

The Wave & Particle Duality-Photon, Cosmic - Particles Origination & The Stability in Cosmology

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Abstract :

*It was Proved That The Elements in Nature are Only Two , That of **Space** as the E-Geometry Shapes and Rules , and **Energy** ≡ **motion** as Vectors , Lines , Planes , Volumes , n Volumes under the Restrictions of an-Magnitude and an **Direction** , and thus , **Point which is Nothing** , with None - Magnitude and Direction { and is **Quandized** } as an **Magnitude with Direction** , and becomes The Space as Spin in Caves . or an Vector.*

*Quaternions Is , Energy as motion , or any change on State of Space , and is under the Restrictions of the Natural-**Quaternions** ≡ **A Real + An Imaginary Part** . Motion { **is Quantized** } in caves following Kepler's Second Planetary-laws as **Frequencies - Only** . The Transportation of Frequencies becomes through the **Electromagnetic-Waves** where , **Wave is The - Way of motion** , and Real ≡ **The Space** ≡ Storage ≡ Magnetic-fields and The Imaginary Part ≡ **The Energy** ≡ The Electric-fields ≡ The motion , and thus becomes the Transportation which such is the Photon , i.e. Particle and Wave . Because **Quantized-Spaces** become from the motion in Magnets which have the $\pm$ Charges , + , - , so , these two Elements consist The Only Raw-Material of all **The-Energy-Structures** and consist An **2 and 3-Phase Electromagnetic-Rotor** .*

*Since Equal Quantities Equilibrium , so issues $[(+) - (-)] \equiv 0$, and this is The Material-Geometry like $[\oplus , \ominus , \emptyset]$ and followed by Nature ≡ The Objective - Reality . The motion in Caves and of any Raw - Material creates a Reaction , The called mass , and The **Heap of masses and Charges** is That configuration which forms **That Harmonic Oscillations** which create the **Primary Particles** . The United Coulomb Newton-Law for Interactions , is the Extreme case of any Two Touched Charges in Fields Producing The Nutation of Orbiting-Electrons . Elementary Particles become from the **Permutations of The Three Elements in Sub-Space** , and the Inter-Voltage-Points P , D in STPL-line with **Forces the Waves Constructive and Destructive-Interference** , and Placed The $\oplus$ Space and The $\ominus$ Anti-Space at the **Two-Nodes of The Standing-Waves -Wavelength** . The Link between the Gravitational constant G and all The above is the [Particle & Wave Photon] which as Particle is The Natural frequency f_N , in an Stationary – Wave - Storage , and as Wave An Propagating Electromagnetic - Wave of wavelength , λ .*

*Photon as EM-Wave follows Geometry-Moulds and Rules as that of the , **Three Poles Rotational-Squares-System** to Produce The **Geometry - Units** as , Unit-Length , Unit-Plane , Unit-Volume , Through the **Energy , Three Vectors Tetrahedral** .*

*The **Unit-Energy-Stress-Vector** $|\oplus Q \Rightarrow \overrightarrow{Q} \ominus [\overrightarrow{Q} \Rightarrow] \equiv |\vec{e}| \times \frac{3}{2}$ is the Interaction of The , + , Constituent To , - , Constituent in The First **Physical [STPL] Conductor** . Since Geometry consists The Space and Material-Geometry The Energy ≡ **motion** Therefore , **Unit-Energy-Stress-Vector** , Enters into The Space as , an Equal Energy-Sphere $\frac{4\pi}{3} r^3 [\overrightarrow{Q} \Rightarrow]$ and is Duplicated to Doubled Equal Unit-Energy-Sphere $2 \cdot \{\frac{4\pi}{3} r^3 [\overrightarrow{Q} \Rightarrow]\}$, following Cube-Duplication . **It was Shown** How motion becomes the Wavelength λ of EM-Waves as **Duality-Photons And Propagates** , carrying This Double Sphere as , EM -Wave with velocity $c = \frac{w}{k}$ And **Energy-Vector** $k = \frac{2\pi}{\lambda}$ in Wavelength λ . **THE Diameter D** of a circle IN **STPL Three-Poles-Square-R-System** IS the **E-Conductor** , And Since motions, $\vec{B}, \vec{w}$ are Constants then from , Poinot $w_1^2 + j_2 w_2^2 = a^2$, Angular velocity-Ellipsoid is Symmetrical to , z , axis , And All of equal distance from , O , Tangential Planes , Are Symmetrically Placed around , z , axis and **Polar - Paths** are **Parallel circles** . The **Squared Unit-Energy-Stress-Vectors** $k_x \perp k_y \equiv [\overrightarrow{Q} \Rightarrow]$ **BECOME** An Circular-Cone on equal E-Sphere , to An **Movable-Doubled-Energy-Sphere** , to An **E-Sphere - Cone** $\equiv \mathbb{C} k \cdot \pi \cdot r^3$, And it **Is-An Electromagnetic-Wave** , as [It is The Quanta of Energy q] , in Storage $[\vec{f}_n]$ and Propagating-Energy $\vec{f}_n$, in Energy-Space Conductor $D \equiv \lambda \equiv 2 \cdot r$. The Stability of Energy-Cosmology-Sphere follows That of Material Geometry Rules .*

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A.. : GENERAL

- 1...The **Objective Reality** is composed of two elements , that of **Distance** . *The Space* ds , and that of **Motion** , *or else the called Energy* , and it is the content of all sciences [32]
- 2... **Euclidean-Geometry** describes the Space only but Not the Energy , the *motion* .. [48] .
- 3...The Solution of all the Unsolved-Ancient-Greek-Problems [50] opened the way to the **Material-Geometry** [54] which Incorporates the Motion → In-Space as $(\oplus \leftrightarrow \ominus)$, [61] .
The Space exists in Energy-Caves as **Energy-Quantum-Quantities** [39] , while Motion or **Energy exist** in Caves as an **Confined-Stationary-wave** which is either Static or an moving Energy-Storage or an Energy-Box [68] . The Any-Two Opposites (+) , (-) exist in Nature and are found everywhere from → Zero-Point (0) $\equiv [+ = -]$ or $(+ A) + (- A) = 0$ in E-Geometry and → $[0] = [\oplus \leftrightarrow \ominus] \equiv f_n$, $[\oplus \leftarrow ds \rightarrow \ominus] \equiv ds$ in Material- Geometry ,to the aperon , $\pm \infty$,

where in **The Space** $\equiv ds$, *nodes distance*, **the motion exist as Vibration** [52].

4...The PrimaryMaterial-Point is composed of Infinite-Material-Points in the TwoAperon which consist a Huge Magnet with Infinite Parallel-lines ,where the $\oplus$ constituent moves as for Newton-Gravitational-constant G-force Periodically to $\ominus$ constituent [82-86].

5... Gravitational-Force G, Acting in the **Beyond-Planck** - Cave , and on the light Velocity

Vector $\vec{c}$, creates Electron-Charge $\bar{q}_{\text{Electron}} = \frac{G}{c\sqrt{2}}$ and the Material-Points $\bar{q}_{\text{Photon}} = \frac{G}{\sqrt{2}.f}$ while by effecting on the **Whole-Planck-Cave** $L_P \equiv e^{i \cdot (-5\pi/2) \cdot 10}$, creates the Pointy-Gravity Force as this is the **Ocean of Spins** $\bar{g}$, and which Oriented-Spins, **Originate Gravity g** and **Electron $\bar{e}$** [72]. Light-Velocity $\vec{c}$ acting on a-cave, $r = \frac{h}{c.Z_c} \neq L_P$ originates Hydrogen-cave.

6...The Rotation of the Two Elements, $[\oplus \cup \ominus]$, Up or Down in the Material-Point-circles

Originates the Spins, $\pm \frac{1}{2}$, ± 1 , $\pm \frac{1}{2}$, for All-Particles **Fermions or Bosons** which become from above Three-States of motions, just by Adding the Spins [36].

Linear Motion $[\oplus \leftrightarrow \ominus]$ of Breakage $[\pm \vec{c}.s_m^2]$ in cave $\{M\text{-Point} = d s_m = e^{i \cdot (\frac{N\pi}{2})^{b=10^{-N}} = \pm \infty} m\}$ as velocity, $v = w r = 2\pi r.f = \sigma \Phi$, in the Great and Small circles of Glue-Bond rotation, creates

the **Three-States of frequencies** $f_{\pm 1/2} = \frac{(1+\sqrt{5})\sigma}{8\pi r}$, $f_{\pm 1} = \frac{(1+\sqrt{5})\sigma}{4\pi r}$, $f_{\pm 1/2} = \frac{(1+\sqrt{5})\sigma}{8\pi r}$, and energy

$E = h f_m$, because **Angular-Momentum $\vec{B} = \frac{2L}{w} = \frac{2L}{2\pi f} = [\frac{2L}{2\pi}] \cdot [\frac{1}{f}] = \frac{\text{Constant}}{2\pi} [\frac{1}{f_m}] = \text{SPIN}$** [70]

7...When the Unit-Quantum-Energy in Planck-length is equal to the Stress of Gravity g, and enters the minimum-cave a as the **Critical-Unit** in orbit ,then is measured frequency f_p which is giving the

Least-Unit-Energy-cave and that is of **Hydrogen - Cave H**, [81], as the Energy-equations,

$r = \frac{h}{c.Z_c}$, $g.a^3.f_p^2 = 1$ and from where $E = h f_p = 13,6 \text{ eV}$.

8...When the Unit-Quantum-Energy k in Planck-length is equal to the Stress of Gravity g, and

frequency f_e becomes from Hydrogen Least-Unit-Energy $= \pi g$, then, Reaction = mass, is that of the **Electron Cave e**, as Kepler-equation, $4\pi^2 f_e^2 . m_e = k = \pi g$ and $m_e = g / [4\pi f_e^2]$, [82]

9...The Rotation around the $\oplus$ constituent, of the Confined-Electron $\ominus$ constituent in the Potential-Energy

of Hydrogen-cave, which consists a configuration of masses m_p and of Charges q_e , **Originates**, the **Uniform-Magnetic-field $\vec{B}_L$ of Atom**, the Spin of Atom connected with that of Electron-Spin, and **Forms** an Harmonic Oscillator with a Natural Frequency f_N with the less Damping-factor by Increasing of Potential Energy in loop due to Nutation-motion. Since Electron is continually-oscillating with the Nutation-frequency f_N , so Produces an **oscillating magnetic-field $\vec{B}_N$** , which in turn is the source of an oscillating Electric-field $\vec{E}_N$, which implies the Regeneration each other and which is a Propagating Electromagnetic-Wave related as $\vec{E}_N = \vec{B}_N \cdot c$ and with an Phase difference $[\varphi = \frac{\vec{B}}{\Phi}]$. [86]

10...This Resonance - frequency f_R is Independent of the Electron's speed and radius so this Proportion allows **Bonding between Atom-caves** which contain a Formation, a Heap of Masses and of Charges. In a Proper- Stationary-Magnet on which the Rotational-motion becomes as linear Oscillation and thus is succeeded a clear Magnetic-Resonance-Imaging [The MRI, MEDIA], [86].

11... Constant force G is effecting on Gravity, g, and in turn g is acting on Electron $\bar{e}$ in the Hydrogen-cave which Originates the Nutation-motion in this Precession as an $\rightarrow$ **Cyclotron-Resonance-frequency** $\leftarrow$

$f_R = \sqrt[4]{\frac{1}{4\pi^2 m_e . r^3}}$ of cave, r, and the produced-Energy $\equiv$ motion is stored in the Orbit as an New

Uniform-Magnetic-field $\vec{B}_F = |\frac{2\pi.M_T}{Q_T}|f_R$ independent of **velocity and cave**, which becomes The **Bond** between the Atoms to be Molecules, i.e. Bonds are the Magnetic - lines of the Uniform-field. [80]

12...During Nutation of Electron-SPIN, and because of the Eternal-Varying-Velocity motion in Orbit

Precesses, **the Produced-Work** of $[\oplus = \text{Proton}, \ominus = \text{Electron}]$ is Conserved in the **Nucleus-Orbit Magnet**, as the Nucleus-Magnetic-Moment, which is influenced by Any External-Magnetic-field.

The continually Conserved Energy becomes the frequency $f_N = f_R$ and is **Resonated to the Electron-Spin**, OR to Any Set External-Magnetic-Field-moment. [N] Articles IN - GOOGLE $\rightarrow$ by Georgallides Markos.

