrium under the action of a set of Forces is given a virtual displacement the virtual Work done by the Forces will be zero , and the opposite , *The virtual work done by the forces is zero for any equilibrium System under the Action of a set of forces* > . In case of two material points the static procedure is , *the Virtual work done by two forces is zero , for a dual equilibrium system which results to the equality of opposite signed forces.*

5.1. *The New Creation Hypothesis is Summarized as follows F- 5 :*

- a... From Nothing (*i.e. the Point*) to Existence (*i.e. to be another Spherical Point*) issues the Zero Virtual work law, where zero Work is the equilibrium of two equal and opposite forces on points . Thus Space [S] is *the Point* and Anti-space [AS] is the *Other Point* . Infinite points are between , *the Point* and *Other Point* , and between the Infinite points also which consist the Primary Neutral Space [PNS] as $[\nabla \mathbf{i} = 2(\mathbf{wr})^2] \times [\pm \mathbf{s}^2]$.
- b.. Work as , *Opposite forces* , exist on the infinite points between , *the Point* , and , *the Other Point* , which Opposite forces with different lever-arms exert the equal and opposite Momentums which equilibrium , *as Work $\mathbf{W}_{n(n+1)}$, which is zero.*
- c.. Opposite Momentums are only in the Rest curl Energy volumes differently would not be rest . This inverse vortical motion results to velocity vectors collision which are so crushed into three Energy-Fragments , and after clashed with the velocity vectors \bar{v}, \bar{c} are thrown OFF , *the curl Ellipsoid Energy volume (the Absolute System)* , and through an Anti-diffused geometrical mechanism again in new Energy-Volume (*the Relative System are the parallel Inertial systems*).
- d.. This Anti-diffused mechanism drives all clashed fragments , **either** through the *Centre of Common circle curl Ellipsoid forming the Rest Gravity Field - energy and the Movable Dark Matter - Energy*, **or** through the *Tangents on Circumference of Common circle curl Ellipsoid and forming the Movable Particles – Antiparticles – Bosons* , **to** an Simultaneity Relative and cylindrical volume.
- e.. In this cylindrical volume , which are the parallel inertial systems , **is the Rest Gravity Field – Energy as the Base carpet** ,for **The Movable Dark Matter-energy** and for all Formation in *Rest or Movable* , **by Pulling and Repelling and also all** moving Particles–Antiparticles and Bosons, on where are applied laws of Chemistry and Physics.

Mechanically :

The principle of Virtual Work is the motion of a force ,P, executed on a point A to reach point B, so , A force acting on point A (*which is Nothing*) reaches point B (*which is also Nothing*) , i.e. stability of the system A-B is obtained by the equal and opposite forces acting on points A , B . On the infinite points between the two infinite and opposite forces are also acting on them resulting to a , *Whirling on a line* , perpendicular to A-B axis.

Because of Unbalance of Whirling ,*it is a common source of vibration excitation* , the Rotating unbalanced , is represented by an angular velocity ,w . The rest system of this opposite Whirling Energy , *vortices* , exists in the vibrating Ellipsoid volume which is a geometrical cave . This inverse vortical motion (w , - w) , in cave results to velocity vectors collision which are crushed into fragments, and after clashed with the velocity vectors are thrown , OFF this *curl Ellipsoid Energy volume (the Absolute System)* , through an Anti-diffused geometrical mechanism to a new energy volume (*the rest Relative System*).

Fragments through , **The Centre** (where $v = 0$) of the *Common circle Ellipsoid* , **form The Rest Gravity Field-energy** and the *Movable Dark Matter - Energy* , and through **The Tangent** (where $v = v$) on the *Circumference of the curl Ellipsoid circle* , **form the Movable Particles – Antiparticles – Bosons** , to an Simultaneity Relative cylindrical volume. All movable elements are formulated , *by Pulling or and Repelling* , **i.e.**

all moving Particles–Antiparticles and Bosons and all their producing's , on where laws of Chemistry and Physics are applied , and because energy $[\nabla i]$ as ,

Dark Energy $DE \equiv [\bar{c}.\nabla i]$ (©) \rightarrow Acting on the Five Constituents $\rightarrow [(\nabla i),(+s^2),(-s^2),(+cs^2),(-cs^2)]$

$[\nabla i],[\pm s^2] \rightarrow$ MFMF Field $[\nabla i],[\pm \bar{c}.s^2] \rightarrow$ DM-DE Field , of Dark matter and Anti-matter.

$[\nabla i],[\pm \bar{v}.s^2] \rightarrow$ Fermions $[\nabla i],[\nabla i] \rightarrow G_f =$ Gravity-Force in DM-DE Field .

$[\nabla i],[\bar{v}.\nabla i] \rightarrow$ Bosons , $[\nabla i],[\bar{c}.\nabla i] \equiv DE \rightarrow$ Dark Energy

$c \times$ (©) $[\nabla i] \rightarrow$ Gravity Force $DE \equiv [\bar{c}.\nabla i] = \bar{c} [\nabla i] =$ The Travelling-Energy with ,c, velocity.
And also

Regular Matter. $\rightarrow \ominus s^2 \equiv$ Electron , $\oplus s^2 \equiv$ Proton , $[\ominus s^2 \cup \cup \oplus s^2] \equiv$ Neutron \cup

Anti - Matter $\rightarrow + \ominus \equiv$ Positron , $- \oplus \equiv$ Anti-Proton , $[\ominus s^2 \cup \cup \oplus s^2] \equiv$ Neutron \cup

Dark - Matter $\rightarrow [+ \bar{c}.s^2] \equiv$ Matter , $[- \bar{c}.s^2] \equiv$ Anti-Matter , $[\bar{c}.\ominus s^2 \cup \cup \bar{c}.\oplus s^2] \equiv \pm$ Matter

Dark - Energy $\rightarrow [+ \bar{c}.\nabla i] \equiv$ Energy , $[- \bar{c}.\nabla i] \equiv$ Anti-Energy , $[\bar{c}.\ominus \nabla i \cup \cup \bar{c}.\oplus \nabla i] \equiv \pm$ Spin

Degenerate-Matter $[+ \bar{v}.s^2] \equiv$ D-matter , $[- \bar{v}.s^2] \equiv$ D-Anti-Matter, $[\bar{v}.\ominus s^2 \cup \cup \bar{v}.\oplus s^2] \equiv \pm$ D-matter

6.. The Total - Energy in loops :

It was shown in [58] that the maximum velocity in a closed system occurs in Common circle , when the the two velocities , \bar{c} , \bar{v} are perpendicular between them , and are not producing Work , from where then dispersion follows Pythagoras theorem and the resultant Quantized linear Space length ,r, becomes , as

the Resultant of Energy Vectors , $r = |(\bar{c}.\bar{T})| = \sqrt{v^2 + c^2}$ and by using Space Vector $\bar{r} = |(\bar{c}.\bar{T})| = \sqrt{v^2 + c^2}$

then , The total Rotating energy is $\rightarrow \pm \bar{\Lambda} = \bar{p}.r = (M.c).r = (M.c). \sqrt{v^2 + c^2}$ and squaring both sites

$$[\pm \bar{\Lambda}]^2 = p^2.r^2 = M^2.c^2.(v^2+c^2) = (M^2.v^2).c^2 + M^2.c^4 = (p^2.c^2) + M^2.c^4 = [p.c]^2 + [m_0.c^2]^2 \text{ or}$$

$E_T = E_R + E_K \rightarrow$ Total - Energy of Elementary- particle = Intrinsic Rotational + Kinetic Energy,

The velocity of Elementary particles is the light velocity $c = v = 2\pi r. f_e$ and frequency $\rightarrow f_e = \frac{c}{2\pi.r} \dots(a)$

$$\text{Rotational Energy } E_R = \bar{B} \cdot \bar{w} = 2L = J.w^2 \text{ and } \rightarrow E_R = \left[\frac{\pi r^4}{8} \right] \cdot \left[\frac{c^2}{r} \right] = \frac{\pi c^2}{8} r^2 = 3,534.10^{16} \cdot r^2 \dots\dots\dots(b)$$

Energy and frequency of Elementary particles can be found from cave r , only since ,c, is constant .

$$\text{Total - Energy } \rightarrow E_T = E_R + E_K = \frac{\pi c^2}{8} r^2 + \frac{1}{2} m.v^2 = 3,535.10^{16} \cdot r^2 + \frac{1}{2} m.v^2 \dots\dots\dots(c)$$

Mass of elementary particles is $m = \frac{E}{2r^2.w^2} = \frac{J.w^2}{2} \cdot \frac{1}{2r^2.w^2} = \frac{J}{4.r^2} = \frac{\pi.r^2}{16}$, i.e. dependent on radius of cave.

Remark :

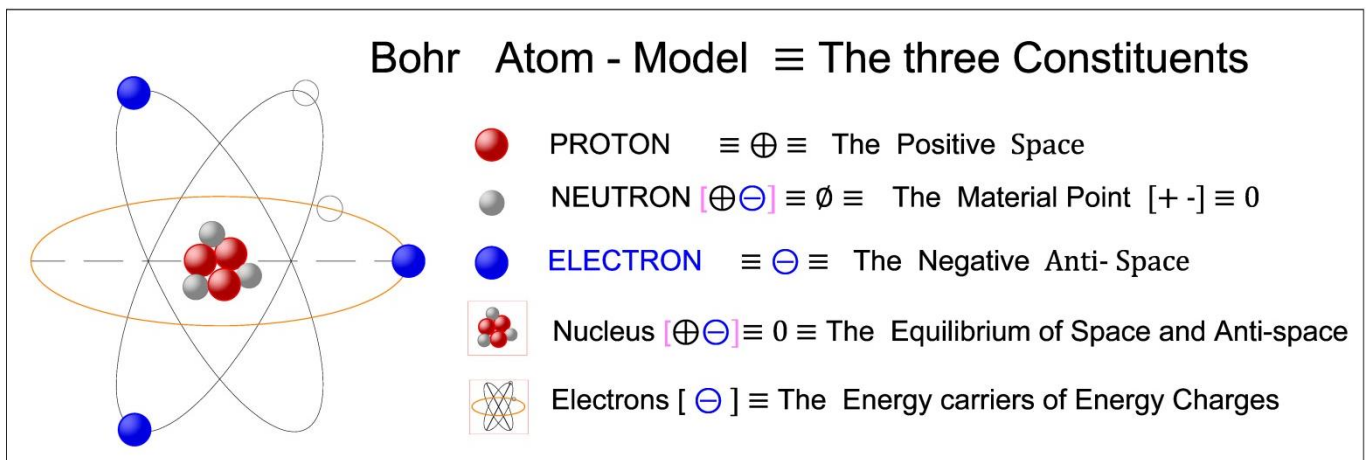


Fig-6. Proton , in Bohr-model , consists the \rightarrow Positive Breakage (+) of the three constituents , Electron consists the \rightarrow Negative Breakage (-) of the three constituents ,

Neutron consists the → Equilibrium Material Point (+ -) of the Spaces and Anti-spaces .
 Nucleus consists the → Equilibrium Positive Breakage Store , in Atom –Model
 Electron Orbits are the → Equilibrium Negative Breakage Stores in Atom -Model
 Orbital Electron is the → Moving-Charge-carrier of Energy in Atom –Model

It was prior referred that , when Matter and Antimatter annihilate at rest or when Anti-space comes in contact with its regular Space counterpart , they mutually destroy each other and all of their Energy is converted to the *Three Breakages* → s^2 , $-|\bar{v}|^2$, $[2\bar{w}].|s| |r|. \nabla i \leftarrow$ where for , $\bar{v} = s \equiv$ the cave ,
 $[s^2]$ → is the Real part , **Matter** , of the new monad , and is **a Positive Scalar magnitude** .
 $-[s^2]$ → is the always Negative part , **Anti-matter** , which is always **a Negative Scalar magnitude** .
 $2s^2.\nabla i$ → is the double Angular-Velocity Term , **The Energy Term** , which is **a Vector magnitude** .

Since **Energy is motion** and the **Total - Energy of Elementary - Particle** is equal to the → **Intrinsic Rotational + Kinetic Energy from velocity** , then according to the conservation law of Energy , **This Energy is stored into Neutral caves as Stationary Loops** , and thus producing the **Space and the Anti - Space Particles with velocity vector the remaining of the Energy Term** . Motion is obtained either by Pushing or Attracting .

Both cases presuppose **NOT the Continuity of points** , which points are nothing **But Discontinuity** , **Discrete** , with the dimensional Units as filling as this was shown in Zenon Paradox [65]
Elementary Particles and Antiparticles consist the Energy-Stores for a part of the Total –Energy , **because of their way of existence** , while their **Velocity - Vector** , is the rest part of Energy.
 Pushing , **Repulsion** , happens in Attractive Electric Fields where a Positive charge is dropped near another Positive charge or a Negative charge is dropped near another Negative charge.

Attractive , happens in Static - Electricity where there exists a Build-up of opposite charges on objects which are separated , **gathered and remaining at rest** , by an Insulator and balance the system out , OR an Electric field which is a large source of Negative charges that can propel electrons which Attractive Electric Fields will flow through a circuit towards positive charges. In Fig-6. Atoms exist in over Two hundred different forms as chemical elements like Hydrogen , Carbon , Oxygen Copper etc. [54-55].

Atoms of many types can combine to make molecules which built the Matter – Antimatter and energy (motion) we can physically see and touch. Atoms are tiny about 300 picometers long equal to $3.10^{-10}m$
 An Atom is built with a combination of the three distinct particles , the Protons Neutrons and Electrons i.e. define Protons \equiv **The Space** , Neutrons \equiv **The Material point** , Electron \equiv **The Anti-space** , and as was seen before → **Energy \equiv Motion \equiv Space + Anti space + Kinetic Energy** , therefore the above combination is completed with a Structural–Lattice–Design , which is the Bohr Atom-model , i.e. A core nucleus , of Protons and Electrons , surrounded by orbiting Electrons . Since the Structural design must be stable (**balanced state**) in all parts , therefore nucleus is combined of Protons and equal Neutrons determined the isotope of an atom , which define the equilibrium of **Space Anti-space**.

The Kinetic Energy Part (Energy) is stored in Orbits as bounded orbiting electrons .

In order that Energy , **motion** , is stored somewhere else then in the outer orbit of the atom , the Valence electrons with enough outside force may escape orbit of the atom and become free. These free electrons are the charge carriers (**Dimensional units as filling**) because Energy is motion and is quantified as the charges which these have . We refer that energy as charge is the same either for Space and Anti-space as this is $[\oplus \leftrightarrow \ominus]$, therefore Protons and Electrons carry the same amount of charge and so in Bohr model for stability , balanced state ,atoms have the same number of electrons and protons . **Breakage Principle. Potential energy** , is the stored energy where then the Build-up of the opposites is at rest .The same also the Electric Potential Energy where a charge`s Electric potential Energy describes the how much stored energy it has when is set into motion and that energy is kinetic and charges can do Work . [67]

Why Rotational energy $\bar{\Lambda}$ is Elastically damped in monad $\lambda_2 = 10^{-35}$ m as \rightarrow mass m , velocity \bar{v} angular velocity \bar{w} , and finally as a Constant Frequency f , which is dissipated in the fundamental particles (Fermions and Bosons) by altering the two variables , velocity \bar{v} and wavelength λ , only ? Since monad (\bar{AB}) = **quaternion** = \bar{z} and the , w , Spaces and , $1/w = w^{-1}$, Sub-spaces are monads in , w , power and , w^{-1} , the root which represent the Regular Circumscribed and the Regular Inscribed Polygons in monad \bar{AB} then quaternion $z^w = \bar{z} = s + \bar{v} = s + \bar{v}.i = s + [v_1 + v_2 + v_3].\nabla i = s + \bar{v}\nabla i$, where s = the Scalar part , and

$$\bar{v} = [v_1 + v_2 + v_3] \text{ the Imaginary part of it , equal to } \bar{v}\nabla i \quad [25] \text{ and then becomes}$$

$$\rightarrow z^w = (s + \bar{v}\nabla i)^w = [z_0 \cdot (\cos \varphi + i \sin \varphi)]^w = |z_0|^w \cdot (\cos w\varphi + \varepsilon \sin w\varphi) = |z_0|^w \cdot e^{i.w\varphi} , \text{ where}$$

$$\rightarrow |z_0| = \sqrt{s^2 + v_1^2 + v_2^2 + v_3^2} , \varepsilon = [v_1.i + v_2.j + v_3.k] / [\sqrt{v_1^2 + v_2^2 + v_3^2}] , \cos \varphi = \frac{s}{|z_0|} \text{ and}$$

$$\rightarrow z^{1/w} = (s + \bar{v}\nabla i)^{1/w} = |z_0|^{-w} \cdot [\cos(\varphi + 2k\pi)/w + i \sin(\varphi + 2k\pi/w)] = |z_0|^{-w} \cdot e^{i(\varphi + 2k\pi)/w}$$

where z^w = The Space , and $z^{1/w}$ = The Anti-space of Monad \equiv Quaternion \bar{AB} .

$$\text{Rotational Energy } E = \bar{\Lambda} = m\bar{v}.r = (m\bar{v}).\lambda/2 = (m.w\lambda/2).\lambda/2 = (mw).\lambda^2/4 = (m.2\pi f).\lambda^2/4 = f.[m\pi.\lambda^2/2].$$

$$\text{Total Energy } E \text{ in } k_2 = |\bar{\Lambda}|\lambda = (m\bar{v}).\lambda^2/2 = (m.w\lambda^2/2).\lambda/2 = (mw).\lambda^3/4 = (m.2\pi f).\lambda^3/4 = f [m\pi.\lambda^3/2] .$$

$$\text{From equation of Work = Energy } E = P d\bar{s} = P \cdot \bar{v} \cdot dT = P \cdot \bar{v} \cdot (2\pi/w) = P \cdot \bar{v} \cdot (2\pi/2\pi.\lambda) = P \cdot \bar{v} / \lambda = hf = h(\mathbf{v}/\mathbf{L}) \text{ i.e.}$$

during diffraction , $d\bar{s}$, frequency , f , doesn't change and only the velocity , \bar{v} , and wavelength , λ , changes

Diffraction $d\bar{s}$, maybe on any Quantized Space-monad (*quaternion*) **and in Planck Length L_p but how ?**

Work is embodied in the three perpendicular regions k_1, k_2, k_3 , as the **rotating Energy $\bar{\Lambda}$** on dipole

$$\bar{AB} = A \leftrightarrow B = d\bar{s}_1, d\bar{s}_2, d\bar{s}_3 , \text{ in the Configuration of co variants } \bar{\Lambda}, d\bar{s}, \text{ with constant } C = 4. \bar{\Lambda} d\bar{s} / (\pi w \lambda^2)$$

which exists simultaneously as the Equation of Quaternion \rightarrow Space $d\bar{s} = \bar{z} = [s + \bar{v}.\nabla i] = [s + \bar{v}.i] =$

$$\text{Work = Total Energy = TE} = [\Lambda \nabla + \bar{\Lambda} \times \nabla] = \sqrt{[m.v_E^2]^2 + [\Lambda.v_B + \bar{\Lambda} \times v_E]^2} = \sqrt{[m.v_E^2]^2 + T^2} =$$

$$\sqrt{[m.v_E^2]^2 + |\sqrt{p_1 v_{B1}}|^2 + |\sqrt{p_2 v_{B2}}|^2 + |\sqrt{p_3 v_{B3}}|^2} = (\bar{z}_0)^w = (\lambda, \Lambda \nabla i)^w = (\bar{z}_0)^w \cdot e^{[\bar{v}.w\theta]} =$$

$$(\bar{z}_0)^w \cdot e^{[\bar{\Lambda} \nabla i / \sqrt{\Lambda} \cdot \bar{\Lambda} [\text{Arc Cos}(\frac{w|\lambda|}{2|\sqrt{\bar{z}'_0.z_0}|})]} \dots\dots\dots (TW)$$

Nature has not any < meter > to measure quantized quantities (of Space and Energy) except these of the Geometry constants , one of which is number , π , (Archimedes number π) so quantization of Points (λ) follows geometry constant (π) and for Energy W_d , which is the quantized Energy of the Quantity dissipated per cycle , [and this because monads follow sinusoidal oscillation on wavelength = monads as the w .th power and the n .th root of this monad where $w.n = 1$ as above on and in the same monad] and which energy is $\rightarrow W_d = (mw).\lambda^2/4 = (2m\pi f).\lambda^2/4 = (m\pi.\lambda^2/2).f = C.f$, i.e.

From above monads $(s + \bar{v}\nabla i)^{1/w} = |z_0|^{-w} \cdot e^{-i(\varphi + 2k\pi).w}$, where $\cos \varphi = s / |z_0|$, and for Rotated Energy case where $s = 0$, and also $\cos \varphi = 0$ exists for angle $\varphi = \pi/2$, the quaternion $(s + \bar{v}\nabla i)^{1/w}$

as dimension power $\rightarrow w = b \leftarrow$ and for $k = 1$ becomes , $e^{-i(\pi/2 + 2k\pi).w} =$

$$e^{-i(\pi/2 + 2k\pi).b} = e^{-i(5\pi/2).b} = e^{-i(5\pi/2).10} \text{ and for Planck length } L_p = e^{-i(5\pi/2).10} \dots\dots\dots (P_1)$$

Equation (P₁) , is the basic Geometrical interpretation of the < Planck scale meter > based on the two **Geometry constants e , π** where $k = 1$, and **base b = 10** , and this from logarithm properties with different bases on the same base **e** as this is ,

$$e^w = [b^{\log_b(e)}]^w = b^{w \cdot \log_b(e)} \text{ and because } \sqrt[w]{e} = e^{1/w} = e^{-w} = x^{1/w \cdot \log_b(e)} \text{ which are monads in}$$

monads, and is therefore of Wave motion with angular velocity $\mathbf{w} = 4 W_d / (\pi \cdot C_o \cdot \lambda^2)$, [5-4] i.e. Space and Energy is quantized and measured on the two Constant and Natural numbers e, π . where for base the natural logarithm, e , and exponent the decimal base, $b = 10$, then is \rightarrow

For base $e = 2,71828$ and base $b = 10$ then $e^{-(78,2879)} = 1 \cdot 10^{-34} \text{ m}$ **The answer**

For base $e = 2,71828$ and base $b = 10$ then $e^{-(78,5398)} = 8,906 \cdot 10^{-35} \text{ m}$ **to the above**

For base $e = 2,71828$ and base $b = 10$ then $e^{-(80,5905)} = 1 \cdot 10^{-35} \text{ m}$ **question.**

$$L_p = e^{i(\frac{\pi}{2} + 2k\pi) \cdot b} = e^{-i(5\frac{\pi}{2}) \cdot b} = e^{i(-5\frac{\pi}{2}) \cdot 10} = e^{-(78,5398)} = 8,906 \cdot 10^{-35} \text{ m} = \{\sqrt{3} \cdot \pi \cdot 1,616199 \cdot 10^{-35} \text{ m}\}$$

i.e. Planck's Length L_p During Diffraction, $d\bar{s}$, frequency f , doesn't change and only the velocity \bar{v} , and wavelength λ , changes, or the Wave nature of Even function $f(\Lambda)$ and of Odd $f(-\Lambda) \equiv [0, -\nabla_x \Lambda]$ creates on Planck-Length, $d\bar{s}$, Fermions and Bosons.

$$\text{Again } \mathbf{z}^{1/w} = (s + \bar{v} \nabla i)^{1/w} = |\mathbf{z}_0|^{-w} \cdot [\cos(\varphi + k\pi)/w + i \cdot \sin(\varphi + k\pi/w)] = |\mathbf{z}_0|^{-w} \cdot \mathbf{e}^{i(\varphi + k\pi)/w}$$

For $\cos(\varphi + k\pi)/w = 0$ then exists only the Imaginary part of monad, $(\bar{v} \cdot \nabla i) \neq 0$, where $\varphi = \pi/2$ and then, it is the **Diffraction Energy mechanism** for all Space Levels of quantization which are **The Energy Particles only** i.e. Energy particles where $\mathbf{z}^{1/w} = |\mathbf{z}_0|^{-w} \cdot L_v = \text{Energy Monads}$.