13... The Priors :

Article [87] is the completion of [72-80] and [80-86] of the Physical interpretation of the Two constants of nature, that of Newton's Gravitational constant **G**, and light velocity $\vec{c}$, with Derivatives the Photon-Charge $\bar{q}_{\text{Photon}}$ in Material Point cave r, Gravity Constant **g**, and Planck constant **L_p**, with a Rigorous Geometrical and Mechanical logic. It was shown [33-39] that from *< The Balancing of Space, Anti-Space in a Rotating Sub-Space Common circle >* Un-clashed Fragments through center, O, consist the Medium-Field Material-Fragment $\rightarrow [\pm s^2] = [\text{MFMF}] \equiv \text{The Chaos}$, as base for all motions, and Gravity as force $[\vec{V}i]$, while the clashed with the constant velocity, $\vec{c}$, consist the Dark matter $[\pm \vec{c}.s^2]$ and the Dark

Energy $[\bar{c} \cdot \nabla i]$, **Declaring that** $\rightarrow$ Antimatter-Galaxies and Antimatter-Asteroids can exist only as Dark-matter or and Dark-Energy and **NOT** as Antimatter light , $(-c)$, alone , or from $\rightarrow$ velocity - Breakages , $[\pm s^2 = \pm (wr)^2]$ and $[\nabla i = 2(wr)^2]$, where then become the **Waves** { *On distance* $ds = |AA_E|$ *is the Work embedded in monads and it is what is vibrated* } and the **Material-Points** with their Vibrating equations of motion . Vibration is the motion in Waves and is transported as Electromagnetic-Radiation . For Photon-Material-Point exists the **Duality** of an **Energy-Storage** $S \equiv [\oplus \leftarrow r \rightarrow \ominus]$ and the **Motion** $M \equiv [\bar{v} - \text{Vector}]$ as in [87].

From vibration in Material-Points become , [55]

- A $\rightarrow$ The Particles , with Inherent Vibration occupying distance $r = ds = |AA_E|$,
 - B $\rightarrow$ The Gravity-Field-Energy without Vibration , the only Stationary-Rotating Photon-Spinning-Material-points .
 - C $\rightarrow$ The Dark-matter-Energy constituents as below ,
 - A.. $[\pm \bar{v} \cdot s^2] \rightarrow$ The Fermions , *Quarks and Leptons* , and $\rightarrow [\pm \bar{v} \cdot \nabla i] \rightarrow$ Bosons ,
 - B.. $[\pm s^2] \rightarrow$ The [MFMF] *Neutral Field* $\equiv$ **The Equilibrium Energy - Chaos** , with the *Negative-Energy* binder Field $[\nabla i]$.
 $\rightarrow$ The Gravity force G_f
 - C.. $[\pm \bar{c} \cdot s^2] \rightarrow$ Dark-matter , and the binder Gravity-force $[\nabla i]$, $[\bar{c} \cdot \nabla i] \rightarrow$ The Expanding Dark Energy , *Positive-Energy*, which both are moving with light velocity c , causing the Universe to grow.
- From above in , A , and , C , case $\rightarrow$ Energy as velocity $\bar{v}$, and , $\bar{c}$, exists in the , **Quantized** , *Discrete monads* , $\pm \bar{v} \cdot s^2$ and $\pm \bar{c} \cdot s^2$.

B , case is the Transportation of Energy , from Chaos to Stationary Material points .

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

- $[\pm s^2] \rightarrow$ MFMF Field $[\pm \bar{c} \cdot s^2] \rightarrow$ DM-DE Field of , Dark matter and Anti-matter
- $[\pm \bar{v} \cdot s^2] \rightarrow$ Fermions $[\nabla i] \rightarrow G_f \equiv$ Gravity -Force in DM-DE Stationary Field .
- $[\bar{v} \cdot \nabla i] \rightarrow$ Bosons , $[\bar{c} \cdot \nabla i] \equiv DE \rightarrow$ Dark Energy $c \times$ (©) $[\nabla i]$
 $\rightarrow$ Gravity Force $DE \equiv [\bar{c} \cdot \nabla i] = \bar{c} [\nabla i] =$ The Travelling-Energy-cave , c ,
 with the velocity-vector , $\bar{c}$,

In all above issue Kepler-laws , denoting that **Macrocosm and Microcosm**

Obey Newton's Laws of motion in all Scales , as this was in prior proofed . [56]

In [68] is shown that Motion may be **Linear or Rotational** for any displacement r , so exists a **Constant -Work** $= k$, during these motions of velocities $\bar{v}$, and since Energy is vectors then

$$k = \bar{v} \times \bar{v} \cdot \bar{r} = v^2 \cdot r \cdot \bar{n} = v^2 \cdot r = (wr)^2 \cdot r = \left[\frac{2\pi r}{T} \right]^2 \cdot r = \frac{4\pi^2 r^3}{T^2} \cdot r = \frac{4\pi^2 r^3}{T^2} = 4\pi^2 \frac{r^3}{T^2} = 4\pi^2 \cdot r^3 \cdot f_p^2 \quad \text{i.e.}$$

Above constant work k , is composed of the Two velocity vectors $\bar{v}$ which are , One for the Space-motion monad , r , and one for the Energy-motion-monad $4\pi^2 r^2 f_p^2 \equiv [2\pi f \cdot r]^2 \equiv [wr]^2 \equiv v^2$. For Photon during Motion in [MFMF] $\equiv$ Chaos , collides with other Photons by means of Cross - Product and Produces a constant Work which is stored **into the Only-Four Energy - Geometrical - Shapes** , of the motion which shapes are the Conic-sections . The Interior motion is kept in its Wavelength-Tank $2r = n\lambda$, as well as the Outer-Linear motion as an Propagating Electromagnetic-Wave , which carries the Energy-conveyer,

i.e. The stored energy in the loop is $\rightarrow W_1 = v^2 \left[\frac{h}{2\pi} \right] = 4\pi^2 \cdot r^3 \cdot f_p^2 = k$, where as **Wave** is Frequency

$[f_1 = (E^2 + H^2) = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{2nB}{\pi^2 r^4}]$ and **Particle** as velocity $[\bar{v} = \bar{c} = \lambda \frac{f}{\phi}]$ which is dependent on velocity , v , and Planck's constant h , or **on loop** , r , and it is **frequency** f_p , which represents the Wave . It is proved that this minimum wave - constant $\rightarrow k = \pi g$.

For The Duality-Photon $\rightarrow \{ \bar{c} \cdot [\bar{f}_n] + \bar{c} \cdot f_n \} \leftarrow$ is proved that ,

1.. Energy-Storage $S \equiv [\oplus \leftarrow r \rightarrow \ominus] \equiv$ **Particle** $[\bar{v} \cdot [\bar{f}_n]] \rightarrow [\bar{v} = \bar{c} = \lambda \frac{f_1}{\phi}] \rightarrow$

And is an Stationary Standing - Wave $\rightarrow \{ S \equiv EM-R \equiv [f_1 = N, f_2, f_3, f_D, \dots, f_n = w^2] \}$.

2.. Energy-Motion $M \equiv [\bar{v} - \text{Vector}] \equiv$ **Wave** $[\bar{v} \cdot f_n] \equiv [f_1 = (E^2 + H^2) = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{B}{\pi^2 r^4}]$

and it is a Propagating Wave $\{ W \equiv EM-R \equiv [\epsilon E^2 + \mu B^2] = 2 \cdot \lambda c \cdot \sin 2\phi [\phi = \frac{B}{\phi}] \}$.

3.. Gravitational-constant $G \equiv \Phi^2 \cdot [\{\sigma \Phi\} = 2\pi f_p r \equiv w r \equiv \bar{v} \equiv m g = \bar{c} = \frac{2B}{\pi r^3}]$

B... THE TOTAL WORK DUE TO MOTIONS . :

It was shown in [58] that the maximum velocity in a closed System occurs in Common circle , when the two velocities , $\bar{c}$, $\bar{v}$ are Perpendicular between them , and Work is not produced . From them a dispersion follows Pythagoras theorem and the resultant Quantized linear Space length , r , becomes , as the Resultant of Energy Vectors $r = |(\bar{c} \cdot T)| = \sqrt{v^2 + c^2}$ and by using Geometry-Space Vector $\bar{r} = |(\bar{c} \cdot T)| = \sqrt{v^2 + c^2}$ then The total

Rotating energy $\bar{A}$ is $\rightarrow \pm \bar{A} = \bar{p} \cdot r = (M \cdot c) \cdot r = (M \cdot c) \cdot \sqrt{v^2 + c^2}$ and squaring both sites then
 $[\pm \bar{A}]^2 = p^2 \cdot r^2 = M^2 \cdot c^2 \cdot (v^2 + c^2) = (M^2 \cdot v^2) \cdot c^2 + M^2 \cdot c^4 = (p^2 \cdot c^2) + M^2 \cdot c^4 = [p \cdot c]^2 + [m_0 \cdot c^2]^2$ or is
 $E_T = E_R + E_K$ i.e. **The Total-Energy of Elementary-Particle $\equiv$ Intrinsic Rotational + Kinetic Energy**,

1-b... The Beyond Planck-Scale $r < L_p = 1,616199 \cdot 10^{-35}$ m : Preliminaries :

In [23] was shown that , Any Distance AB between Two-Points is **Quantized as** , $ds = |AB|/n$,

$$[A] \quad ds = (AB / n = \infty) = 0 \quad [B] \quad [A] \quad ds = \rightarrow = AB / n = 1 \quad [B]$$

.....
Continuous as Points (.) **Discrete as monads ($r \equiv ds = 1 \rightarrow n$)**

Work done (W) by Impulse (P) on a Virtual displacement ($ds > 0$) is zero , or
 $W = [A \cdot B = [P \cdot ds] = 0 \rightarrow [ds \cdot (P_A + P_B) = 0] \rightarrow P_A \equiv \text{Points in Space [S]}$
 and $P_B \equiv \text{Anti-Space [AS]}$ or $[ds \cdot (P_A + P_B) = 0]$, Therefore , Each Unit
 $AB = ds = r > 0$ exists , by this Inner Impulse (P) and so $P_A + P_B = 0$ i.e.

The Position and Dimension of all Points which are connected across the Universe and that of Spaces exists , because of this Static Inner Impulse , on the contrary should be one Point only (Primary Point A = Black Hole $\rightarrow$ where $ds = 0$ and $P = \infty$) . [70]

It was shown that in PNS , $v = \infty$, $T = 0$, meaning that **velocity is infinite and Time is not existing and thus any length |AB| in [PNS] is constant** , because $AB = ds = \text{Constant} = v \cdot 0 = \infty \cdot 0$.

Straight line AB is discontinuous (discrete) with dimensional Units , $ds = AB / n$, where $n = 1 \rightarrow \infty$ and continuous with Points [$ds = 0$] , (This is the Dual Nature of lines in , geometry , as discrete and continuous) . From Definition , Work $W = \{ \text{Force} \times D = \text{Displacement} \} \equiv$

$\{ \text{Momentum [mv]} \times \text{Distance [r]} \} \equiv \mathbf{mv} \cdot \mathbf{r}$, or $W \equiv \mathbf{mv} \cdot \mathbf{r}$, exists Work where ,

1... $\rightarrow$ Distance r Becomes from Material-Geometry where the Quantization of Space for the

Rotated Energy case ($s = 0$ and $\cos \varphi = 0$) , In-Primary-Quaternion $[s + \bar{v} \nabla i]^{1/w} = e^{-i(\pi/2 + 2k\pi) \cdot w}$

{for angle $\varphi = \pi/2$, dimension power $w = b = 10$ and $k = 0$ } exists the minimum-Energy-Cave r.

For low base $e = 2,71828$ and up base $b = 10$ then $e^{\wedge} - (16,1181) = 1 \cdot 10^{-7}$ or $r = 1,07 \cdot 10^{-7}$ m

$r_{\min} = 1,07 \cdot 10^{-7}$ m $\rightarrow$ i.e. $r_{\min} \equiv$ The minimum Energy-Space-Cave $\equiv$ **Space-Quantum** .

Placing the $\rightarrow r_{\min}$ in the Dynamic-Space-Energy relation , $g \cdot r^3 \cdot f_p^2 = 1$, when $g = 1$, then ,

$f_p^2 = \frac{1}{r^3} = 8,0647139 \cdot 10^{20}$ m , and $f_{\min} = 2,839844 \cdot 10^{10}$ H , which is the **Electron-Nutation-frequency**.

2... $\rightarrow$ Frequency $f = f_{\min} = 2,839844 \cdot 10^{10}$ H $\equiv$ The minimum Energy in Cave $\equiv$ **The-Energy-Quantum**

From wavelength-relation $n \lambda = 2r = n v / f$, exists $v = \lambda f$ or $\rightarrow \bar{v} = \bar{c} = \lambda f$. and since

$v = w r = [2\pi/T] \cdot r = 2\pi \cdot f_1 \cdot r$, wavelength $\lambda = c T = c / f_1$, and from cave $r = n \cdot [\lambda/2] = n \cdot (c/2f_1)$

then $v = 2\pi \cdot f_1 [n c/2f_1] = n \cdot \pi \cdot c$, or $v = n \cdot \pi \cdot c$. i.e. $\rightarrow$ **The Quantum of velocity vector is constant c** .