Extending quantization of Energy according to exponential formula $L_v = e^{-i(\frac{\pi}{2} \pm k\pi) \cdot b}$ on the decimal

base $b = 10$ then for $k = \pm 0 \rightarrow \pm \infty$, $L_v = e^{-i(\frac{\pi}{2} \pm k\pi) \cdot b} = e^{-i(\pi \pm 2k\pi) \cdot b/2} = e^{-i(\pi \pm 2k\pi) \cdot 10/2}$ so,

For base $e = 2,71828$ and base $b = 10$ then $e^{-(13,8155)} = 1 \cdot 10^{-6} \text{ m}$ which is the **Basic Cavity of Energy Balanced Tank Length**.

For base $e = 2,71828$ and $k = 0$, $L_v = e^{-i(\pm \frac{\pi}{2}) \cdot b}$ then $e^{-(15,7079)} = 1,78118 \cdot 10^{-7} \text{ m}$

For base $e = 2,71828$ and base $b = 10$ then $e^{-(16,1181)} = 1 \cdot 10^{-7} \text{ m}$

For base $e = 2,71828$ and base $b = 10$ then $e^{-(46,0517)} = 1 \cdot 10^{-20} \text{ m}$ **The energy**

For base $e = 2,71828$ and $k = 1$, $L_v = e^{i(-\frac{3\pi}{2}) \cdot b}$ then $e^{-(47,12389)} = 5,344 \cdot 10^{-21} \text{ 1/3 Balanced-Tank}$

For base $e = 2,71828$ and base $b = 10$ then $e^{-(48,3543)} = 1 \cdot 10^{-21} \text{ m Length}$

For base $e = 2,71828$ and base $b = 10$ then $e^{-(78,2879)} = 1 \cdot 10^{-34} \text{ m}$

For base $e = 2,71828$ and $k = 2$, $L_v = e^{i(-\frac{5\pi}{2}) \cdot b}$ then $e^{-(78,5398)} = 8,906 \cdot 10^{-35} \text{ m Planck's Length}$

For base $e = 2,71828$ and base $b = 10$ then $e^{-(80,5905)} = 1 \cdot 10^{-35} \text{ m}$

For base $e = 2,71828$ and base $b = 10$ then $e^{-(108,22149)} = 1 \cdot 10^{-47} \text{ m}$

For base $e = 2,71828$ and $k = 3$, $L_v = e^{i(-\frac{7\pi}{2}) \cdot b}$ then $e^{-(109,9956)} = 2,295 \cdot 10^{-48} \text{ m Under-Planck}$

For base $e = 2,71828$ and base $b = 10$ then $e^{-(110,524085)} = 1 \cdot 10^{-48} \text{ m}$

For base $e = 2,71828$ and base $b = 10$ then $e^{-(140,457691)} = 1 \cdot 10^{-61} \text{ m}$,

For base $e = 2,71828$ and $k = 4$, $L_v = e^{i(-\frac{9\pi}{2}) \cdot b}$ then $e^{-(141,372)} = 3,969 \cdot 10^{-62} \text{ m Gravity Length}$

For base $e = 2,71828$ and base $b = 10$ then $e^{-(142,760276)} = 1 \cdot 10^{-62} \text{ m}$

For base $e = 2,71828$ and base $b = 10$ then $e^{-(172,693882)} = 1 \cdot 10^{-75} \text{ m}$

For base $e = 2,71828$ and $k = 5$, $L_v = e^{i(-\frac{11\pi}{2}) \cdot b}$ then $e^{-(172,7876)} = 9,593 \cdot 10^{-76} \text{ m Under-Gravity}$

The Energy Stores of Photon

For base $e = 2,71828$ and base $b = 10$ then $e^{-(174,996467)} = 1 \cdot 10^{-76}$ m

For base $e = 2,71828$ and base $b = 10$ then $e^{-(202,627488)} = 1 \cdot 10^{-88}$ m

For base $e = 2,71828$ and $k = 6$, $L_v = e^{i \cdot (-\frac{13\pi}{2})} \cdot b$ then $e^{-(204,2040)} = 7,155 \cdot 10^{-89}$ m *1st Layer Length*

For base $e = 2,71828$ and base $b = 10$ then $e^{-(204,930073)} = 1 \cdot 10^{-89}$ m

For base $e = 2,71828$ and $k = 7$, $L_v = e^{i \cdot (-\frac{15\pi}{2})} \cdot b$ then $e^{-(235,619)} = 6,7197 \cdot 10^{-103}$ m *2nd Layer Length*

For base $e = 2,71828$ and $k = 8$, $L_v = e^{i \cdot (-\frac{17\pi}{2})} \cdot b$ then $e^{-(267,035)} = 1,2452 \cdot 10^{-117}$ m *3rd Layer Length*

For base $e = 2,71828$ and $k = 9$, $L_v = e^{i \cdot (-\frac{19\pi}{2})} \cdot b$ then $e^{-(298,451)} = 3,8438 \cdot 10^{-130}$ m *4th Layer Length*

For base $e = 2,71828$ and $k = 10$, $L_v = e^{i \cdot (-\frac{21\pi}{2})} \cdot b$ then $e^{-(329,867)} = 7,4058 \cdot 10^{-144}$ m *5th Layer Length*

For base $e = 2,71828$ and $k = 11$, $L_v = e^{i \cdot (-\frac{23\pi}{2})} \cdot b$ then $e^{-(361,283)} = 9,6783 \cdot 10^{-158}$ m *6th Layer Length*

For base $e = 2,71828$ and $k = 12$, $L_v = e^{i \cdot (-\frac{25\pi}{2})} \cdot b$ then $e^{-(392,699)} = 4,5299 \cdot 10^{-171}$ m *7th Layer Length*

i.e. on the Natural base ,e, and decimal base b = 10 , the Total Energy [$\bar{z}^{1/w} = |\bar{z}_0|^{-w} \cdot L_s$] Stored in the quantized Space $L_0 = 1,781 \cdot 10^{-7}$ m and damped , through Diffraction Energy mechanism

(1/3 Spin Tank) is quantized , as 18 Particles (the Fermions and Bosons) in the Planck's length $L_p = 8,906 \cdot 10^{-35}$ m which create all others . On the same Sub-Spaces and on the same exponential base exist also the infinite Spaces , Anti-spaces and Sub-spaces , i.e. the infinite monads in one monad .

The rate of exponential increase , of Layers length is the Spatial rate $3.3.3 = 27$.

Conservative Planck's constant L-Planck = $1,616 \cdot 10^{-35}$ m = $\sqrt{h \cdot G / c^3}$ is consisted of the three compromising constants h,G,c, instead that of mine $L_v = e^{i \cdot (-5\pi/2)} \cdot 10 = 8,906 \cdot 10^{-35}$ m =

$\{\sqrt{3} \cdot \pi \cdot 1,616199 \cdot 10^{-35}\}$ m which is based on the two natural constants e, π . Analyzing the Binomial and Exponential nature of Spaces as monads truth is shown .

Energy which is stored as Temperature in the *Stabilizer Balance Tank cavity* $L_T = 1,781 \cdot 10^{-7}$ m and then dissipated and damped in *Planck's Tank cavity* $L_P = 8,906 \cdot 10^{-35}$ m , following the ideal Gas equation [$P = n \cdot R \cdot T / V$] of Entropy in Thermodynamics and *Stefan-Boltzmann Black Body law* as , $W_d = \sigma \cdot T^4 / (\pi \cdot L^2 / 4)$.

Again , $z^{1/w} = (s + \bar{v} \nabla i)^{1/w} = |z_0|^{-w} \cdot [\cos(\varphi + k\pi)/w + i \cdot \sin(\varphi + k\pi)/w] = |z_0|^{-w} \cdot e^{i \cdot (\varphi + k\pi)/w}$

For $\sin(\varphi + k\pi)/w = 0$ then exists only the Real part of monad , $s, \neq 0$, where $\varphi = -\pi \pm k \cdot \pi$, and then ,

$z^{1/w} = |z_0|^{-w} \cdot e^{\frac{i(\varphi + k\pi)}{w}} = i \cdot (-\pi \pm k\pi) \cdot 10$, and it is the *Diffraction Massive mechanism* for all Space

Levels of quantization which are particles with mass only , i.e. particles where $z^{1/w} = |z_0|^{-w} \cdot L_s =$ Massive Monads .