From Constant-Energy Orbit-relation $k = [\bar{v} \times \bar{v}] \cdot \bar{r} = v^2 r = (w r)^2 \cdot r = [\frac{2\pi}{T} r]^2 \cdot r = \frac{4\pi^2 r^2}{T^2} \cdot r = \frac{4\pi^2 r^3}{T^2} = 4\pi^2 r^3 f_{\min}^2 = [2\pi f \cdot r]^2 \cdot r = [n \cdot \pi \cdot c]^2 \cdot r \equiv$ **Kepler Universal - Laws for macrocosm and microcosm** .

Frequency $\rightarrow f_{\min}$, becomes from velocity relation $v = w r = 2\pi f \cdot r$, as $f_{\min} = \frac{v}{2\pi r_{\min}}$ or

$$f_{\min} = \frac{v}{2\pi r_{\min}} = \frac{n\pi \cdot c}{2\pi r_{\min}} = \frac{n \cdot c}{2 \cdot r_{\min}} = \frac{2,99810^8}{21,07 \cdot 10^{-7}} = 1,4009345 \cdot 10^{14} \text{ H}$$

From momentum relation $B = m r v = m r^2 w = m r^2 (2\pi f) = \frac{J \cdot w}{2} = [\frac{\pi r^4}{4}] \cdot [2\pi f]$, then the Mass

of the Elementary - Particles begins from $m = \frac{\pi \cdot r^2}{4} = \frac{\pi \cdot (1,07 \cdot 10^{-7})^2}{4} = 8,992023 \cdot 10^{-15} \text{ Kg}$ or ,

3... $\rightarrow$ Mass $m = m_{\min} = 8,992023 \cdot 10^{-15} \text{ Kg}$. while from relation $B = r m v = \frac{\pi^2 r^4}{2} f$, then

Planck mass $m = \frac{\pi^2 r^4 f}{2rv} = \frac{\pi^2 r^3 f}{2c} = \frac{\pi^2 (1,07 \cdot 10^{-7})^3 \cdot 1,4009345 \cdot 10^{14}}{2 \cdot 2,99810^8} = 2,8248572 \cdot 10^{-15} \text{ Kg} = m_{\min} / \pi$.

Quantization , for $k = 1$, is the Planck-minimum-Energy-Scale Decimal-Cave $L_{\min} = L_p = e^{i(\frac{\pi}{2} + 2k\pi) \cdot b} = e^{i(-\frac{5\pi}{2}) \cdot 10} = e^{-(78,5398)} = 8,906 \cdot 10^{-35} \text{ m} = \{ \sqrt{3} \cdot \pi \cdot 1,616199 \cdot 10^{-35} \text{ m} \}$

From [70] the velocity of Elementary Particles is the Light-velocity-vector , $\bar{c} = \bar{v} = 2\pi r \cdot f_e$, and the

Frequency is $f_e = \frac{\bar{c}}{2\pi r}$ (1) . The Balancing of , Space and Anti-Space in a Rotating Sub-Space

Common-Circle happens from the $[\pm]$ equilibrium - Rotational-Energy as relation ,

$\bar{B} \bar{w} = L = \frac{1}{2} J_1 w_1^2 + \frac{1}{2} J_2 w_2^2 + \frac{1}{2} J_3 w_3^2$, or A-momentum $\bar{B} = \frac{J \cdot w}{2} = \frac{\pi r^4}{4} [2\pi f] = \frac{\pi^2 r^4}{2} [f]$... (2) Frequency $f =$

$2B \frac{1}{\pi^2 r^4} = \frac{2B}{\pi^2 r^4} = \frac{[1 + \sqrt{5}] \sigma}{4\pi r} = \frac{\bar{c}}{2\pi r} = \frac{\Phi \cdot \sigma}{2\pi r}$, or $2\bar{c} = [1 + \sqrt{5}] \sigma$... (3) A-momentum $\bar{B} = \frac{[1 + \sqrt{5}] \sigma \cdot \pi r^3}{4} = \frac{\pi r^3 \Phi \cdot \sigma}{2}$ (4) ,

where **Unit-energy-constant** is , $\frac{T^2}{a^3} = k = [\frac{4\pi^2}{G \cdot m}]$, or $ka^3 f^2 = 1$.

The Rotational Energy is $\rightarrow E_R = \bar{B} \cdot \bar{w} = 2L = J \cdot w^2 = J \frac{c^2}{r^2} = [\frac{\pi r^4}{2}] \frac{c^2}{r^2} = \frac{\pi c^2}{2} r^2$ (5)

Mass is the Reaction to any motion or change and is measured by the cave-moment of Inertia **J**.

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

$$\text{Total-Energy} \rightarrow E_T = E_R + E_K = \frac{\pi c^2}{2} r^2 + \frac{1}{2} m \cdot v^2 = 1,4118323 \cdot 10^{16} \cdot r^2 + \frac{1}{2} m \cdot v^2 \quad \dots (5a)$$

$$\text{Since Total-Energy } L = B w = \frac{J \cdot w}{2} w = \frac{J \cdot w^2}{2} \text{ then } 2L = J \cdot w^2, \text{ and } \bar{B} = r \cdot m v = r \cdot \frac{\pi r^2}{2} 2\pi f \cdot r = \frac{\pi^2 r^4}{1} f$$

$$\text{From momentum relation } \bar{B} = m r v = m r^2 w = m r^2 (2\pi f) = \frac{J \cdot w}{2} = \left[\frac{\pi r^4}{4} \right] \cdot [2\pi f], \text{ then the Mass}$$

of the Elementary Particles is $m = \frac{\pi \cdot r^2}{2}$, i.e. is dependent on the radius of cave, and for Gravity cave

$$r = 10^{-62} \text{ m}, \text{ then Material-Points mass} \rightarrow m = \frac{\pi \cdot 10^{-124}}{2} = 1,570796 \cdot 10^{-124} \text{ kg}.$$

$$\text{However from } J_1 w_1^2 + J_2 w_2^2 + J_3 w_3^2 = 2L \text{ then, } w_1^2 + w_2^2 + w_3^2 = \frac{2L}{J} = \frac{4L}{\pi r^4} = B w = 2\pi f \cdot B$$

Angular-velocity-momentum-Ellipsoid $L = \frac{B_1^2}{2J_1} + \frac{B_2^2}{2J_2} + \frac{B_3^2}{2J_3}$, where B_1, B_2, B_3 are the components of the Angular-momentum-vector along the Principal axes, and J_1, J_2, J_3 are the Principal moments of Inertia where also issues $\rightarrow B^2 = 2LJ = 2L \frac{\pi r^4}{2} = \pi L \cdot r^4$ and $\pi L = B^2 \cdot r^4 \leftarrow$

2-b.. In Planck's Scale, length $r = L_p = 1,616199 \cdot 10^{-35} \text{ m}$ velocity $v = c$:

Mass is the Reaction to any change of motion or change, and is measured by Kg.

$$\text{From velocity relation } c = w r = 2\pi r f, \text{ frequency } f = \frac{c}{2\pi r} = \frac{2,998 \cdot 10^8}{2\pi \cdot 1,616199 \cdot 10^{-35}} = 2,95236210^{42} \text{ Hz}$$

$$\text{and Period } T = \frac{2\pi r}{c} = 3,3871185 \cdot 10^{-43} \text{ s. From Angular momentum } \bar{B} = r m v = \frac{\pi^2 r^4}{1} f$$

$$\text{then mass } m = \frac{\pi^2 r^4 f}{r v} = \frac{\pi^2 r^4 f}{2\pi r^2 f} = \frac{\pi \cdot r^2}{2} = \frac{\pi \cdot (1,616199 \cdot 10^{-35})^2}{2} = 4,1030756 \cdot 10^{-70} \text{ Kg},$$

$$\text{Stress } \sigma \text{ from above equation } f_p = \frac{n \cdot \sigma \cdot \Phi}{2\pi r} \text{ is } \sigma = \frac{2\pi r f}{(n) \Phi} = \frac{2\pi r f}{1 \cdot \Phi} = \frac{2\pi \cdot 1,616199 \cdot 10^{-35} \cdot 2,95236210^{42}}{1,6180339} =$$

$$= 1,846462 \cdot 10^8 \text{ t/m}^2 = 1,846462 \cdot 10^{11} \text{ Kg/m}^2, \text{ and Angular velocity } |\omega| = \frac{\sigma}{2r} [1 + \sqrt{5}] =$$

$$\left(\frac{1,846462 \cdot 10^{11}}{2 \cdot 1,616199 \cdot 10^{-35}} \right) \cdot 1,6180339 = 1,5007013 \cdot 10^{46}, \text{ or } |\omega| = 1,5 \cdot 10^{46} \text{ rad/sec, and the constant}$$

figure of Energy is that of Stress $\sigma = 1,846462 \cdot 10^{11} \text{ Kg/m}^2 = 1,846462 \cdot 10^{11} \text{ Joule}$.

Velocities in caves become from equation $v^2 = \frac{2}{m} [E - \{ \frac{k}{r} + \frac{L^2}{2m r^2} \}] = [4\pi^2 \cdot k] \cdot \left[\frac{1+e}{r} \right]$ where

constant, $k = a^3 f_p^2$, **Is the Energy** executed by the radius, r = Focus-Planet, in a second,

and which is **The Quantum of Energy in Cave-Orbit**. From equation $E_T = E_K + E_R$, then

the Total Energy in cave is $E = \frac{mv^2}{2} + \{ \frac{k}{r} + \frac{L^2}{2m r^2} \}$ where $L = S$ = the Spin of Particles, k = Unit energy.

From **Mechanics** In the One degree of freedom Vibration of a mass, m , and Stiffness, k , in a distance, a , is for frequency, $w^2 = [k/m]$ and equation, $m \ddot{x} + w^2 x = 0$, with solution $\rightarrow$ the Period

$$T = 2\pi \cdot \sqrt{\frac{m}{k}}, \text{ frequency } f_H = w / 2\pi = \frac{1}{2\pi} \sqrt{\frac{k}{m}}, \text{ and Energy } E = h f_H, \text{ where, } h = \text{Planck's constant, and}$$

$$\text{from Orbit-equation } \bar{v} = \sqrt{\frac{2}{m} [E - \{ \frac{k}{r} + \frac{S^2}{2m r^2} \}]} \text{ and for } v = c \text{ then, } E = \frac{mc^2}{2} + \frac{k}{r} + \frac{L^2}{2m r^2} = h f_R$$

$$\text{From Hydrogen Orbit-motion, } r = \sqrt[3]{\frac{1}{k \cdot f^2}}, \text{ or } k \cdot f^2 \cdot r^3 = 1 \text{ and Constant-Unit-Energy } k = \frac{1}{f^2 \cdot r^3} \text{ which}$$

Energy k , is the **Quantum of Energy**, in the first Planck-length-cave.

$$\text{For Black-Holes, the Total-Energy } L = \bar{B} \bar{w} = \frac{J \cdot w}{2} w = \frac{\pi r^4}{2} [2\pi f]^2 = 2\pi^3 r^4 f^2 = r m v = r m \cdot w r, \text{ and}$$

$$\text{mass } m = \frac{2\pi^3 r^4 f^2}{r^2 2\pi f} = \frac{\pi^2 r^2}{1} f = \left[\frac{\pi r \cdot v}{2} \right] v, \text{ while Angular-Momentum-Vector } \rightarrow B = r \cdot m v = r \left[\frac{\pi r v}{2} \right] v = \frac{\pi r^2}{2} v^2$$

$$= \frac{\pi r^2}{2} v^2 = \frac{\pi r^3}{2} [n \cdot \pi \cdot c]^2 = \frac{\pi^3 r^3}{2} c^2, \text{ or Black-Hole-Energy } \rightarrow B_{EH} = 2 \cdot \pi^5 \cdot r^3 \cdot f^2 = (\pi r)^3 \cdot w^2 \leftarrow$$

i.e. **Velocity in Black-Holes is Related to Cave, r^3 , and Energy w^2 times of light velocity.**

Placing r , in the Dynamic-Space-Energy relation when $g=1$ then $\rightarrow r^3 \cdot f_p^2 = 1$ and $f_p^2 = \frac{1}{r^3}$
 $= 8,0647139.10^{20} \text{ m}$ and occurs the, **minimum frequency** $f_m = 2,839844.10^{10} \text{ H} \dots(4)$
For Electron radius $r_e = 5,82.10^{-16} \text{ m}$, Weight of Electron $Q = m_e g = 9,11.10^{-31}.9,808$
 $= 8,93.10^{-30} \text{ Kg}$, the Moment of Inertia-Disk is $J_e = J_3 = [\pi a^4/2] = \pi/2[5,8.10^{-16}]^4 =$
 $1,777591.10^{-61} \text{ m}^4$, Angular velocity $w_e = \frac{v}{r_N} = \frac{c}{1836} = \frac{3.10^8}{1836} = 1,633.10^5 \text{ m/s}$ because of
 masses analogy and **Electron-Nutation-frequency** $f_N = \frac{sQ}{2\pi J_3 w} = \frac{5,82.10^{-16} \cdot 8,93.10^{-30}}{2\pi 1,777591.10^{-61} \cdot 1,633.10^5} =$
 $f_N = f_R = 2,8398447.10^{10} \text{ s}^{-1} \dots\dots(23)$

The Quantum-Energy $E = h f_N = 6,62606957.10^{-34} \cdot 2,839844.10^{10} \text{ H} / 1,6022.10^{-19} \text{ eV} =$
 $= 1,17444789844.10^{-4} \text{ eV}$, is a small Quantity of Quantum-Energy.

Since this minimum frequency $f_N = f_R = 2,8398447.10^{10} \text{ s}^{-1}$ exists in all Atoms, *due to the Hydrogen first cave*, is the **Resonance-frequency** between **Atoms and Molecules** in Cosmos.
i.e. THE SPACE - { $r_{\min} = 1,07.10^{-7} \text{ m}$ } - **ENERGY** - { $f_m = 2,839844.10^{10} \text{ H}$ } IN

QUANTIZED-CAVE { $g \cdot r^3 \cdot f_R^2 = 1$ } OF SPACES { $[s + \bar{v} \nabla i]^{1/w} = e^{-i(\frac{\pi}{2} + 2k\pi) \cdot w}$
 $= e^{-i(\frac{5\pi}{2}) \cdot 10}$ }, CONSISTS the min. **QUANTUM-ENERGY** $\rightarrow E = 1,1745 \text{ eV}$.

7... For Energy-Cave equation $\rightarrow e^{-i(5\pi/2) \cdot 10}$ **Formatters min-cave** $\rightarrow r = 1,07.10^{-7} \text{ m}$

which in turn by the **Unit-Energy Orbit-Surface-U-Planck-relation**, $g = 1 \approx g$, and from,

8... Unit-Energy-Mould $g \cdot r^3 \cdot f_R^2 = 1$ or $f_R^2 = \frac{1}{r^3}$ **creates** the minimum frequencies, **Energies**,
 $f_R = 2,8398447.10^{10} \text{ H}$, between, $1,330265.10^{10} \text{ H}$ and $4,1701097.10^{10} \text{ H}$, in caves and
 the in Electron-Cave which is **The Nutation-Unit-Frequency** and becomes the minimum
Quantum-Frequency again, in above r , cave and which is following,

a... Frequency $f_N = f_R = g [\frac{s \cdot m_e}{2\pi J_3 w}]$ which passes through atoms structure and as **Energy-Spring**
in Magnetic-field, Strengthened and manifested, as **The Images in MRI**.

This Property of Electron-Nutation is Probably very Interested in Medicine, MRI and in
 many other Media as **Mobiles** and Others, because of $\rightarrow \langle r_{\min} | \cup \cup | f_m \rangle \leftrightarrow [f_N] \leftarrow$
 It is proved in [86] that this Energy-Spring of Electron-Nutation creates the Energy-Bonds
 in Atoms so that these bond to Originate-Molecules.

b... The Article, New Electromagnetic-Structure of Atom [90] contains,

1. The **Unit-Quantization** of Planet-Focus line r , sweeping $r \cdot mv = k = \text{Constant-Area}$.

2. The **Unit-Cave-Energy Quantization** as Work and is $\rightarrow W = 4\pi^2 \cdot r^3 \cdot f_p^2 = 1$

3. The **Resonance Unit-Cave-Frequency** $f = \sqrt[4]{\frac{1}{4\pi^2 m \cdot r^3}}$ of Masses $\frac{1}{M_T} = \frac{1}{m_p} + \frac{1}{m_n} + \frac{1}{m_e}$

4. Charges $Q_T = q_p + q_e$, from Lorentz force, $F = qE + qvB$, in Magnetic-Field $\bar{B}_F = \frac{2\pi M_T}{Q_T} |f|$

5. The Resonance Energy $E = \frac{1}{a^3} [\frac{4\pi^2}{c^2} + \frac{S^2}{2m}]$ or $E = \frac{\pi}{g r^2} [g^2 r + 2 \cdot S^2 \cdot f^2]$, in cave $a = \sqrt[3]{1/g f^2}$

c... Equation (f-8) which is extreme case, **Space-Energy**, for the **velocity in Hydrogen cave**
 or for Geometry and Mechanical interpretation either Separating each other or and Both.
 Energy-Constant k (f-7), regulates motions in caves as the constants in integrations.

d... For Hydrogen-Circular-radius $a = \sqrt[3]{\frac{1}{g \cdot f^2}} = 2,1127839.10^{-11} \text{ m}$, issues $E = hf_1 = 13,6 \text{ eV/h}$

and for $e = 0$ then $v^2 = [4\pi^2 \cdot k] \cdot \frac{1}{r}$, and constant $k = \frac{r \cdot v^2}{4\pi^2} = \frac{a \cdot v^2}{4\pi^2}$. The Constant k of

Electron-Nutation is measured as $\rightarrow k = \frac{2,1145016.10^{-11} (2,998.10^8)^2}{4\pi^2} = 4,81406.10^4 \text{ m}^3/\text{s}^2$

c.. For any Material-Point occupying only **Spin** $\equiv L$, then $\frac{k}{r} [1 + 2\pi^2 mk(1+e)] = 0$ or

$1 + 2\pi^2 mk(1+e) = 0$ and for **Electron** $k = -\frac{1}{2\pi^2 \cdot m(1+e)} = -\frac{1}{(1+e)} [6,9999 \cdot 10^{29}] \text{ N}$ and

Rotating-Energy due to **Electron-Spin** is $E = \frac{S^2}{2m r^3} = \frac{(5,691952.10^{-34})^2 \text{ Kg.s/m}}{2 \cdot 7,2373149.10^{-32} (2,3762992.10^{-16})^3} =$

$166,8059.10^9 \text{ J}$, which is an energy released by explosion of one Kiloton of TNT.

Rotating-Energy due to a **Black Hole-Spin** is $E = \frac{S^2}{2m r^3} = \frac{(1,152.10^{66})^2}{2 \cdot 1,6.10^{42} (2,4.10^{15})^3} = 2,604.10^{43} \text{ J}$

equal to the **Energy of an Electromagnetic gamma-ray-burst** $\rightarrow$ i.e. Energy-constant k , is

the Regulator of Energy as Force-equation, $k = \frac{r \cdot v^2}{4\pi^2} = \frac{(2,4.10^{15}) \cdot 9.10^{16}}{4\pi^2} = 5,47.10^{30} \text{ N} \rightarrow$

1-c... The Properties of the, Φ , Golden-Ratio-Pattern .

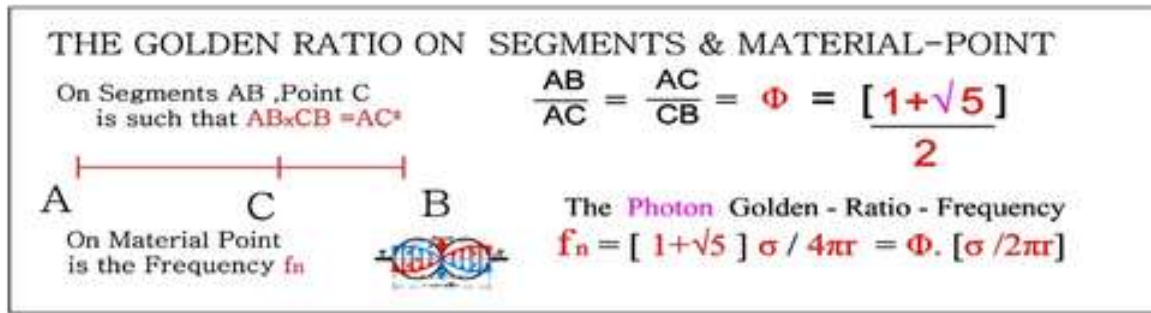


Figure – 2 - : The Physical explanation of **The Golden-Ratio Φ** in Universe :

In figure - 2 , AB Sector is divided by point C such that $AC = \frac{AB}{2} [\sqrt{5}+1]$ (1) The Proof :

According to the definition of Mean ratio exists , $AB / AC = AC / CB$, or $AC^2 = AB.CB$.

$$= AB.[AB-AC] = AC^2 = - AC.(AB) + AB^2 \rightarrow AC^2 + AC (AB) - AB^2 = 0 \quad \dots\dots(2)$$

Solving the second degree equation (2) then $AC = \frac{AB}{2} [\sqrt{5}+1]$, i.e. Point C on AB sector , is such issuing (1) .

The Physical meaning becomes from Mechanics where , when a force , P , acting on a surface

, S , of a differential volume ds^3 , then Principal stresses σ_1 , σ_2 , and Shear stresses τ_{12} are

$$\text{as equation } \sigma = \sqrt{(\sigma_1 - \sigma_2)^2 + 4 \tau_{12}^2} \quad , \text{ and } \sigma_{1,2} = (\sigma_1 + \sigma_2) / 2 \pm (\frac{1}{2}) \sqrt{(\sigma_1 - \sigma_2)^2 + 4 \tau_{12}^2} \quad ,$$

where $\rightarrow \tan \theta = 2. \tau_{12} / (\sigma_1 - \sigma_2) \dots (3)$

When the surface becomes a Point [**This is the Extreme case where surface is interchanged as line or and as line-segment** , it is the same as the infinite small , ds , in Calculus] , then $\sigma_2 = 0$ and τ_{12} is very small i.e.

It is a Type of vanishing-Shear due to layers laterally shifted . Since force **P** is a vector then as in cross-product to a right-handed coordinate system , where exists $\sigma_2 = 0$ and , $\tau_{12} = \sigma_1$, then equation (3) becomes ,

$$\rightarrow \sigma_{1,2} = \sigma_1 / 2 \pm (\frac{1}{2}) \cdot \sqrt{\sigma_1^2 + 4. \sigma_1^2} = \frac{\sigma_1}{2} \cdot [1 \pm (\sqrt{5})] = \frac{\sigma}{2} \cdot [1 \pm (\sqrt{5})] \quad \dots\dots (4)$$

Equation (4) denotes the way that Stresses $\sigma_{1,2}$ are shaped on any Volume according to the Principal Stress σ , and which **is the Golden-ratio** $\Phi = \frac{\sigma}{2} [1 \pm (\sqrt{5})]$ of Stress σ .

Since also **Stress σ** eternally exists in Material point and **is of the Golden-ratio-pattern Φ** , therefore microcosm and sequence all macrocosm follows , **the Stress σ , Property Vector** , of the $\rightarrow$ Growing-Golden-ratio-Pattern Φ as this is stated in ,

- 1.. Stress with Golden ratio Property ,
- 2.. Centripetal acceleration due to Stress ,
- 3.. Gravity = Stress = Centrifugal acceleration ,
- 4.. Gravitation constant G Stressing , g .

All above related vectors , of frequency f_n , occupying the **Growing - Golden-ratio** Pattern Φ , give the analogous Strength to **enter-caves** , and incidentally in satiation Systems to follow the **Split-Property as this happened to Organic-Chemistry**.

The Φ Properties :

To show that $\Phi = 1 + \frac{1}{\Phi} = 1, 6180339887$: Proof ,

$$\text{It is holding } \rightarrow 1 + \frac{1}{\Phi} = 1 + \frac{1}{[1+\sqrt{5}]/2} = 1 + \frac{2}{[1+\sqrt{5}]} = \frac{2[\sqrt{5}-1]}{[\sqrt{5}+1] \cdot [\sqrt{5}-1]} \quad \text{or ,}$$

$$1 + \frac{1}{\Phi} = 1 + \frac{2[\sqrt{5}-1]}{4} = 1 + \frac{[\sqrt{5}-1]}{2} = \frac{2+\sqrt{5}-1}{2} = \frac{[\sqrt{5}+1]}{2} = \Phi , \text{ therefore , } \Phi = 1 + \frac{1}{\Phi} \quad \dots\dots(5)$$

Equation ..(5) is a very Interesting Property of the Golden - Ratio because is such that , **it can be Defined in terms of itself** , i.e. An unit , 1 , is equal to a new , Φ , which defines **the Space** , and of $\frac{1}{\Phi}$, defining the Opposite which is **the Anti-Space** . Both Space and Anti-Space , as in Electromagnetic Waves , act Simultaneously , and which are the continuous fraction as , $\Phi = 1 + [\frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \dots}}}] \quad \dots\dots (6)$

Because number , Φ , multiplied with its Reciprocal number $\frac{1}{\Phi}$, is a process of Addition , and equal to unit 1 , so $\rightarrow$ **Space * Anti-Space $\equiv$ Monad** $\leftarrow$ or $\Phi * \frac{1}{\Phi} \equiv 1$, because $\Phi * \frac{1}{\Phi} = [1 + \frac{1}{\Phi}] \frac{1}{\Phi} = 1$, or $\frac{1}{\Phi} + \frac{1}{\Phi^2} = 1$, and $\Phi + 1 = \Phi^2$ or $\Phi^2 = \Phi + 1 \quad \dots\dots(7)$ Equation (7) is written $\Phi^2 - \Phi - 1 = 0$ and the roots of the second

degree equation is $\rightarrow x = +\frac{\Phi}{2} \pm \frac{[\sqrt{(\Phi^2+4\Phi^2)}]}{2} = \frac{[\sqrt{5+1}]}{2} \cdot \Phi = \Phi * \Phi$ i.e. Golden-Ratio Property is continuously increasing by its self, **a Self-Growing Property of frequency f_n of Material-point.**