Extending quantization of Massive Part according to exponential formula $L_s = e^{i \cdot (-\pi \pm k\pi) \cdot b}$ on the decimal base $b = 10$ then for $k = \pm 0 \rightarrow \pm \infty$, $L_s = e^{i \cdot (-\pi \pm k\pi) \cdot b} = e^{-i \cdot \pi(1 \pm k) \cdot 10}$, so , for the clearly

massive monads ,s, only , where Space and Energy is **quantized** and measured on the three Constant and Natural numbers **e** , **π** , **i** , and for base the natural logarithm ,e, and exponent the decimal base **b=10** , then energy is stored (**dissipated as Temperature**) in the **Tank cavity** $L_T = 3,56 \cdot 10^{-14}$ m from where is then dissipated and damped through **Diffraction Massive mechanism** (**Spin Tank**) in **Planck's Tank cavity** $L_P = 8,906 \cdot 10^{-35}$ m , following the two ideal Gas equations where ,
 → **During Diffraction** ,d \bar{s} , **frequency** ,f , **doesn't change and only the velocity** , \bar{v} , **and wavelength** , λ , **changes** ← **i.e. The Wave nature of function** $f[-\nabla \lambda , 0]$ **creates on Planck-Length** ,ds , **Fermions** and exists a separate Energy Tank for this Level of particles which is only of the stored energy for quantized particles where is $\mathbf{z}^{1/w} = |\mathbf{z}_0|^{-w} \cdot L_s = \text{Monads}$,

Extending quantization of Space and Energy according to exponential formula $L_s = e^{i \cdot (-\pi \pm k\pi) \cdot b}$ on the decimal base $b = 10$ then for $k = \pm 0 \rightarrow \pm \infty$, $L_s = e^{i \cdot (-\pi \pm k\pi) \cdot b} = e^{i \cdot (-\pi \pm k\pi) \cdot 10}$, then

- For base $e = 2,71828$ and base $b = 10$ then , $e^{-(29,933606)} = 1 \cdot 10^{-13}$ m , **Particles length**
- For base $e = 2,71828$ and $k = 0$, $L_s = e^{i \cdot (-\pi) \cdot b}$ then , $e^{-(31,41593)} = 3,56237 \cdot 10^{-14}$ **In-Planck's**
- For base $e = 2,71828$ and base $b = 10$ then $e^{-(32,236191)} = 1 \cdot 10^{-14}$ m **mini. Acceleration**
- For base $e = 2,71828$ and base $b = 10$ then $e^{-(62,103404)} = 1 \cdot 10^{-27}$ m
- For base $e = 2,71828$ and $k = 1$ $L_s = e^{i \cdot (-2\pi) \cdot b}$ then , $e^{-(62,83185)} = 9,31289 \cdot 10^{-28}$ m **1/2 Spin Tank**
- For base $e = 2,71828$ and base $b = 10$ then $e^{-(64,405989)} = 1 \cdot 10^{-28}$ m
- For base $e = 2,71828$ and base $b = 10$ then $e^{-(156,575786)} = 1 \cdot 10^{-40}$ m
- For base $e = 2,71828$ and $k = 2$ $L_s = e^{i \cdot (-3\pi) \cdot b}$ then , $e^{-(94,24778)} = 7,81183 \cdot 10^{-41}$ m **1/3 Spin Tank**
- For base $e = 2,71828$ and base $b = 10$ then $e^{-(156,878371)} = 1 \cdot 10^{-41}$ m
- For base $e = 2,71828$ and base $b = 10$ then $e^{-(218,745584)} = 1 \cdot 10^{-54}$ m
- For base $e = 2,71828$ and $k = 3$ $L_s = e^{i \cdot (-4\pi) \cdot b}$ then , $e^{-(125,6637)} = 4,93666 \cdot 10^{-55}$ m **1st Layer Length**
- For base $e = 2,71828$ and base $b = 10$ then $e^{-(221,048169)} = 1 \cdot 10^{-55}$ m
- For base $e = 2,71828$ and $k = 4$ $L_s = e^{i \cdot (-5\pi) \cdot b}$ then , $e^{-(157,07963)} = 7,8118 \cdot 10^{-69}$ m **2nd Layer Length**
- For base $e = 2,71828$ and $k = 5$ $L_s = e^{i \cdot (-6\pi) \cdot b}$ then , $e^{-(188,49555)} = 1,3742 \cdot 10^{-82}$ m **3rd Layer Length**
- For base $e = 2,71828$ and $k = 6$ $L_s = e^{i \cdot (-7\pi) \cdot b}$ then , $e^{-(219,91148)} = 4,9365 \cdot 10^{-96}$ m **4th Layer Length**
- For base $e = 2,71828$ and $k = 4$ $L_s = e^{i \cdot (-8\pi) \cdot b}$ then , $e^{-(251,32740)} = 8,4989 \cdot 10^{-110}$ m **5th Layer Length**
- For base $e = 2,71828$ and $k = 5$ $L_s = e^{i \cdot (-9\pi) \cdot b}$ then , $e^{-(282,74333)} = 2,0613 \cdot 10^{-123}$ m **6th Layer Length**
- For base $e = 2,71828$ and $k = 4$ $L_s = e^{i \cdot (-10\pi) \cdot b}$ then , $e^{-(314,15926)} = 5,6236 \cdot 10^{-137}$ m **7th Layer Length**
- For base $e = 2,71828$ and $k = 5$ $L_s = e^{i \cdot (-11\pi) \cdot b}$ then , $e^{-(345,57518)} = 9,1860 \cdot 10^{-151}$ m **8th Layer Length**

i.e. on the Natural base ,e, and decimal base $b = 10$, the Total Energy $[\bar{z}^{1/w} = |\bar{z}_0|^{-w} \cdot L_s]$ **Stored in the quantized Space** $L_o = 3,56 \cdot 10^{-14}$ m **is then passing through the Regulating Valves** , **[massive – Energy , the $3,56 \cdot 10^{-14}$ and $9,31 \cdot 10^{-28}$ m] and is quantized as 18 Particles (the Fermions and Bosons) in the Planck's length $L_P = 8,906 \cdot 10^{-35}$ m. which create all others .**

On the same Sub-Spaces and on the same exponential base exist also the infinite Spaces Anti-spaces and Sub-spaces , i.e. the infinite monads in one monad .

Remarks :

By definition $[i]^2 = -1 \cdot m = \text{Energy}$, $m = \text{a constant}$, therefore $i = \sqrt{-m \cdot 1}$, and $(-m \cdot 1)^2 = -1 \cdot m$ i.e.

$[\text{Energy}]^2 = -[\text{Space}] = \text{Anti-space}$, and since also exists $\Lambda \times \Lambda = -(-m \cdot 1)^2 = \pm \Lambda \cdot \nabla i$, the basic equation of quaternion becomes $[-(\Lambda \times \Lambda)/m \pm \Lambda \times \nabla i] = [\lambda , \pm \Lambda \times \nabla i]$, i.e.

wavelength $\lambda = -(\Lambda \times \Lambda)/m$ where $m = \text{a constant}$ depending on reactions to present or other conditions.

The Energy Stores of Photon

Applying this in energy cavities then $e^{-i \cdot [(\frac{\pi}{2}) \cdot b]^2} = e^{-i \cdot [(\frac{2\pi}{2}) \cdot b]} = e^{-i \cdot (\pi) \cdot b} \rightarrow$ i.e.

Massive mechanism Diffraction and *Energy mechanism Diffraction* , are Interchangeable , or

$e^{-i \cdot [1,78 \cdot 10^{-7}]^2} = e^{-i \cdot [3,56 \cdot 10^{-14}]}$ and for Relativity massive Energy $(\Lambda \times \Lambda) = (-m \cdot i) \times (-m \cdot i) = m(i)^2 = -m(\bar{v})^2 = -m \cdot \bar{v}^2$, where imaginary part , $i = \bar{v} \rightarrow$ the velocity vector .

Since [1eV = 10^{-19} J , 1GeV = $10^9 \cdot 10^{-19} = 10^{-10}$ J , 1TeV = 10^{-7} J] then ,

Energy 100 GeV $\rightarrow E = m \cdot r \cdot v = 100 \text{ GeV} \cdot 10^{-10} \text{ J} \cdot (8,906 \cdot 10^{-35}) \cdot m \cdot 2,02 \cdot 10^{51} \text{ m/s} = 1,799 \cdot 10^9 \text{ J}$, a quantity near that of Planck's energy .

E : THE ENERGY IN CAVES .

1.. *Energy in Atoms* .

The Electronic Structure Of Atoms And Molecules , And Energy- Quantization :

1..As prior referred [54-55] for the First-Rotating-Monad , the common point executes circular motion on the Positive breakage of radius , r . Wheel-Loop is a closed Stereo-Slate-Tube for Positive and Negative breakages , and Free to undergo transverse vibrations , then this gives Odd-numbered harmonics only , and simultaneously as Open - Tube , gives both Odd-and-Even numbered harmonics .

2..Energy of loop or , Energy-Level , become from Rotational-Energy only , therefore issue Mechanical equations of motion , Independently of magnitude ,

3..Energy of loop or , Energy-Level , become from Rotational energy $E_R = r \cdot m \cdot v \dots(1)$ where r = The radius of rotation , m = The mass of inner-motion of particle (it is the reaction to inner change of velocity vector) ,

v = The tangential velocity to inner motion ,

w = The angular velocity.

f = The frequency of motion ,

Velocity $v = w r$, $w = 2\pi/T = 2\pi f$ and (1) becomes $E_R = (v/w) \cdot (mv) = v^2 m/w = mv^2/2\pi f = mv^2 [T/2\pi] = v^2 [mT/2\pi] = v^2 [h/2\pi] \rightarrow$ because $mT = m/f =$ The stored energy in loop for the fundamental frequency $f_0 = 1$, or $T=1$ and becomes from the relation $\lambda = 2L$ of the Stationary Waves as is $\rightarrow f_0 = v \cdot \lambda = v \cdot 2L$ i.e.

The stored energy in the loop is $\rightarrow E_1 = v^2 [\frac{h}{2\pi}]$ depending on velocity , v , and Planck's constant h .

Atoms are compound elements , while atoms of many types combine and make molecules building matter. It was proofed that in Primary particles , **Energy in n = 1 loop** $\rightarrow E_1 = [\frac{4\pi r^2}{3}] \cdot f_1$

As prior referred the Planck length L_p , i.e. *The minimum distance* \equiv *The Granular Space* , can be defined from the fundamental Physical constants , Speed of light , Planck constant , and the Gravitational constant as ,

$$L_p = \sqrt{\frac{hG}{2\pi c^3}} = 1,616229 \cdot 10^{-35} \text{ m} = \text{which agrees with one of the Energy - caves } L_p = e^{i \cdot (\frac{\pi}{2} + 2k\pi) \cdot b} =$$

$$L_p = e^{i \cdot (\frac{\pi}{2} + 2k\pi) \cdot b} = e^{-i \cdot (\frac{5\pi}{2}) \cdot b} = e^{i \cdot (-\frac{5\pi}{2}) \cdot 10} = e^{-(78,5398)} = 8,906 \cdot 10^{-35} \text{ m} = \{ \sqrt{3} \cdot \pi \cdot 1,616199 \cdot 10^{-35} \text{ m} \} .$$

Planck length is one of the too many , *Cave - lengths* , that can be formed in our Energy nature in all levels as in [54-55].

[As $1\text{nm} = 10^{-9} \text{ m}$, $1\text{A}^\circ = 10^{-10} \text{ m}$ and $h/2\pi = 1,616 \cdot 10^{-35} \text{ eVs}$, Velocity light is $2,9979 \cdot 10^8 \text{ m}$]

For a single photon of Red-light with $\lambda = 700 \text{ nm} = 700 \cdot 10^{-9} \text{ m}$, then fundamental frequency f_0 is , $f_0 = v/\lambda = c / \lambda = 2,9979 \cdot 10^8 \text{ m} / 7 \cdot 10^{-7} \text{ m} = 4,283 \cdot 10^{14}$, and the Energy of the first loop (Total) is

$$E_1 = v^2 [h / 2\pi] = (2,9979)^2 \cdot 10^{16} \cdot [1,616 \cdot 10^{-35}] = 14,524 \text{ eV.s} \dots\dots\dots(1)$$

The How many Negative breakages , **Units = Positions** , can be filled , is dependent on the Possible Repetitive Permutations of **Moulds= Orbitals** = R_C , Positive \oplus breakages ,and Units which are 2 Units and is the maximum number in a Point ,i.e. The Possible Repetitive Permutations for Moulds = Orbitals and Units which are **2.Mould^{Units} = 2.M²** , for every Mould = Space = Number of Non - coinciding Points , and the available Extrema Positions Units , for $M = N = 4$, the Total Positions in Mould is $\rightarrow 2.4^2 = 32$ Position - Units which are the Electrons in each orbital . All these happen because in Fig.6 **Atom - Orbitals , are the Equilibrium Negative Breakage Energy Stores , in Atom - Model .**

For Neutrons Units is 2N and for N-Mould , and for $N = 4$ is $2.4 = 8$ Position-Units.