Equation (7) is also a very Special property of the Golden ratio because, *according to Euclid*, A straight line AB is said to have been cut in Extreme and Mean ratio when as the whole line is to the greater segment AB / AC, so is the greater to the lesser AC / CB, **and according to Markos**,

Since **frequency in Material-Point becomes** from the Equilibrium of, **Two-Opposite-Rotational-Energies**

$[\pm]$, as relation $\rightarrow \bar{B} \bar{w} = L = \frac{1}{2} J_1 w_1^2 + \frac{1}{2} J_2 w_2^2 + \frac{1}{2} J_3 w_3^2$, or the Angular-momentum $B \equiv \pm$ Spin S as,

$$\bar{B} = \frac{J.w}{2} = \frac{\pi r^4}{4} [2\pi f] = \frac{\pi^2 r^4}{2} [f] \equiv [a \text{ Constant} * f] \equiv \frac{2L}{w} = \frac{2L}{2\pi f} = \left[\frac{L}{\pi}\right] \cdot \left[\frac{1}{f}\right] = \frac{4r.L}{(1+\sqrt{5})\sigma}, \text{ or}$$

$$\bar{B} = \frac{4r.L}{(1+\sqrt{5})\sigma} = \frac{2r.[L=hf]}{(1+\sqrt{5})\sigma} = \frac{hf}{2\pi f} = \left[\frac{h}{2\pi}\right] \equiv \text{SPIN}, \text{ where } L = hf = \text{Constant and the Frequency}$$

$$\text{related to } \Phi \text{ is } \rightarrow f_n = \left[\frac{2}{\pi^2 r^4}\right] \cdot \bar{B} \equiv \left[\frac{1+\sqrt{5}}{2}\right] \cdot \frac{\sigma}{2\pi r} \equiv \left[\frac{\Phi \sigma}{2\pi r}\right] \dots\dots(7a) \rightarrow$$

which **Incorporates the Property of the Golden-Ratio-Pattern Φ** , and equation (7-7a) defines that Material Point of frequency f_n , *when collide with another Material Point, or with another Particle or Particles* then Produces another monad as $\rightarrow 1 \equiv \text{A New Quaternion}$ $\leftarrow$ and the first continuous to be of the same Identity, **frequency f_n** , as before and from Euler's, *Rigid Body Dynamics* the Work W is

$$W = 2L = \bar{B} \cdot \bar{w} = J \cdot w^2 \equiv h \cdot f_n$$

From above is seen the How **Duality-Photon-Energy** is working. $E = \bar{c} \cdot \{ \left[\frac{f_n}{\Phi^2}\right] + f_n \}$ and from **Stress σ**

$$\rightarrow \sigma = \left[\frac{2\pi r}{\Phi^2}\right] \cdot f_n = \left[\frac{2\pi r}{\Phi^2}\right] \cdot \{ \left[\frac{f_n}{\Phi^2}\right] + f_n \} = \left[\frac{2\pi r}{\Phi^2}\right] \cdot \left[\frac{f_n}{\Phi^2}\right] + \left[\frac{2\pi r}{\Phi^2}\right] \cdot f_n \equiv \text{Storage} + \text{Information and it is The Way}$$

of Energy-Storage and Stress-Information in Nature. In **Quaternion** with Real and Imaginary Part, **Energy Acts only on the Resultant-Direction End-Points**, Carrying Energy from One-Edge to another

Edge, and unveils Cosmic-Particles-Origination as frequency $f_n = v/2\pi r = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\sigma \cdot \Phi}{2\pi r_n}$, i.e.

The Frequency of Photon, is embodied with the $\rightarrow$ Growing-Golden-ratio-Pattern Φ , and Uses the Vibrating Physical Structures, the Granular Material-Instruments, to Kick Start Energy on all of them and everything in this World. For more in [95]

2-c... The STPL -Pattern of Particles-Interactions and Forces-Exchanged :

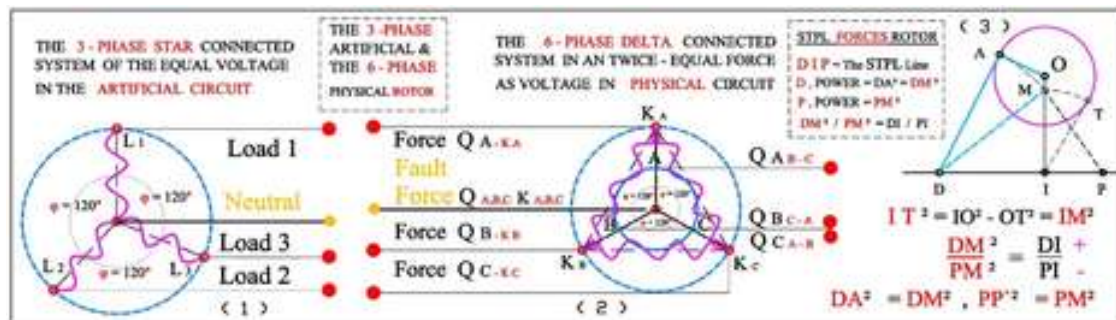


Figure – 3 - : The Physical explanation of The Cosmic-Particles and Forces in Universe :

In figure -3-Right - , $[O, OA]$ is the Common-Circle, DP the STPL line, DA to the circle, OI is Perpendicular to DP line, $IT = IM$ is the tangent to the circle and, P , is any other Point on STPL line. To show 1) $DM = DA$, 2) $PM = PM'$, where PM' is the tangent from P .

Proof : From the right-angled-triangle DAO , and Pythagoras theorem then $DA^2 = OD^2 - OA^2$,

From the right-angled-triangles IMD , IOD and from Pythagoras theorem on DMP Triangle then,

$$DM^2 = DI^2 + MI^2 \text{ and issues } DO^2 = DI^2 + OI^2, \text{ or } \rightarrow$$

$$DO^2 = DM^2 - MI^2 + OI^2 = DM^2 + [OI^2 - MI^2] = DM^2 + [OI^2 - IT^2] = DM^2 + OT^2 \text{ i.e.}$$

$$DM^2 = DO^2 - OT^2 = DO^2 - OA^2 = DA^2, \text{ or } DM = DA, \text{ meaning that the Tangent } DA$$

of any Point **D or P** on STPL is always equal to the segment **DM or PM**.

For Point P issues $PM = PM'$, where angle $\angle PM'O = 90^\circ$

Remarks :

1.. The Tangent DA from Point P denotes the, Power of Point D to circle $[O, OA = OT]$, or $p_D^D = DA^2 = MD^2$, and $p_O^P = MP^2 = PM'^2$ (1)

2.. On triangle DMP where MI is the height, issues Pythagoras relation $\frac{MD^2}{MP^2} = \frac{DI}{PI} = \frac{p_D^D}{p_O^P} \dots(2)$

Meaning that the Ratio of the Powers of Any-Two Points on STPL is expressed **Linearly**

as their **Distance** from the foot-Point I as, $\frac{p_D^D}{p_O^P} = \frac{DI}{PI} = \frac{+DI}{-PI}$ i.e. a Standing-Wave.

3.. Considering the Power of Any- Point be the Charge of the Point then the **Charge of Point D** is $\rightarrow$ Charge $D = + \overline{DI}$, and **Charge of Point P** is $\rightarrow$ Charge $P = - \overline{PI}$ i.e.

The Physical Interpretation of Point-Charge is the Positive-Linear-Vector, $+ \overline{DI}$, and the

Negative-Linear-Vector, $-\vec{p}_1$, which are the Interactions from the two Points in loop DP.

- 4.. In Material-Geometry the $[\oplus]$ Charge Attacks $[\ominus]$ Charge and are created the Interactions between Forces, and because Desargues **D**, Pascal **P**, Points occupy a different Voltage, therefore **D**, **P** Points **Exchange Forces in the Range of Standing-Wave DP**. It is proved that Charges $[\oplus] \leftarrow a \rightarrow [\ominus]$ exist in Standing-Wave as the Four-Forces of SM.

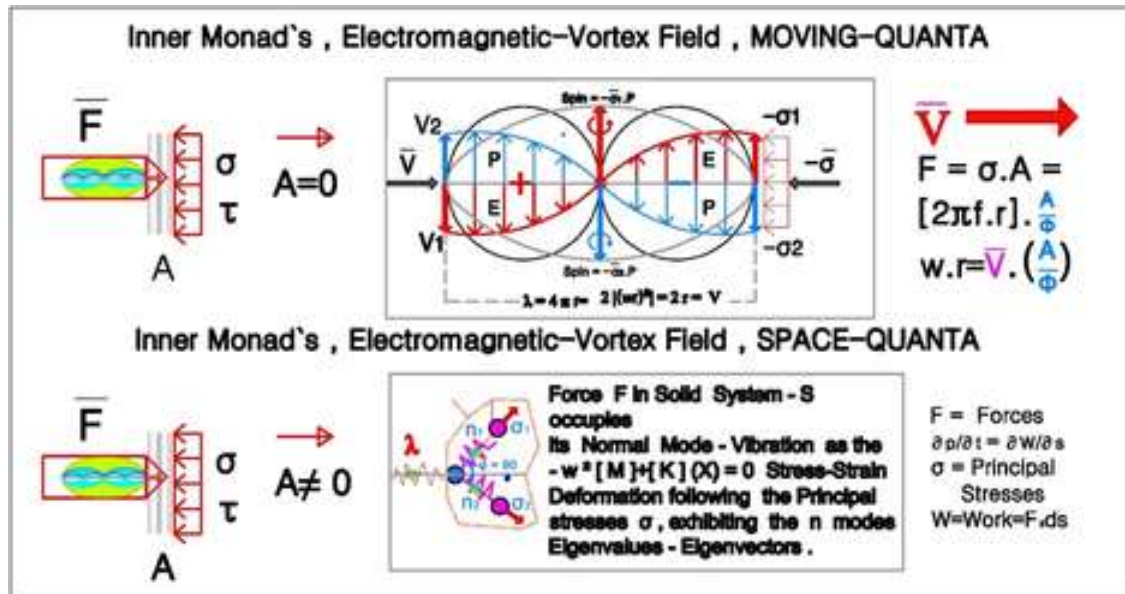


Figure -4: The Energy-Space, Stress-Strain in wavelength $\lambda = 2\pi r$, of a moving Photon :

3-c... The Forces, Stresses, velocities and Spin Relations :

- For area $A = 0$, the acting Force **F** which is an Energy-Space-cave, is manifested into the Transverse Principal stresses, σ , τ , and then as **an Moving-Storage** (1)-(2) is transported as Velocity-Vector $\vec{v}$. The force $F = \sigma.A \rightarrow \vec{p}$ vector $= M.\vec{v} = (m\lambda).\vec{v} = [mc.T].\vec{v} = [mc/f].\vec{v} = [m/f].c.\vec{v}$, i.e. **Force F $\rightarrow$ becomes a Velocity-Vector $\vec{v}$ or, a Force as Stress σ , which enters in Space Φ as $[\sigma\Phi]$ and becomes the frequency $\bar{f} = \frac{\sigma.\Phi.r}{2\pi.r_n}$, existing as the Force $F = \sigma.A = [\frac{2\pi r f}{\Phi}].A = w.r.[\frac{A}{\Phi}] = \bar{v}[\frac{A}{\Phi}]$, which Force, F, becomes the moving Storage $[\frac{A}{\Phi}]$, and velocity $\bar{v} = [\frac{F.\Phi}{A}] = F.[\frac{\Phi}{A}]$.**
- For area $A > 0$, Force **F** which is an Energy-Space-cave, diffuses as Electromagnetic Radiation in the Principal stresses $\pm \sigma_1, \pm \sigma_2, \pm \sigma_3$, which is **The Passage** through which Forces travel in moving Solids. From the theory of Elasticity the equilibrium of a surface - Configuration in an Isotropic material obey the equilibrium equation $\rightarrow \mu.\nabla^2 u + (\lambda + \mu).\nabla.[\nabla.u] = 0 \leftarrow [26]$
- For area $A < 0$, because Force **F** is an Energy-Space-Cave which at first Passes from the Zero area $A = 0$ and becomes velocity-vector $\vec{v}$, this velocity-vector $\vec{v}$ is entering any trough, Potential, and transformed to an Energy-Rim, as these are the Orbits of Electrons. Because Photon is one of the moving-energy-stores, when it enters a cave $L_s < L_p$, then the cave becomes a Discrete Energy-Packet which is the Rim L_v .
- For area $0 < A < 0$, **The Extreme case, where Surface is interchanged as line or as line-Segment, and is the same as the infinite small, ds, in Calculus**, where stresses $\sigma_2 = 0$ and τ_{12} are very small, **it is the equation of Stresses $\sigma_{1,2}$** , and from Cauchy $\sigma_1/2 = \pm(\frac{1}{2}).\sqrt{\sigma_1^2 + 4.\sigma_1^2} = \sigma_1.[1 \pm (\sqrt{5})]/2$, which is the **Golden-ratio-Pattern Φ** , of the Material-Point as a Type of a vanishing-Shear due to layers laterally shifted. [26]

This minimum quantized energy σ , was proved that is going out the Material Point as acceleration and creates the Stationary-gravity **g** as frequency, f_n , acting on Spin as **$S_{PA}.r^4$** . **The Proof**

Centripetal Force $F_c = mv^2/r = 1.(wr)^2/r = w^2.r = \pm \sigma = (2\pi.f_1)^2.r = \sigma_1.[1 \pm (\sqrt{5})]/2$ and $w^1 = f_n = \frac{[(1+\sqrt{5})\sigma]}{4\pi r}$.