Energy of the first Slice-Wheel-Rim or Orbital is distributed to orbit Electron , while energy of the second Slice -Wheel-Rim to the couple of permitted Electrons (2e) of the orbital is as,

$$E_1 = v^2 [h/2\pi] / R_1^2 = 1^2 = 1$$

$$E_2 = v^2 [h/2\pi] / R_2^2 = 2^2 = 4 , \text{ and for the } , c , \text{ Space Number ,}$$

$$E_C = v^2 [h/2\pi] / R_C^2 = R_C \cdot R_C$$

Because any Next-Atom Energy , is equal to Prior + the distributed $[\frac{E_1}{R_C^2} \cdot \frac{1}{2.R_C^2}]$ then in , c , cave

Energy in ,c, cave orbital is $E_c = v^2 [\frac{h}{2\pi}] / R_C^2$ where $R_C =$ Number of Spaces .

Energy of **Hydrogen W-Rim..1** $E_1 = \frac{E_1}{1^2} = 14,524 \text{ eV.s}$

of **Helium W-Rim..2** $E_2 = E_1 + [\frac{E_1}{1} \cdot \frac{1}{1.2^2}] = E_1 + \frac{E_1}{4}$

of **Lithium W-Rim..3** $E_3 = E_1 + \frac{E_1}{4} + [\frac{E_1}{2^2} \cdot \frac{1}{2.2^2}] = E_1 + [\frac{E_1}{4}] \cdot \frac{1}{8}$ and so on .

For c W-Rim $E_c = E_{c-1} + [\frac{E_1}{R_C^2} \cdot \frac{1}{2.R_C^2}]$ where , $W-R_C = 1,2, \dots c$, Number of W-Rim .

Following above logic all Particles or Atoms are formulated in this Geometrical formula of Moulds , [Space – Anti space - Energy] $\equiv [\oplus \leftrightarrow \ominus] - [\bar{v} \cdot \nabla i]$,the Breakage Principle ,without any Assumptions , or Axioms , or Exclusion Principles , or any other Starting Points . [54 -55]

Using Energy in loop 1 $\rightarrow E_1 = [\frac{4\pi r^2}{3}] f_1 = v^2 [\frac{h}{2\pi}] \leftarrow$ then $8\pi^2 \cdot r^2 \cdot f_1 = 3v^2 \cdot h$, and $r^2 = \frac{3v^2 h}{8\pi^2 f_1}$, where

for Planck Length $r^2 = \frac{3.3^2 \cdot 6,626 \cdot 10^{-34} \cdot 10^{16}}{8 \cdot \pi^2 \cdot 4,283 \cdot 10^{14}} = 2,2658 \cdot 10^{-32}$, the corresponding cave of Photon is ,

$$r = 1,505 \cdot 10^{-64} \text{ m} \rightarrow \text{a cave beyond , in , Gravity length} \rightarrow 3,969 \cdot 10^{-62} - 2,295 \cdot 10^{-48} \text{ m}$$

4.. Atoms Mould :

A - It is probably fake than true , that Matter and Antimatter annihilate at rest ,instead of that when Anti-space comes in contact with its regular Space counterpart , they mutually destroy each other **decay** , and all of their Energy is converted , **transformed** , to the **Three Breakages** $\rightarrow s^2 , -|\bar{v}|^2 , [2\bar{W}] \cdot |s| \cdot |r| \cdot \nabla i \leftarrow$

and for $\bar{v} = s \equiv$ the cave

$[s^2] \rightarrow$ is the Real part , **Matter** , of the new monad , and is **a Positive Scalar magnitude** .

$- [s^2] \rightarrow$ is the always Negative part , **Anti-matter** , which is always **a Negative Scalar magnitude** .

$2 s^2 \cdot \nabla i \rightarrow$ is the double Angular-Velocity Term , **The Energy Term** , which is **a Vector magnitude** .

All above issue for Quaternion monads which follow the **Breakage Principle - Rule** . [66]

B – Stationary Fragments $\rightarrow [-s^2, +s^2] = [MFMF] =$ **The Chaos** , is the base for all motions . Because Pure energy happens at $s = 0$ where then $2[\bar{s}]^2 \cdot \nabla i = 0$, i.e. $\nabla i = 0$ or $[\nabla i]^2 = 0$, meaning that **Energy as Matter**, looks like , is moving perpendicularly to **Energy as Anti-matter** ,without annihilate each other. Photon is a Particle in all Levels , of Energy - magnitudes , and thus traversing gaseous - media of any

Temperature experiencing redshift without losing Energy ,because Energy is stored in Photons lobes . Star-light passing near the Sun is bending because of its refraction in the dense-Sun , and of Newton`s gravitation ,while Red-shift happens as low f and-Blue-shift , as high f being as Particle and Wave .

C - Energy is the motion of the $[\ominus \leftrightarrow \oplus] \equiv [\text{Space} \leftrightarrow \text{Anti-space}]$ charge , as is the Electrostatic force , in the N loops which *as Work can be stored in the ,n, Energy loops of the Stationary Wave of cave , r* . The N loops are the **Energy - Stores in M-P , and *mass the Reaction* to the **Up - Down oscillatory motion in Loop** of each wave Segment at frequency , f_n , which describe each *mode* and characterized by a different λ and f . This happens because of charges alternation $[+ , - \text{ to } - , +]$, i.e. (AC) which exists on Antinodes amplitude of the *Up - Down* oscillation .**

All monads can immediately be other monads with different frequency ,f, by following the *Breakage rule* $\rightarrow s^2 - |\bar{s}|^2 + 2|s|^2 \cdot \nabla i \leftarrow$ i.e. **matter (+) , antimatter (-) , energy (+ -)** or , *Material Point A - $K_R \equiv$ monad \equiv Dipole $\equiv [\oplus \ominus] = \emptyset = K_r A K_{R=r}$ where $\rightarrow \{ K_R \equiv [\oplus] \} \leftrightarrow \{ K_r \equiv [\ominus] \} \rightarrow \equiv 0$.*

D -The Breakage Principle is the way of Energy conservation , which Energy never annihilates and which is always reverted into \rightarrow The two Opposites and an Neutral Part \leftarrow or Matter , Antimatter and the Energy part , and always to its constituents , either all or separate.

When a Particle meets its Antiparticle , the two annihilate each other to form two Photos , *gamma rays consist the two Opposites and the Subatomic particles as Ionizing radiation , the Neutral part* , due to conservation of Momentum ,with sum total energy equivalent to the total mass-energy of both particles. Energy ,*motion* , in Photons is conserved in their , *Neutral Energy lobes*. Photon following the Breakage -Principle ,may produce another pair of particles and this because is a composition of other Sub-monads which again annihilate each other and produce another energy particle and so on ,until *Primary Particles* which are the Material points of the caves .

Since Atom is a New monad , so follows the *Breakage - rule* $\rightarrow [+] , [-] , [+ , -] \leftarrow$ and because Atom is a composition of other monads then is , $L_T = 1,887 \cdot 10^{-7} \text{ m}$

Nucleus $\rightarrow [+] \equiv [+ \text{ cave}]$, *the minimum acceleration Planck`s cave* $r < 3,56237 \cdot 10^{-14} \text{ m}$

Electron $\rightarrow [-] \equiv [- \text{ cave}]$, *the minimum acceleration Planck`s cave* $r < 3,56237 \cdot 10^{-14} \text{ m}$

Orbitals $\rightarrow [+ , -] \equiv [\pm \text{ cave} \equiv \text{Material Point}]$ *In mini-acceleration cave* $r < 3,56237 \cdot 10^{-14} \text{ m}$

From Math , $[1\text{nm} = 10^{-9} \text{ m} , 1\text{\AA} = 10^5 \text{ fm} , 1\text{fm} = 10^{-15} \text{ m} , 1\text{\AA} = 10^{-10} \text{ m} , 1\text{amu} = 1,66 \cdot 10^{-10} \text{ Kg}]$

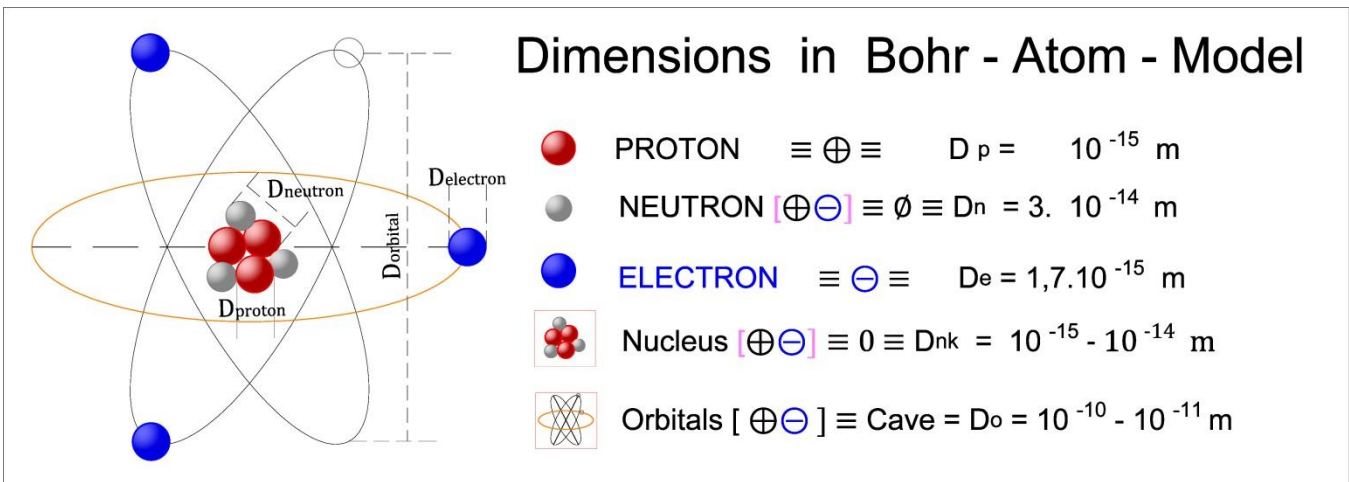


Fig-7. *Atom* , Proton , Electron , Neutron , *Photons*, are Compound and Stable Wave-Energy-monads.

Proton is a Stable and Stationary Particle , *the Matter* , and consists the $\rightarrow [\oplus]$ Positive Breakage of the three constituents of Atom monad ,

Electron is a Stable and Moving Particle , *the Anti-Matter* , and consists the $\rightarrow [\ominus]$ Negative Breakage of the three constituents of Atom monad ,

Neutron is a Stable and Stationary Granular lattice Energy , and consists the $\rightarrow [\oplus \leftrightarrow \ominus]$ Neutral Breakage [\emptyset] and are Orbitals and Nucleus structure of the three constituents ,

Proton is composed of three Fermions , Two up-quark = $(+\frac{1}{3}e) + (+\frac{1}{3}e) = (+\frac{2}{3}e)$ and One down-quark = $(-\frac{1}{3}e)$. Constituents $(+\frac{1}{3}e)$, $(-\frac{1}{3}e)$, consist *Matter* and *Anti-matter* of Proton-monad while the remaining $(+\frac{1}{3}e)$ consists the , third *Strong-Energy-Breakage part* , showing that Decay of the Proton does not violate the conservation of baryon number.

Electron is the Negatively charged particle that makes Electricity by its flowing force and which consists the Anti-matter . Because electron is a *Primary-Particle* , it is composed of the N energy tanks , the N loops in its Main-store $\lambda = r = h/p \equiv [f_1, f_2, f_n \equiv n]$ lobes following the *Stationary-Wave-Nodes-Principle*.

Electron Decay from n_2 to n_1 orbital , causes an electron to jump to a lower energy level orbital , by releasing the extra energy in the form of light photon , *meaning that electron loses energy*. Instead of this , because electron is a *Stationary-Energy-Store* , Energy is complemented from its Main-store .

Neutron is composed of three Fermions , Two down-quark = $(-\frac{1}{3}e) + (-\frac{1}{3}e) = (-\frac{2}{3}e)$ and One up-quark = $(+\frac{2}{3}e)$. Constituents $(+\frac{2}{3}e)$, $(-\frac{2}{3}e)$, consist *Matter* and *Anti-matter* of Neutron-monad consisting the (+) particle rotating around (-) particle of the *Neutron-Primary-Material- point* .

Photons are the Neutrally charged massless particle that make up light and are the force carriers for the Electromagnetic force which consists the Matter . Electromagnetic force is composed of the Electric Field denoting , *the matter = Particle* and Magnetic field denoting *the Anti-matter = Anti-particle* . Force carrier denotes the Energy - tanks of Photon which are , the N energy - loops in its main store $\lambda = r = h.c / E_{ph}$ of Photon . **Photon Decay** causes a Photon to jump to a lower energy level , releasing the extra energy in the form of light photon from its Main-store $\lambda = h/p$. This issues because Photon is a , *Moving-Energy-Store* , in-where energy is conserved as frequency from formula $E = h.f = \frac{hc}{\lambda}$, or as increasing wavelength $\lambda = r$, i.e. *corresponds to an increase in light's wavelength* λ , where , $\lambda \equiv [f_1, f_2, \dots, f_n \equiv n]$ loops \equiv the lobes which follow the *Stationary-Wave-Nodes Principle*] .

Photon follows Cycloidal motion of Space Anti-space in λ , so exists centrifugal acceleration and the Total-energy $2E = w.B$ as Stationary Wave *Inward* the N lobes is thus producing the Skin-effect as , n , frequencies f_n , and moving *Outward* as Electromagnetic Wave with light velocity .

SUMMARY :

1.. Material points are produced from the Unclashed Matter \oplus , and Anti-matter \ominus , which is the Stationary [MFMF] $\equiv [-|s|^2 , +|s|^2] \equiv$ Chaos , where the two opposite spaces , *come in contact* , according to the *Glue-Bond - Principle* and Not by *Forced - collision* .

2.. The *Circular motion* of \oplus space , to \ominus anti-space creates in Material point , the Angular momentum vector \vec{B} and angular velocity vector \vec{w} , related to the Total Work W , according to formula $2W = \vec{B} \vec{w}$, and was proved that vector \vec{B} is the Spin of particles [63] . Work W is the produced energy E in material point and it is the eternal motion of $[\oplus \leftrightarrow \ominus]$ charge , which is trapped in the N lobes of the material point , *as the Up-Down oscillatory motion in loops* , of each Wave-Segment , at frequencies , f_n , which describe each mode characterized by a different λ and f . Inward wavelength λ , Energy is stored as a stationary Energy-cave while Outward as the Spin of particles .

3.. The *Cycloidal rotation* of \oplus space , to \ominus Anti-space creates in Material point as in circular motion *Spin = Vector* $\vec{B} \equiv \frac{2W}{\vec{w}}$, and additionally because of Centrifugal acceleration , is created the *Skin-effect* , which is the tendency of the alternating Electric current (AC) to become distributed within the material

point at the common point of bonding , and this because of *Principal-Stress* σ , [59] . At the very high frequencies the thin layer of material point ($\lambda=0 \rightarrow 3,969.10^{-62}$ m) carries most of the Electromagnetic force as this is from Maxwell`s equations in complex form $\nabla \times E = -j.w.B$ and $\nabla \times H = J$, and since , $E = J/\sigma$ and $H = B/\mu$, then $\nabla \times J = -jw\sigma B$, $\nabla \times B = \mu J$ which give the Skin-depth $\rho = \sqrt{\frac{2}{w\mu\sigma}}$ Spin (m) So , *because of the Skin effect* , Kinetic - Energy moves *Outward the cave* , as an Electromagnetic Wave and this because is consisted of the \rightarrow Space \equiv Electric Field , Anti-space \equiv Magnetic Field which are perpendicular each other so that no Work is produced , and of the Energy part which is the Energy tank , the cave λ , with zero conductivity \leftarrow and all Breakages travelling with light velocity .

With this way are created the Photons and the other Energy Particles as Gauge Bosons and the exceeding the light velocity particles of [MFMF] field . In case of $r < L_p = 1,616199.10^{-35}$ m , Electromagnetic wave occupies the velocity of $C_c = 3.10^{10}$ m/s in order to exist the conservation Total Energy Principle .

4.. For the circular rotation in wavelength λ of the material points exists the stationary wave in loops with Spin \bar{B} which is getting Out the wavelength and is *locally-equilibrium* by this eternal - rotation . With this way are produced all Positive (+) and Negative (-) particles according to the Spin direction , as Flavours and Leptons are . For Primary particles under Planck`s length , the local-equilibrium of \bar{B} vector creates the ocean of [MFMF] \equiv Chaos in where exists the Gravity force .

5.. In case of the Compound particles (*the Not Primary particles*) as the Bohr model of atoms , Breakage principle is still existing , particularly on the three Constituents and on all Total formation as ,
 Nucleus $\equiv \oplus \equiv$ The Space \equiv The matter \rightarrow and the equal in charge counterpart
 Electron $\equiv \ominus \equiv$ The Anti-Space \equiv The Anti-matter \rightarrow and the Energy loop as ,
 Orbitals $\equiv [\oplus \leftrightarrow \ominus] \equiv [\emptyset]$ as the Energy-tanks of atom .

Epilogues .

The origin of Space [S] becomes , through the Principle of Virtual Displacements $W = \int_A^B P. ds = 0$, from Primary Point **A** , which is **the Space** , to point **B** which is the **Anti - space** as the Inner distance of Space and Anti-Space in all Layers becoming as shown from STPL Mechanism .

The origin of Energy becomes , through the same Principle because are co-related and is the Work executed by the displacement , ds , is conserved between points A and B and which never vanishes . This means that Universe is Energy-Space and nothing else ,which follows the Glue-Bond – Principle in all Positions and Layers starting from **The First Eternal < Self – Moving – Energy - Dipole >** \equiv **The Quantum** , of this cosmos and vanishes in every Energy Space level .

The Torsional oscillation Cycloidal motion in Caves (cleft , slit) w , is transformed as inner Wave - frequencies which in turn , to monads and moving Particles transforming the Inward - Spin to the Outward - Spin and motion . All above are produced in and from STPL .

Energy produced by Reference System $\{D_A - P_A\} \equiv [R]$ (x', y', z', t') moves with velocity \bar{v} , parallel , to $x-x'$, axis with respect to the fixed and Absolute System $\{D_A - O\} \equiv [S](x,y,z, t)$ and is conserved . **Energy of the whole universe** is defined as a whole , all at once , and not the Energy of different pieces . It was referred that Energy in Gravitational – Field is Torsional and Negative and always attractive . [27]

In General-Relativity is referred that Space time is giving energy to matter or absorbed it from matter , and thus the Total energy is not conserved . Here are not clarified the three Basic Quantities , **Energy** , **Matter and Time** . It was proved that the Basic Quantity is **only the Energy** , while Matter is the Space , the Energy loops , in where Energy is stored , and Time is the meter of changes in Energy.

The Argument < Energy is not conserved but it changes because Spacetime does > is the greatest - confusion for these magnitudes .

In [31-36] and [39] was clarified that \rightarrow

1). Because of Zero acceleration of rotational velocity \bar{w} in a cave , velocity $\bar{v} = w.r$ is also constant , so thus GR failed *to explain the WHY speed of light is constant* , considering constancy of light as an axiom from which derived the rest of its theory .

2). For the reality of discrete monads , GR failed *to explain the WHY → Wave nature , is the Intrinsic Electromagnetic Wave of Particles* (Maxwell's Displacement current) and speed of light is constant in a Stress-Strain System with (where Red-shift happens as low f and-Blue-shift , as high f) Photon to be as Particle and Wave also of the cycloidal motion as above , but considering constancy of light as an axiom deriving theory .

Here is referred that , Since the mass is equal to $m = \frac{2}{c^2} (wr)^3 = \frac{h.w}{2\pi.c^2}$, analogous to Energy w , → then *mass is a factor measuring energy* ,

3). GR , by Appealing , *accepting* space-time a Priori , is thus *accepting the two elements , Space and Time , as the fundamental elements of universe* without any proof for it , and so anybody can say that this logic *Stay on air* . It was forgotten that ,

The Proof becomes from Geometrical - logic and discovery by the uncontested knowledge .

It has been proofed [22-26] that any space AB is composed of points A , B which are nothing and equilibrium by the opposite forces $P_{\bar{A}} = - P_{\bar{B}}$ following *Principle of Virtual Displacement* .

4). GR , by Presenting Time as element of universe *could not perceive that , Time (t) is the conversion factor between the conventional units (second) and length units (meter) , and by considering the moving monads (particles etc. in space) at the speed of light pass also through Time , this is an widely agreeable illusion* . It was proved that Time is a meter , *A simple number* , measuring the alterations of Space concerning velocity and direction , and not any essence .

5). GR by Presenting Space-Time universe *Becoming from Big Bang* is accepting Infinite priors. Euler-Savary equation of couple-curves is related to the Tangential and angular velocity from (Space , Path , Anti-space , Evolute) and is , *The Rolling – Glue - Bond of Space , Anti-space* , and which happens on the instaneous center of curvature by STPL line . [58]

6). The Energy - Space Genesis Mechanism :

Everything in this cosmos , is Done or Becomes , from a Mould where ,

In Geometry Mould is the Monad , the discrete continuity AB from points ,

In Mechanics-Physics Mould is the Recent Acquisition of Material - Geometry where ,

Material-point = The discrete continuity $|\oplus + \ominus| = \text{The Quantum} = \text{Energy distance}$,

In Plane Mould is number π , becoming from the Squaring of the circle as an extrema case ,

In the Space , volume, Mould is the number $^3\sqrt{2}$ becoming from the Duplication of the Cube

[STPL] Geometrical Mechanism In , is itself the Mould which produces and composite all opposite Spaces and Anti-spaces Points , to Rest-Material-points which are the three Breakages

$\{[s^2 = \pm (\bar{w}.r)^2 , [\nabla i] = 2(wr)^2\}$ of [MFMF] Gravity , under thrust $\bar{v} = \bar{c}$ } ,

where become **Fermions** → $[\pm \bar{v}.s^2]$ and **Bosons** → $[\bar{v}.\nabla i = [\bar{v}.2(\bar{w}.r)^2] = [\bar{v}.2s^2]$] .