From Kinetic energy $E = \frac{mv^2}{2} = \frac{1.w^2.r^2}{2} = hf$, then $w^2 = \frac{2E}{r^2}$ and $E = \frac{[(1+\sqrt{5})\sigma]^2}{2}$, $f_n = \frac{[(1+\sqrt{5})\sigma]}{4\pi r}$, and

$2.\vec{B} = \pi^3\Phi\sigma$, where then **frequency-force f_n** , orients **Spin $\vec{S}$** to **$\vec{B}$** as,
 $\rightarrow \vec{g} = f_n \times \vec{B} = [f_n \times \vec{B}].\sin \theta = \frac{[(1+\sqrt{5})\sigma]}{4\pi r} \pi^3\Phi\sigma.1 = \frac{[\sigma^2 r^2 (1+\sqrt{5})\Phi]}{8} = [\frac{\sigma.r.\Phi}{2}]^2 \dots (g)$

Equation (g) which is Gravity constant **g**, is the Permeable Path for inner stress σ , to **pass the Material's-Point** a surface $4\pi^3/3$ and to **expenditure its Energy**. The same exists also to the **Electromagnetic force** which is **associated with a fundamental Property** of matter which is the **Electric-Charge** and which is **a clue to The ubiquity of Electromagnetism**.

From equation of Gravitation , $G = k_E g = g \cdot [k_R g_R]$, seems that the two constants are related , i.e. **act each other through Local-coefficients or through Field-lines** , called the Medium or Permissible Path which is as the Stress relation $\sigma = \frac{F}{A} = \frac{2\pi r f}{\Phi} = \frac{w r}{\Phi} = \frac{v}{\Phi} = \frac{G}{\Phi^3}$, a velocity vector in an Unit-Space Φ .

It was shown that the first Path is Gravity g and Original Field-lines of Force , G , are distorted by these *Charges , Local-coefficients , the Layers* following the Newton's laws .

The Original Field-lines terminate at the surface on one side of the Medium , and new field lines originate from the other side of it . It was shown that the Momentum vector $\vec{B}$, is equal to spin S , *because it is following the Stationary - Wave - Nodes - Principle in the Material-Point* , creates the minimum quantized Energy which is conserved in lobes . This Property is extended also to the Number of lobes as well as to , π , number as velocity $\{ v = n \cdot \pi \cdot c \}$ which is the minimum Number relating Lines and Surfaces .

Analogous happens in equation (c) when $v = c$, and $\rightarrow r = c$.

From Inner-velocity equation $v = w \cdot r = (2\pi / T) \cdot r = 2\pi \cdot f_1 \cdot r$, of fundamental frequency f_1 , of wavelength $\lambda = c \cdot T = c / f_1$, and cave $r = n \cdot [\lambda/2]$, then $r = n \cdot (c / 2f_1)$ and $v = 2\pi \cdot f_1 \cdot [n \cdot c / 2f_1] = n \cdot \pi \cdot c$ or $v = n \cdot \pi \cdot c$ (π)

Equation (π) shows that velocities in lobes are , $n \cdot \pi$ times that of light , following , π , number in circle , i.e. **in Material-Points** exist **velocities multi-times that of light** and the minimum **Surface-constant , Unit π** , or the **Growth of the velocity-vectors** occurs in lobes by following the logarithm laws of Energy-constant c , which is acting on Space constant π . From velocity , $v = n \cdot \pi \cdot c$, is seen that **light-velocity is the Quantum of Unit-velocity in Planck's length** . The Why velocity c and π , is such in [42-51-63] and now later.

Kepler's Laws $\rightarrow$ Explain **How** the Planets move around the Sun But **NOT the WHY** .

Newton's Laws $\rightarrow$ Explain the **WHY** by filling this Gap by a Force $F = G \cdot m_1 \cdot m_2 / r^2$. acting instantly between the bodies that are moving around each other But NOT their Nature and NOT the HOW Force is Acting .

Markos-Spaces $\rightarrow$ Explain the WHY by filling the Gap with a **Double-Ocean of the Pointy-Spinning Material-Points** , *becoming from the Stationary - Material-Points , Photons or Electrons* , and from the **moving-Energy-Storages , the Duality-Photons** , $\vec{v} \cdot [\vec{f}_n + f_n] \equiv |\frac{v}{\pi^2 \cdot r_n^4}| \cdot |\vec{B}_n| + |\vec{c}| \cdot f_n$, of the two frequencies which Orientate and Re-orientate the Stationary-Spins and explain the HOW and the WHY all motions follow the **ubiquity of the Electromagnetism** , starting from the Primary-Material-Points , the **Photons** , which through the **Golden-Ratio-frequency-Growth** effect and conserve the Whole of this Natural-World from microcosm to macrocosm .

The Recent Annex relating the Greatest-Pressure-Level denotes the Pressure in the filling-Gap of Space-Energy reality . It has been done an effort of the Cosmic-Particles-Origination .

5.. The Four Forces : In an Material-Point the $[\oplus]$ constituent **Attacks the** $[\ominus]$ and from a different

Voltage as the **Forces** $\equiv \Sigma_-^+ = + - , \Sigma_+^+ = + + , \Sigma_-^- = - - , \Sigma_+^{++} = + + , \Sigma_-^{--} = - - -$

and this is happening in the **Standing-Wave-caves** and in **Travelling-Wave-caves** , as is **motion** . From above equations is seen that , since Particles are **Waves in the Range of Standing - Wave DP** in the STPL line , therefore occupy the Energy-Storages either Are Moving or , Not-Moving .

D.. THE PHOTONS :

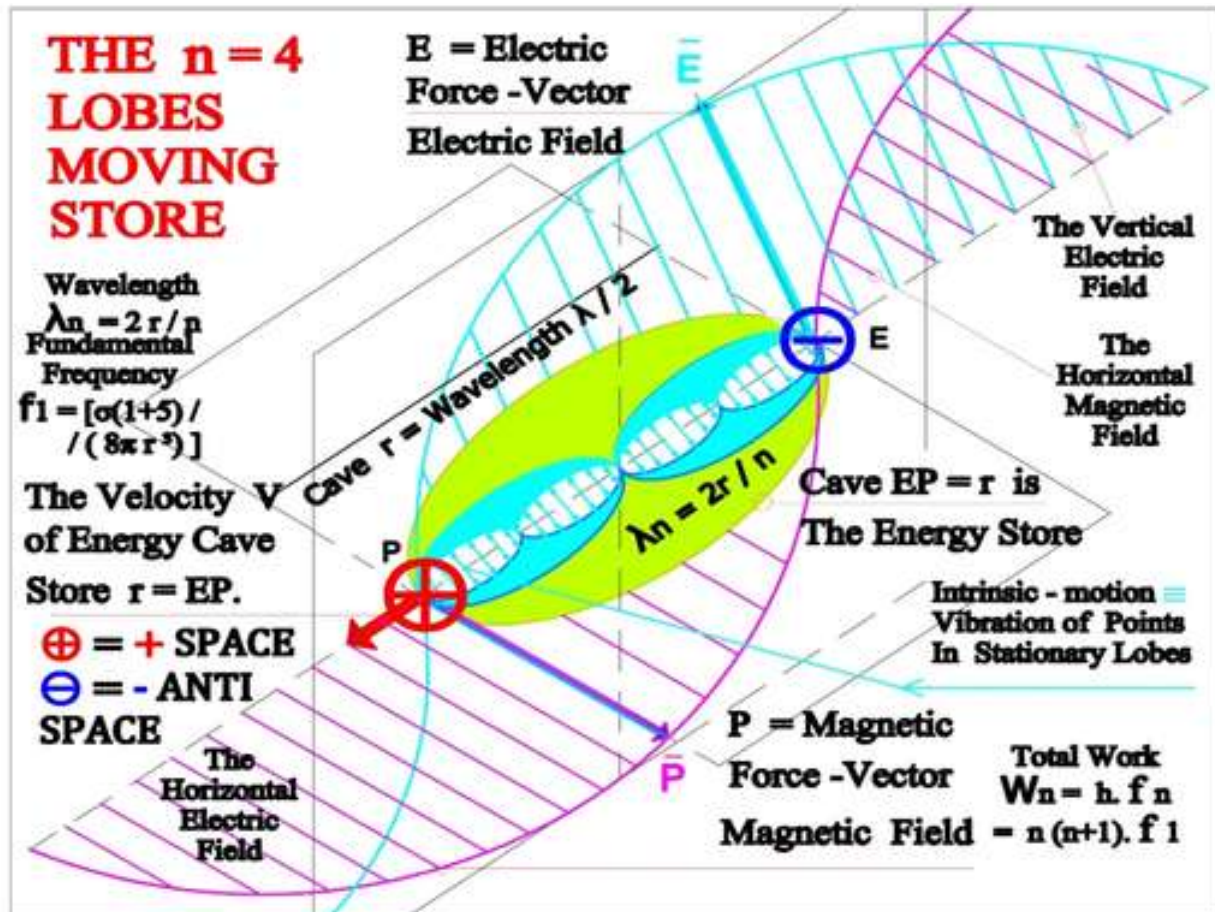


Figure - 5 - : The Propagation of Photon-Electromagnetic-Field-Storage EP :

In figure $r = \lambda/2 = EP$ is the *Energy-Storage-monad* [$S \equiv EM-R \equiv f_{1=N}, f_2, f_3, f_D, f_n = w^2$]

Propagating with $\vec{v} = \lambda_n \cdot f_n = \vec{c} \cdot [\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}] = \frac{\vec{c} \cdot \sigma}{2\pi r} + \frac{\vec{c} \cdot \sigma\Phi}{2\pi r} = \{ \vec{c} \cdot [\vec{f}_n] + \vec{c} \cdot f_n \}$, where the Natural

frequency $f_p = \frac{\vec{c} \cdot \sigma}{2\pi r} = \frac{\sigma^2\Phi}{2\pi r} = f \cdot \Phi = \frac{2n \cdot B}{\pi^2 r^4} = \frac{\sigma\Phi^2}{2\pi r}$, as Wave, and the velocity $\vec{v} = w \cdot r$, following the *Breakage-Principle* which is the Quaternion $\vec{z} = [s + \vec{v} \cdot \nabla i]$ or $\rightarrow s^2 - |\vec{s}|^2 + 2|\vec{s}|^2 \cdot \nabla i \leftarrow \equiv$

$[\epsilon E^2 + \mu B^2] \equiv$ The Energy-monad, EP, and as a Particle, $f_p = \frac{\vec{c} \cdot \sigma\Phi}{2\pi r} = \frac{\sigma\Phi^3}{2\pi r} \equiv \frac{2 \cdot B}{\pi^2 r^4}$

Matter (+) $\equiv$ Magnetic-field $\rightarrow [\mu B^2] \equiv$ The Storage-Basket
Antimatter (-) $\equiv$ Electric-field $\rightarrow [\epsilon E^2] \equiv$ The Moving-Basket

Energy (+ ↔ -) $\equiv$ Motion in n lobes $\rightarrow$ as $[\partial E / \partial t, \partial H / \partial t]$ i.e.

The Stationary-Cave-lobes, consist the *Particle-Photon* as the Inner motion, in the wavelength λ of cave, $r = n [\lambda/2]$ as the Energy-Storage, and the Wave $[E^2 + H^2] = 2 \cdot (2r) \cdot c \cdot \sin 2[\varphi \equiv \frac{B}{\Phi}]$, the Wave-Photon.

The *Energy-Storage-monads* are consisted of the above *Three-constituents* all-together, Or each-one of them.