Big Bang and GR was the temporary solution to the weakness of what men-kind had to answer .

Nature cannot be described through infinite concepts , as this can happen in Algebra and values , because are devoid of any meaning in our Objective - Reality , or the Physical World , or the Nature , or the Cosmos . Solutions of geometric classification problems with moduli Spaces , and Algebraic geometry by giving a universal space of parameters for the problems , must follow the classical and *dialectic logic of Geometry which exists in Objective reality*.

And which is this logic ? This way of thinking is nothing else than the Dialectic way of thinking And which is able to solve the Geometrical problems and that of Mechanics .

Material Geometry is the Science and the Quantization-Quality of this Cosmos which joints the ,infinite

dimensionless and the meaningless Points , *which have only Position* , with those of Nature which are *Qualitative the, Positive - Negative - Zero Points and which have , Positions , infinite Directions and Magnitudes with infinite meanings* , which through the Physical laws are the language of them in itself. One of the most important concept in geometry is , **distance** , which is the Quanta in geometry, while in Material-Geometry the composition of opposite , **the Material-point** , which is the Quanta in Chemistry and Physics . A wide analysis in Book [58] . The Work , *as Energy* , is the Essence of this deep connection of Material-Points , *The Space* , and through the Conservation-laws is making the Material -Geometry from STPL mechanism. Extension of the Material - Geometry to the chemical-sector gives the possibility for new materials in a drained way of thinking . In summary, my personal confidence is that nature is produced from Euclidean Geometry moulds , **as Space only** from Energy opposites , **by following the 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 [32] for the nature of the parallel lines, a unique Postulate directly connected to the physical world . [STPL] line (doubled cylinder in spatial CS) is the creation Mould for Particles, *Quanta*, which are created between all Space-Levels and which Spaces are directly connected . [58] Particles and Forces consist the monads *i.e.*

The Vibrations caused by the varying lever arms , *the varying lengths between Cycloid and Anti-cycloid of inner structures of monads* , and which cause the *Inner Electromagnetic waves and Spin* of Energy caves create motion . **In case of Cycloidal rotational motion** , which is *Isochronous* , *the acceleration* $\ddot{x} = -w^2 \dot{x}$ where $w = 2\pi/T$, *produces the Skin-effect from the Up - Down oscillatory motion, and thus developing the Amplification factor causing a powerful motion In-Loop , and an Electromagnetic Wave Outer Loop travelling with light velocity , c . Above property belongs to Photons .*

Vibrations are caused from the first Material point becoming from the eternal rolling of the $|\oplus|$ Space on the \ominus Space producing the physical angular velocity of monads .

Inner Spin and EM wave is transformed to the Outer Electromagnetic Wave of Particles *due to Skin - effect* as this is in Photon .

Their Inner Electric and Magnetic forces are related to gravity`s forces , and thus unify all physics .

Considering the Material - point as a closed system , and according to the Second law of Thermodynamics tends to equilibrium State, *on the contrary* , Spin is the available energy to do Work , *i.e.* ***In Material point the second law of Thermodynamics is Violated .***

Moreover , the articles concerning the Ancient and Special unsolved till yesterday Greek problems of E-geometry argue , and defense on all the above referred . [44 - 49]-[52]

7). The How Energy from Chaos becomes the First-Discrete-Material-Point :

Material-point was proved to be a System which has an Inner-Rotation - constrained , Due to the velocity vector , $\bar{v} = \frac{d\psi}{dt}$ and Angular velocity , \bar{w} , becoming from Stress , σ , from the two Opposite Constituents $[\oplus \leftrightarrow \ominus]$, and which is the Force applied on lever-arm , \bar{r} , in space , on where External Forces and Moments are not existing .

The inner forces of this system , are the two equilibrium → Centripetal and Centrifugal Forces due to the Eternal , $\pm \sigma$, Stresses of Opposites .

As in Algebra Zero ,0, is the **Master-key** number for all Positive and Negative numbers and this because their sum and multiplication becomes zero, *and the same* on any coordinate-system where \pm axes pass from zero , ***Exists also Apriori in Geometry the Material-Point*** in where the Rolling of the Positive \oplus , constituent on the Negative \ominus , constituent , creates the Neutral Material point which Equilibrium , and consists the **First-Discrete - Energy-monad** which occupies , **Discrete Value and Direction** , in contradiction to the point which is , nothing , *Dimensionless* and *without any Direction* .

Material-point was proved to be the *First Energy monad* because occupies a Space , a cave , in where exists an Eternal intrinsic rotation with a constant Angular-velocity and an Angular-momentum . This

Angular – momentum is identical with Spin , which is trapped in caves` s lobes as loops and which are in Phase with each other. The amplitude of Oscillation varies from Zero at Nodes to maxima at Antinodes .

8). The How and Where , Energy from Chaos Becomes Discrete – monads and Spin :

In Planck` s cave [61A–64] is proved and shown ,

The Angular-momentum Vector \bar{B} is identical to the Spin , S , and analogous to the

Magnetic moment $\bar{\mu} = \frac{4r.L}{(1+\sqrt{5})}.\sigma$ and $\bar{B} = \frac{\pi r^3 \sigma}{8} [1+\sqrt{5}]$, both depended on Glue bond σ .

The Angular -Velocity Vector \bar{w} is identical to the current-loop Torque and analogous to the charge

$$\bar{q} = \left(\frac{m.\bar{w}.\bar{\mu}}{Lg_s} \right) = [r \sigma (1+\sqrt{5})]$$

In Under-Planck cave [64] is proved and shown ,

The Angular - momentum Vector \bar{B} is identical to **Spin** $\equiv \frac{E}{w} = \frac{hm}{2\pi} = \bar{B} = [r. \sigma. (1 + \sqrt{5})]$ and analogous to cave , r , and Glue-bond $\pm \sigma$.

The Angular -Velocity Vector \bar{w} is analogous to the Principal Stress σ , as $|w| = \frac{\sigma}{2r} [1 + \sqrt{5}]$ and is causing the mass of monads , which is the meter of , *the reaction to the change of velocity vector.*

9). The Where Energy , produced through a Removal of Space , is Stored :

In article [62] was shown the Geometrical construction of all the - Regular - Polygons in a circle and , for Odd , between the two sequent Even Polygons. Any two chords at the Ends of any diameter consist *the Space* and *Anti - Space* monads which are Perpendicular each other and do not produce Work .

In case of a Removal from these two chords the *Work Produced* between them *is equal to the Central triangle Surface* , and consists the Quantization of the Work –Produced in Geometry- Monads ,

Work , Either – in , Odd - Regular - Polygons and with their Angle , OR - in , Any - Shape of Area equal to the Space triangle , and are equal also to the , In Area of the Anti - Space triangle .

It was also proved that , By Scanning Any Space-Monad KK_1 to a Space –Monad KK_2 of the circle , The Work produced is conserved in a *Space - triangle in the circle* , and in one of equal area out of the circle , which is the *Anti-Space triangle* , meaning that ,

Energy monads , which Energy - monads is the Work in caves stored as Angular momentum and Angular velocity Ellipsoids , and which were analyzed and have all been fully described .

It was shown in [58] that the free rotation is so happening because of the eternal rotation of the \oplus constituent on the \ominus constituent in the two x , z , axis of rotation .

The above relation of this Plane Work , is the Quantization in Geometry – Shapes , and becomes into the Plane – Stores of Anti-Space and , consists the Unification of Geometry – monads with those of the Physical – monads , into the Material point .

Considering the distance of rotation be , the diameter of the cave , $l = 2r$, then velocities as angular velocity , w , and velocity , v , under the condition $y(2r,0) = 0$, then leads to the Energy-equation

$$\sin \frac{2rw}{v} = 0 , \text{ or } w_n \cdot \frac{2r}{v} = \frac{4\pi r}{\lambda} = n.\pi = \frac{4\pi r f}{v} , \text{ where } n = 1,2,3 , \text{ and } \lambda = \frac{c}{f} \text{ is the wavelength and , } f , \text{ is}$$

the frequency of oscillation , *i.e.* Each , n , represents \rightarrow **a Normal mode vibration** with natural

$$\text{frequency determined by the equation } \rightarrow f_n = \frac{n.v}{4r} = \frac{n\sigma}{8r} [1+\sqrt{5}] \dots\dots\dots (n)$$

is an Energy - cave (the ∞ modes of f_n) in where , Energy \equiv Spin is stored .

Above relation (n) denotes the Energy-Storages in Material -point or Oscillations or and monads which are the Quantization of frequencies as the harmonics f_1, f_2, \dots, f_n of cave , $r = l$, depended on σ , only.

The rotating axis , $l = 2r = KK_1$ in Material – point , creates the Linear vibration of string , l , which

is $K \equiv [\ominus] \leftrightarrow K_1 \equiv [\oplus]$ and the Natural – frequency f_n , in points, K, K_1 , or the Rotational vibration of string which is $[K \equiv \ominus s^2 \cup \cup K_1 \equiv \oplus s^2]$.

In cave of radius, r , the correlation of \rightarrow **Natural frequency f_n** , becoming from the Linear vibration of string, and \rightarrow **Spin equal to the Angular - momentum Vector \bar{B}** , becoming from the Rotational vibration of string, **Spin $\equiv \frac{E}{w} = \bar{B} = [r \cdot \sigma \cdot (1 + \sqrt{5})]$** and **Natural-Frequency $f_n = \frac{n \cdot v}{4r} = \frac{n\sigma}{8r} [1 + \sqrt{5}]$** , becomes the Spin as,

Spin $\equiv \bar{B} = [r \cdot \sigma \cdot (1 + \sqrt{5})] = (\frac{8r^2}{n}) \cdot f_n$ and, **$\frac{\bar{B}}{f_n} = (\frac{8r^2}{n\sigma}) = \text{Constant for each cave}$** , and **Frequency $\equiv f_n = (\frac{n\sigma}{8r^2}) \cdot \bar{B} \rightarrow$** i.e. Energy - caves are Stationary Wave-Fringes .

In Material point, and because of the **Eternal rotation of the $[\oplus]$ constituent around $[\ominus]$ constituent**, the **Stretched - String Energy \bar{B} is not transmitted, but trapped in the, N loops, where loops are all in Phase with each other, and the amplitude of oscillation varies from zero, at the N nodes, to maxima at the antinodes**. By considering rotation as a grating having N lines per, r , then maximum values of, n , is $n < \frac{1}{N\lambda}$, i.e. the biggest whole number less than $\frac{1}{N\lambda}$ which is always integer. This is the Why Spin is,

$$\frac{l}{2}, \frac{l}{3}, \frac{l}{4}, \frac{l}{5}, \dots, \frac{l}{N}, \quad \text{i.e.}$$

One, Half, Third ... $\frac{1}{N}$ - Lengths $\rightarrow [\frac{l}{2}, \frac{l}{2}], [\frac{l}{3}, \frac{l}{3}, \frac{l}{3}], \dots, [\frac{l}{N}, \frac{l}{N}]$, with One, Two, Three ..., N- Wave-nodes.

In article was proved that, **in Material Point**, the Eternal-Rotation of (+) Opposite around (-) Opposite, due to Centrifugal and Centripetal Glue-Bond Principal-stresses, $\pm \sigma$, **creates in Primary and in caves which are Standing waves as Resonance phenomenon**, the Angular –momentum being Identical to the Spin of Particles, and which is trapped in caves’s loops always being in Phase with each other. Their amplitude of Oscillation varies from Zero at Nodes to maxima at Antinodes.