The Work ratio is $\rightarrow W_n / W_1 = f_n / f_1 = n(n+1) \cdot [v_n / v_1] = n(n+1) \frac{\lambda_n f_n}{\lambda_1 f_1} = n(n+1) \frac{n \lambda_n f_1}{2r \cdot f_1}$

$= n^2(n+1) \frac{\lambda_n}{2r} = n(n+1)$, and for $\lambda_n = 2r$, then $v_n = v_1$, and then $\rightarrow n \cdot \lambda_n = 2r \leftarrow$
or

The Work, W , Produced from the *Wave-Energy-Pattern*, with wavelengths λ_n , and Created from all Points of the Periodic Oscillation in any Cave, r , is Stored into the, n , Integer and Energy - Lobes of this cave r , where wavelength amplitude is $E^2 + H^2 = B^2$. The Dual-Photon is $\rightarrow \{ \vec{c} \cdot [\vec{f}_n] + \vec{c} \cdot f_n \} \leftarrow$

From Mechanics, the *Only - Possible motions* are, the *Periodic-Excitations*, and the *Revolving-Motions* therefore all *Moving-Energy-Stores* Travel as a Wave and Not as a Particle. The n , Energy-Tanks

, are the N Antinodes in its moving Store $2\lambda = r = h/p \equiv [f_1, f_2, f_n = w^2 \equiv n \text{ lobes}]$, with (+), (-) Placed at the two

Sequent nodes and follow the *Stationary-Wave-Nodes-Principle*, i.e.

The Glue-Bond-Stress Rotation of Opposites on the Small-circles , creates , n , Integer numbers of lobes which is the Wave-Nodes-Principle of the moving-Energy-Stores ,one of which is that of Photon. The {n} **Energy - Storages** of The Moving – Monads in Figure -5-

In Electromagnetic field , EM-field , **Magnetic-field is the Storage in which $\rightarrow$ Energy $\equiv$ motion $\leftarrow$ is Stored , and the Electric-field is the Force , That Energy giving motion , which Pushes the [Energy-Store - Basket $\equiv$ The Magnetic-field] , executing The **Helicoid motion** .**

In Store , r , Wavelength $\lambda_n = \frac{2r}{n}$, Fundamental-frequency $f_1 = [\frac{\sigma(1+\sqrt{5})}{4\pi r}]$, and Work $= h.f_1$

The Energy-Storage length E-P $= \lambda/2$, is composed of 4 Lobes with wavelength $\lambda_4 = \frac{2r}{4}$,

$f_4 = \frac{4v}{2r} = 4f_0$, and $W_4 = \frac{h}{2r} v_4$, and for $\rightarrow$ The Loop-Total-Work , $W = [\frac{4\pi r^2 f_1}{3}] . n . (n+1)$, Or

$W = \frac{80.\pi r^2 f_1}{3}$, and from Dual-Photon $\rightarrow \{ \bar{c} . \bar{f}_n + \bar{c} . f_n \} \leftarrow v_4 = \lambda_4 . f_4 = 4 . \lambda_4 . f_0$, therefore for ,

$n = 1 \rightarrow f_1 = 1 . [\frac{\sigma(1+\sqrt{5})}{4\pi r}]$, Wavelength $\lambda_1 = \frac{2r}{1}$, Energy $W_1 = [\frac{4\pi r^2}{3}] . f_1 = 1 . \frac{(1+\sqrt{5})\sigma r}{3} =$

$n = 2 \rightarrow f_2 = 2 . [\frac{\sigma(1+\sqrt{5})}{4\pi r}]$, Wavelength $\lambda_2 = \frac{2r}{2}$, Energy $W_2 = [\frac{4\pi r^2}{3}] . f_2 = 2 . \frac{(1+\sqrt{5})\sigma r}{3}$

$n = 3 \rightarrow f_3 = 3 . [\frac{\sigma(1+\sqrt{5})}{4\pi r}]$, Wavelength $\lambda_3 = \frac{2r}{3}$, Energy $W_3 = [\frac{4\pi r^2}{3}] . f_3 = 3 . \frac{(1+\sqrt{5})\sigma r}{3}$

$n = 4 \rightarrow f_4 = 4 . [\frac{\sigma(1+\sqrt{5})}{4\pi r}]$, Wavelength $\lambda_4 = \frac{2r}{4}$, Energy $W_4 = [\frac{4\pi r^2}{3}] . f_4 = 4 . \frac{(1+\sqrt{5})\sigma r}{3}$

i.e. In store , r , can exist n , frequencies as $f_n = n . f_0$, n , times the fundamental frequency .

Electromagnetic waves are created by the vibration of an Electric-charge . In Material – Point , The eternal rotation of the $\oplus$ constituent around the $\ominus$ constituent creates the , n Energy-lobes in a Tank $r = n \frac{\lambda}{2}$ or wavelength $\lambda = \frac{2r}{n}$, since the velocity of the wave is $\bar{v} = \lambda / T = \lambda \times f$. The frequency is $f = \frac{n.c}{2\pi.r}$ where n

is a positive and integer number . In Storage-lobes of the Photon-Particles are the [+] , [-] constituents of , Space and of Anti-space , and the maximum amplitude of each constituent is related with its Position and each Amplitude oscillates Periodically as the **wave equation** , $x = v_0 . \sin wt = A . \sin [\sqrt{(a/Am)} . t + \pi/2]$ (1)

where **a..** Velocity $\rightarrow |\bar{v}| = w r = \frac{2\pi}{T} . r = 2\pi r f$, and $f_n = \frac{n.v}{2\pi r} = \frac{n\sigma}{4\pi r} [1 + \sqrt{5}] = \frac{n.\sigma\Phi}{2\pi r} = \frac{B}{\pi^2 r^4} \rightarrow$ Particle

b.. Angular velocity $\rightarrow |\bar{w}| = \frac{\sigma}{2r} [1 + \sqrt{5}] = \frac{\sigma\Phi}{r}$, and **Fundamental frequency** $f = \frac{(1+\sqrt{5}).\sigma}{4\pi r} \rightarrow$ Wave

In cave , r . in where , Wave Propagates , as in a Magnetic-device the arced Pattern , by travelling from North to the South Pole , and thus creating the Inner - Electromagnetic-Displacement , the Current which is ,

$$\rightarrow \partial E / \partial t , \partial H / \partial t \leftarrow \text{and when reduced to one line as ,} \\ E \rightarrow \partial E / \partial t \rightarrow H \rightarrow \partial H / \partial t \rightarrow H , \quad E = H c$$

This vibration of opposites creates a Wave which has both an Electric , E , and an Magnetic component H , which

are Perpendicular and is $[E^2 + H^2] = 2.(2r).c.\sin 2\phi . [\phi \equiv \frac{\bar{B}}{\Phi}]$ (2) , on-where exists the **Skin-effect** . [68-70]

This happens because of the difference in density on **Stress-common-curve** , $\rho = \sigma$ instead – of density $\rho = 0$ as happens at the center of the circle . This Property in Material-point Launches ,

The Inner-Electromagnetic-Wave , Out of **The-Particle** $\equiv [E^2 + H^2] = 2(2r).c.\sin 2[\phi \equiv \frac{\bar{B}}{\Phi}]$, of wavelength λ , **Outward** λ , as **The Outer Electromagnetic-Wave** $\rightarrow \{ \text{The-Wave} \equiv [\epsilon E^2 + \mu B^2] = 2.\lambda c.\sin.2\phi \} \leftarrow$ and allows all

The **Energy-Wave-Storages** to Propagate any Distance in Vacuum without any dissipation .

This Inner-motion $\equiv$ Work W , from the Wave-Energy-Pattern with Wavelengths λ_n , is created from all $\pm$ Points of the Periodic Oscillation in any cave r , and is stored in the n lobes as motion .This motion is conserved

and is transported through vacuum at the speed of light c . Since the **Medium-Field- is the Material-Fragment**

→ $[\pm s^2] = [\text{MFMF}] \equiv \text{The Chaos, is the base for all motions so then it is, the Motion of Photons} :$

All motions create Work which is conserved. Motion presupposes the velocity vector $\bar{v}$, which when it is in motion collides with other velocity vectors, creating a Constant Work k . Motion may be **Linear or Rotational** for any displacement, r , in any Store $\equiv$ cave, so exists in Vectors the **Quantum-Constant-Work**

→ $k = \bar{v} \times \bar{v} \cdot \bar{r} = v^2 \cdot r$, and becomes from relation $n\lambda = 2r$, issuing $2r = n v / f$, and is $v = \lambda f$ or → $\bar{v} = \bar{c} = \lambda f$.

Constant-Work $k = v^2 \cdot r = (w r)^2 \cdot r = \left[\frac{2\pi}{T} r\right]^2 \cdot r = \frac{4\pi^2 r^2}{T^2} \cdot r = \frac{4\pi^2 r^3}{T^2} = 4\pi^2 \cdot \frac{r^3}{T^2} = 4\pi^2 \cdot r^3 \cdot f^2_p \rightarrow$ and it is the universal **Kepler Planetary-Laws in macrocosm and macrocosm**.

For Unit-Stress-Gravity g , as $k = E = \frac{T^2}{a^3} = g = \frac{1}{f^2 \cdot a^3}$ and for $a = r$ then $g \cdot r^3 \cdot f^2_p = 1$, which is the **Kepler second constant-Unit-law for Areas in equal times**.

i.e. Photon during Motion in [MFMF] Chaos collides with other Photons, by means of the Cross Product and Produces a Constant-Work, which is stored into the Only-Four-Energy and Geometrical-Shapes of the motion which are the Conic-Sections. The Interior motion is kept in its Wavelength-Storage $2r = n\lambda$

*and the Linear motion is continued by the Propagating Electromagnetic-Wave **Energy-Store-Conveyer**.*

The mechanism of **Energy-transport through a Medium** involves the **Absorption and the Reemission** of the wave-energy by the Atoms of the material. Since Quanta of Energy occupy a finite space $\lambda = 2r$, as motion, then an Electromagnetic wave impinging upon the Atoms of a material, its energy is absorbed by the atoms of the material, and since **Energy $\equiv$ motion** then occurs **Resonance**, and electrons within the atoms undergo vibrations. After a short period of vibrational-motion, the vibrating electrons, due to g effect on Spin S , create a

New Electromagnetic wave with the same frequency as the first one and motion is conserved without delay through the medium. **Nutation occurs** due to the g , above referred effect. Because Energy is related to wavelength λ , as equation $E = h f = h \cdot (c/\lambda)$, then once the energy of EM-wave is reemitted then it travels through a small region of space, **its Magnetic-field**, between atoms and once it reaches the next atom the EM-wave is absorbed and transformed into electron vibrations and then reemitted as an → Electromagnetic-Wave ←

The actual **Speed of an Electromagnetic-wave through a material-medium**, due to the Absorption and Reemission-process, is dependent upon the **Optical - density** of the medium, or when their atoms are closely packed upon their, **Material - density**, Impedance-Type

The Electric force F , originated in, **Energy-field E** , by any two charges q_1, q_2 and Spread in a Fixed distance, r , occupies velocity $\bar{v} = \bar{c}$ and is equal to distance $\bar{r}$. The Above vector is $\bar{v} = \bar{r} = \bar{c}$ and is used for the Pointy-caves, one of which is the Atom-Nucleus. [82] The Eternal-rotation $[\oplus \cup \cup \ominus]$ of the $\oplus$ constituent around the $\ominus$ constituent in M-Point and for Photon on a Cycloid, **Is The Creation**, OF → **Period** as,

$w = \frac{2\pi}{T} = \frac{g}{4r} = \frac{\sigma}{4r}$ and **Frequency $f_p = \frac{\sigma = [\sigma\Phi]}{2\pi r} = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\sigma \cdot \Phi}{2\pi r}$** , from Intrinsic **Angular-Momentum-Vector** relation $\bar{B} = \frac{2L}{w} = \frac{L}{\pi f} = \pi^2 r^4 \cdot f = \left[\frac{h}{2\pi}\right] = \text{SPIN} - S$, of Particles, From $\bar{v} = \frac{G \cdot \Phi}{A} = \sigma \cdot \Phi = \bar{c}$ the **Light-Velocity** and

From $a = \sqrt[3]{1/g f_R^2}$ **The-Hydrogen-cave**, and from $E_R = \frac{1}{a^3} \left[\frac{4\pi^2}{c^2} + \frac{S^2}{2m}\right]$ for the **Atoms-Molecules** . i.e.