The **N loops are**, the **N, Sub - Stores** created in the **Main-Store**, r , and this because Energy Momentum vector, \bar{B} , follows the Stationary -Wave -Nodes Principle in Material–point only.

It has been confirmed that, when Matter and Antimatter annihilate at rest or when Anti-space comes in contact with its regular Space counterpart, they mutually destroy each other and all of their Energy is converted to the **Three Breakages $\rightarrow s^2, -|\bar{v}|^2, [2\bar{w}] \cdot |s| |r| \cdot \nabla i \leftarrow$** where for, $\bar{v} = s \equiv$ the cave,

- $[s^2] \rightarrow$ is the Real part, **Matter**, of the new monad, and is **a Positive Scalar magnitude**.
- $-[s^2] \rightarrow$ is the always Negative part, **Anti-matter**, which is always **a Negative Scalar magnitude**.
- $2s^2 \cdot \nabla i \rightarrow$ is the double Angular-Velocity Term, **The Energy Term**, which is **a Vector magnitude**,

And since **Energy is motion** and, **Total-Energy of Elementary -Particle** is equal to the \rightarrow **Intrinsic Rotational + Kinetic Energy from velocity**, then according to the conservation law of Energy, **This Energy is stored into Neutral caves as Stationary Loops**, and thus producing the **Space and the Anti - Space Particles**, with velocity vector the remaining of Energy Term.

The Trapped - Energy into the Stationary Energy - Loops of monads becomes the Outward Wave with Kinetic Energy for those monads, the Photons, **which cave follows the Cycloidal-motion**.

Because Motion is obtained either by Pushing or Attracting, so both cases presuppose, NOT the Continuity of points which points are nothing, But Discontinuity, **Discrete**, with the dimensional Units as filling as this was shown in Zenon Paradox (1), i.e. through **The Granular Space**.

Advancing from Primary to compound elements as Atoms are, or **Discrete Energy- monads**, then by following above logic for, **Primary Particles or Atoms**, is formulated a **Geometrical formula of all Moulds** [Space \leftrightarrow Anti space - Energy] $\equiv [\oplus \leftrightarrow \ominus] - [\bar{v} \cdot \nabla i]$, **without any Assumptions, or Axioms, or Exclusion Principles, or any other Starting Points**.

In a few words Energy \equiv Motion \equiv Quantized constant Quantity, and Exists because of Opposition. Is trapped in Energy - caves in case of Circular-motion \equiv { Stationary Waves \equiv The monads }, Is getting Out in case of Skin-effect \equiv { Formulated in the three Moulds of \rightarrow [Space –Anti space-Kinetic Energy] },

Never vanishes , But continuously changes to the three Moulds , formulating the Primary and Compound elements of this cosmos .

IN PREFACE ATOMS ENERGY STORES AND PHOTON

Article [67] is a Summary of prior [64-65-66] and because of its energy value , I believe that a wider discussion of it is for the benefit both the scientific development of knowledge from misconceptions of science , the application to new sources of energy , and in which is referred ,

a.. The Material points are produced from the unclashed , Matter (+) and Anti-matter (-) , lying into Energy-Chaos and following the Glue-Bond-Principle and NOT the Forced-collision .

b.. The Spin of monads which is the Angular-Momentum vector , B , due to the eternal rotation of (+) Space around the (-) Anti-space and the HOW and the WHY Spin is $\pm \frac{1}{2}$ or ± 1 .

c.. Part of the Total-Energy produced in Primary particles from a ,Circular-motion, is trapped into wavelength λ , of particles as a Stationary-wave with 1,2,3,, n , lobes and , n , frequencies following the Stationary-Wave-Nodes-Principle and which consists the Energy-tanks of particles .

d.. Part of the Total-Energy produced in Primary particles from a ,Cycloidal-motion, is stored in Energy-tanks of cave , λ , as the , n , frequencies due to oscillations , and additionally because of the centrifugal acceleration is created the Skin-effect at Stress-common-curve and the Kinetic-energy as an Electromagnetic-wave moves Outward the cave . Electromagnetic-wave and others are following the Breakage-Principle which is [(+) Space as the Electric-field , (-) Anti-space as the Magnetic-field , and ($0=\lambda$) the Energy-loop as the Energy-tank of particle .

e.. In case of the Compound particles as the Bohr model of atoms Breakage-Principle is still existing , particularly on the three Constituents and on all Total structure (formation) as , the Nucleus = The Space = the matter and the equal in charge counterpart Electron = The Anti-space = the Anti-matter , and Orbitals = The Energy loop as the Energy-tanks of atom. All above were analytically presented in the three prior articles and the present is a general summary of forgoing.

All above detected are very useful in Nanotechnology and in all science .

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.Heisenberg (1883-1886) 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] Zeno`s Paradox, nature of points in quantized Euclidean geometry, <http://www.scribd.com/mobile/doc/59304295>
- [16] The decreasing tunnel, by Pr. Florentine 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 and Energy on Dipole Vectors and on Spin ,

- <http://www.vixra.org/abs/1303.0152>
- [24] Quaternion`s, 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] Planks Length as Geometrical Exponential of Spaces, <http://www.vixra.org/abs/1406.0063>
- [29] The Outside Relativity Space – Energy Universe, <http://www.scribd.com/mobile/doc/223253928>
- [30] Universe is built only from Geometry Dipole, Scribd : <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 fundamental Origin of particles in Planck`s Confinement. On Scribd & Vixra (FUNDAPAR.doc)
- [34] The fundamental particles of Planck`s Confinement. www.ijesi.com (IJPST14-082601)
- [35] The origin of The fundamental particles www.ethanpublishing.com(IJPST-E140620-01)
- [36] The nature of fundamental particles, (Fundapa.doc).www.ijesit.com–Paper ID:IJESIT ID: 1491
- [37] The Energy-Space Universe and Relativity IJISM, www.ijism.org–Paper ID: IJISM – 294 [V2,I6,2347-9051]
- [38] The Parallel Postulate, the other four and Relativity (American Journal of modern Physics , Science PG – Publication group USA) ,1800978 paper .
- [39] Space-time OR, Space-Energy Universe (American Journal of modern Physics , science PG Publication group USA) 1221001– Paper.
- [40] The Origin of ,Maxwell`s-Gravity`s, Displacement current . GJSFR (Journalofscience.org) , Volume 15-A , Issue 3 , Version 1.0
- [41] Young`s double slit experiment [Vixra: 1505.0105] Scribd : <https://www.scribd.com/doc/265195121/>
- [42] The Creation Hypothesis of Nature without Big-Bang. Scribd : <https://www.scribd.com/doc/267917624/>
- [43] The Expanding Universe without Big-Bang . (American Journal of modern Physics and Applications Special issue: <http://www.sciencepublishinggroup.com/j/> / Science PG-Publication group USA – 622012001– Paper.
- [44] The Parallel Postulate and the other four , The Doubling of the Cube , The Special problems and Relativity. <https://www.lap-publishing.com/>. E-book. LAMBERT Academic Publication .
- [45] The Moulds for E-Geometry Quantization and Relativity , International Journal of Advances of Innovative Research in Science Engineering and Technology IJIRSET : <http://www.ijirset.com/..Markos Georgallides>
- [46] [M] The Special Problems of E-geometry and Relativity <http://vixra.org/abs/1510.0328>
- [47] [M] The Ancient Greek Special Problems as the Quantization Moulds of Spaces. [www.submission.arpweb.com\(ID-44031-SR-015.0](http://www.submission.arpweb.com(ID-44031-SR-015.0)
- [48] [M] The Quantization of E-geometry as Energy monads and the Unification of Space and Energy . [www.ijera.com\(ID-512080.0](http://www.ijera.com(ID-512080.0)
- [49] [51] The Why Intrinsic SPIN (Angular Momentum) $\frac{1}{2}$ -1 ,Into Particles . [www.oalib.com\(ID-1102480.0](http://www.oalib.com(ID-1102480.0)
- [50] [M] The Kinematic Geometrical solution of the Unsolved ancient –Greek Problems and their Physical nature <http://www.jiaats.com/paper/3068.ISO 9001>
- [51] [M] The Nature of Geometry the Unsolved Ancient-Greek Problems and their Geometrical solution [www.oalib.com\(paper. ID-1102605.0](http://www.oalib.com(paper. ID-1102605.0) <http://www.oalib.com/Journal:paper/1102605>
- [52] E-Geometry , Mechanics-Physics and Relativity, <http://gpcpublishing.com/GPC : volume 4, number 2 journal homepage>
- [53] [M] Material-Geometry and The Elements of the Periodic-Table .

[www.ijerm.com\(ID-0306031.0\)](http://www.ijerm.com(ID-0306031.0))

- [54] The Material-Geometry Periodic Table of Particles and Chemistry . <http://ijemcs.in/>
- [54] The Material-Geometry A-Periodic Table of Particles and Chemistry. www.iosrjournals.org)
- [55] Material-Geometry , the Periodic Table of Particles , and Physics. <http://ephjournal.com>
- [56] Big-Bang or the Glue-Bond of Space , Anti-space ?? . (www.TechnicalDean.org)
- [57] The Eternal Glue-Bond of Space , Anti-space , Chemistry and Physics
www.globaljournals.org .
- [58] Big-Bang or the Rolling Glue-Bond of Space , Anti-space , book@scirp.org , <http://www.scirp.org/>
- [59] STPL Mechanism is the Energy – Space Generator . <http://viXra.org/abs/1612.0299>
- [60] The Chaos becomes Discrete through the STPL mechanism which is Energy-Space Generator (<http://www.ijrdo.org/>)
- [61] The How Energy from Chaos , becomes Discrete Monads . <http://www.ephjournal.net/>
- [61-A] The How Energy from Chaos , becomes Discrete Monads . <http://www.ijrdo.org/>
- [62-B] The Geometrical solution of All Regular n-Polygons . <http://www.irjaes.com/>
- [62] The Geometrical Solution of All Odd – Regular – Polygons , and the Special Greek problems
<http://www.irjaes.com/>
- [63] The Geometrical Solution of All Odd – Regular – Polygons , the Special Greek Problems and their Nature . <http://www.ijerd.com/>
- [63] [A] The Geometrical Solution of The- Regular – Polygons , the Special Greek Problems and Their Nature . <http://vixra.org/>
- [63] [B] The Geometrical Solution of The- Regular – Polygons , the Special Greek Problems and Their Nature . (<http://iosrmail.org/>)
- [64] [A] The How energy from chaos becomes the \rightarrow Spin , of the Discrete Elementary monads .
<http://www.i-b-r.org/> .??
- [64] The How energy from chaos becomes the \rightarrow Spin , of the Discrete Elementary monads :
(<http://www.ijrdo.org/>)
- [65] The Spin of monads and their Energy-Stores . www.ajer.org .
- [66] [M] The Energy-Stores in Photon . <http://www.i-b-r.org/> .???
- [67] [M] The Energy Structure of Atoms and Photon . <http://viXra.org/> .
- [68] [M] The unification of Energy-monads , *Black Holes* , with Geometry-Monads , *Black Matter* , through the Material – Geometry – *Automobile Forces* in monads .
- [69] [M] Material Geometry and , The origin of Black-holes , Black-matter .
- [70] [M] The origin of SPIN of the fundamental Particles and their Eternal motion.
- [71] [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 dynamic hologram .

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