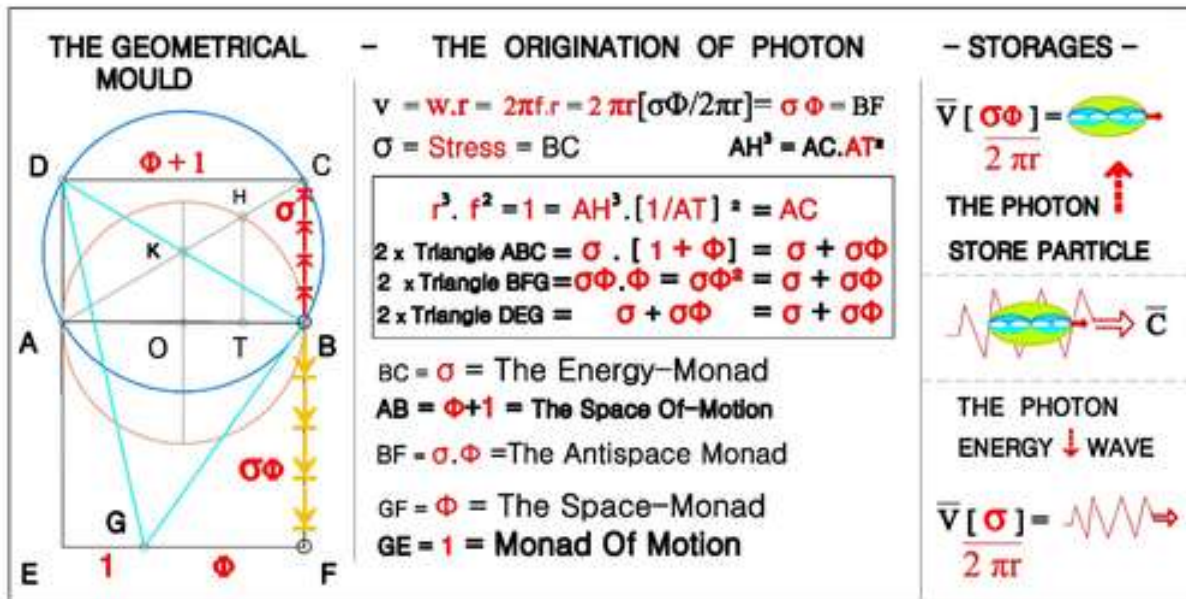
Photon is an **Energy-Spring-Store**, r , in a Stationary-wave of wavelength $n\lambda = 2r$, and is consisted of n Stationary lobes filled in λ with inner motion the Electromagnetic-Displacement current, while **Outward Propagates** with light-speed as an **Energy-Store** $[\bar{v} \cdot \bar{f}_n] \rightarrow \lambda = 2r / n$, and $[+]$ Electric-field as Space-motion and $[-]$ Magnetic-field as Anti-Space-Store $[\bar{v} \cdot \bar{f}_n]$. [70]

It was Proved That →

Physical-Quadrature $\equiv$ The Conversion of The -Moving-Energy-Square-Prism $\{|\bar{Q}_x \rightrightarrows |\bar{Q}_x \uparrow \uparrow |\overrightarrow{AK_A} \equiv \bar{E}_E\}$ on Conductor AK_A , Into An-Travelling-Equal-Energy-Sphere-Cone, $k \cdot \pi r^3$. OR $[\bar{E}_E \times \bar{E}_M \times \lambda] \equiv \bar{Q} \rightrightarrows k \cdot \pi r^3$

At Position K_A , becoming from The - Current-Phase-shift - $\phi = \pm 180^\circ$, and where issues → $\{\oplus AK_A \equiv \bar{Q}_x \rightrightarrows\}$ **i.e. The Electric-Current** $= \frac{\text{Charge}}{\text{Time}} = i = \frac{q}{T}$, Produced from Electromotive-Force $\bar{F}_E = \frac{[\oplus \rightarrow \ominus]}{r^2} = \overrightarrow{AK_A} = V = \frac{\bar{E}}{q}$, and Energy $E = q \cdot V$ is conserved in $\overrightarrow{AK_A}$ Conductor as Power $V i$. At Point K_A motion changes direction because its velocity-vector $\bar{v}$, changes direction to $\bar{v}$, and Phase-shift $\phi = \pm 180^\circ$. According to the Conservation Energy Principle, this Motion $|\oplus AK_A \leftrightarrow| \equiv |\oplus AK_A \uparrow|$ Is an Transverse constant-velocity motion $\bar{F}_E \rightarrow \equiv c \bar{F}_M$.

in Stationary $\overrightarrow{AK_A}$ Conductor . When the Stationary Conductor is the Wavelength λ , of an Propagating Wave then Square-Prism $\overrightarrow{F_E} \times \overrightarrow{F_M} \times \lambda = k \cdot \pi r^3$, becomes An Travelling-Energy-Sphere-Cone. For **Duality-Photon** issues $\{ \bar{c} \cdot \boxed{\bar{f}_n} + \bar{c} \cdot f_n \} \equiv$ Particle + Wave , where $\bar{c} \cdot \boxed{\bar{f}_n} = k \cdot \pi r^3 = \overrightarrow{F_E} \times \overrightarrow{F_M} \times \lambda$, and Equal-Intensities E_E , $E_M \perp E_E$.



1-d... The Duality Of Isochronous Photons .

Figure – 6 - : The Material-Geometry **Mechanism-of-motion** in Photons-Cave :

FROM MECHANICS **The Eternal-Rotation** of the Two Elements, $[\oplus \cup \ominus]$, Up or Down in Material Point circles, Originates the Spins, $\pm \frac{1}{2}$, ± 1 , $\mp \frac{1}{2}$, of All Particles, Fermions or Bosons, which combine from above Three-States just by Adding their Spins [36]. From Cauchy-Stress-Tensor under Plane-Stress conditions the **Equation of Principal-Stresses** $\sigma_{1,2}$, is $\sigma_{1,2} = \sigma_1 / 2 \pm (\frac{1}{2}) \cdot \sqrt{\sigma_1^2 + 4 \cdot \sigma_2^2} = \sigma_1 \cdot [1 \pm (\sqrt{5})] / 2 = \sigma \cdot \Phi$, which is the **Golden-ratio-Pattern** of the Material-Point as Type of a vanishing Shear due to layers laterally shifted. Equilibrium of, ABCD, ABFE, CDEF Quadrilaterals is through Ptolemy's and Ceba's E - relations, Fig-30.

This minimum quantized Energy σ , was proved that is going out the Material Point, *because of Skin effect*, as acceleration and creates the Stationary gravity g as f_n , acting on Spin as $S_{PA} \cdot r^4$. The Centripetal Force and equal to Stress σ , so $F_c = mv^2 / r = 1 \cdot (wr)^2 / r = w^2 \cdot r = \pm \sigma = (2\pi \cdot f_1)^2 \cdot r = \sigma_1 \cdot [1 \pm (\sqrt{5})] / 2 = \Phi \cdot \sigma$, and since mass is $m = \frac{\sigma}{w^2 \cdot r} = \frac{\sigma}{w \cdot c} = \frac{\bar{B}}{r \cdot c}$ then, $\pm \sigma = \frac{c \cdot \bar{B}}{r^2}$ which is a relation between Stress Momentum and light-velocity c .

It was shown in [70-P32] that in a Cycloid, the area between the curve and the straight line is $A = 3\pi r^2$ and the arc length $l = 8r$. For the motion on cycloid, we consider a Weight Q , at a 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 $AT = g \cdot \sin \varphi$ and since $\sin \varphi = \frac{s}{4r}$ and then $AT = g \cdot \frac{s}{4r}$.

Since acceleration $a = \frac{d^2s}{dt^2} = \frac{dv}{dt} = \frac{d}{dt}(\frac{ds}{dt}) = -g \cdot \frac{s}{4r}$ then $\frac{d^2s}{dt^2} = -g \cdot \frac{s}{4r}$ or $\{\ddot{s} = -w^2 \dot{s} \text{ where } w = \frac{2\pi}{T} = \frac{g}{4r}\} \dots (a)$ which (a) is a Harmonic Oscillatory motion showing that Acceleration is proportional to displacement and is directed towards the origin with a Period $T = \frac{2\pi}{w} = 2\pi \cdot \sqrt{\frac{4r}{g}} = 4\pi \cdot \sqrt{\frac{r}{g}}$, or and $w^2 = [\frac{g}{4r}]^2$, where $w = 2\pi f$.

Origination of Frequency, or **Period**, happens from above Property where $[\frac{g}{4r}] = 2\pi f$. In Material-Point

the Cycloidal-acceleration g_{cyc} is transformed as Centrifugal acceleration $g_{cyc} = \frac{(v)^2}{R} = \frac{g}{4r}$, where

r = the Radius of the Cycloidal-circle and R = the radius of curvature. In Cycloid velocity-vector $\bar{v} \equiv \bar{\sigma}$, and it is the Glue-Bond-Stress between the Opposites $\oplus, \ominus$ so velocity $\bar{v} = \bar{w} \cdot r = 2\pi \cdot \bar{f} \cdot r = \bar{\sigma} = \sigma \Phi$, the Frequency $\bar{f} = \frac{\bar{\sigma} = [\sigma\Phi]}{2\pi r}$ and the Total-Energy $2L = J \cdot w^2 = 4\pi^2 \cdot f^2$. The Circular frequency is

$$w^2 = \frac{(\sigma\Phi)^2}{r^2} = [2\pi f]^2, \text{ and the } \underline{\text{Frequency of Photon}} \quad f_p = \frac{|\sigma\Phi|}{2\pi r} = \frac{[1+\sqrt{5}]\sigma}{4\pi r} = \frac{\sigma\Phi}{2\pi r} \dots (a) \quad \text{i.e.}$$

Equation (a) 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. This Property belongs to Photon also, since it is a Material-Point. [70]

Since Total-Energy $L = B w = \frac{J.w}{2}$ $w = \frac{J.w^2}{2}$ then $2L = J.w^2$, and $\bar{B} = r.mv = r^{\frac{\pi.r^4}{2}} 2\pi f r = \pi^2.r^4.f$.

From momentum relation $\bar{B} = m r v = m r^2 w = m r^2 (2\pi f) = \frac{J.w}{2} = \left[\frac{\pi r^4}{2}\right].[2\pi f]$ then **Spin S** $\equiv$ **Angular-momentum** $\bar{B} \equiv \bar{S} = \frac{J.w}{2} = \frac{\pi r^4}{2} [2\pi f] = \pi^2.r^4.[f] \equiv \frac{[1+\sqrt{5}].\sigma.\pi.r^3}{4} = \frac{\pi r^3 \Phi \sigma}{2} \dots (b)$

Frequency of Photon is $f_n = \frac{[(1+\sqrt{5})\sigma]}{4\pi r} = \frac{\sigma\Phi}{2\pi r}$, where $\Phi = \frac{(1+\sqrt{5})}{2} = 1,6180339887$ and, $2r$

is The Diameter of Energy-Cave $AB = 2r$ of circle (O,OA) = Monad $\rightarrow \oplus \leftrightarrow \ominus \equiv 1 + \Phi$ and

$BC = |\sigma|$ = The **Glue-Bond-Vector** from the main-Stresses magnitude.

$ABCD$ = The **Energy-Space** Rectangular Parallelogram in Plane ABC.

$ABFE$ = The **Energy-Anti-Space** Rectangular Parallelogram in Plane ABC

$BF = |\Phi.\sigma|$ = **The Anti-Space-Vector**, and $FG = |\Phi|$ = The **Space-Vector** magnitude.

From Kepler 2nd Orbit laws the Unit-Quantized-Area, or Unit Quantized Energy is that per/sec $\rightarrow r d\phi$, following equation $1 = k.f_u^2 r^3$, and expresses the area of triangles.

In Figure (6), Triangle 2(ABC) = BC.BA = $\sigma.[\Phi+1] \equiv \sigma.\Phi + \sigma = [\text{Stress-In-Storage-}\Phi] + [\text{Moving-Stress}]$

Or **Storage S** $\equiv [\oplus \leftarrow r \equiv \Phi \rightarrow \ominus]$ + **Motion M** $\equiv [\bar{v} - \text{Vector}]$ and from Figure-4-

Triangle 2(BFG) = FB.FG = $\sigma.\Phi[\Phi] = \sigma.\Phi^2 = \sigma.[\Phi+1] \equiv \sigma.\Phi + \sigma \equiv S_{\text{storage}} + M_{\text{motion}}$

Triangle 2(DEG) = EG.ED = $\sigma + \sigma\Phi = \sigma.[1 + \Phi] \equiv \sigma.\Phi + \sigma \equiv S_{\text{storage}} + M_{\text{motion}}$, and since

Energy = motion / T $\equiv (\frac{v}{2\pi r}) . [\sigma + \sigma\Phi] = \bar{v} . [\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}] \equiv \bar{v} . [\frac{\bar{f}_n}{2\pi r} + f_n] \equiv$

Moving - Storage $\rightarrow [\bar{v} . \frac{\bar{f}_n}{2\pi r}] \leftarrow$ + Moving-Frequency $\rightarrow [\bar{v} . f_n] \leftarrow \equiv$ Material-Point i.e.

The Energy produced in Photon-Cave is consisted of **Two-moving-Storages**, that travel **as Wave** $[\bar{v}.f_n] \rightarrow [\bar{v} . \frac{\bar{f}_n}{2\pi r}] \rightarrow [\bar{v} = \bar{c} = \lambda_{\frac{f}{\Phi}}] \rightarrow [S \equiv EM-R \equiv f_{1=N}, f_2, f_3, f_D, f_n = w^2]$ and,

as Particle $\rightarrow [f_1 = (E^2 + H^2) = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\bar{B}}{\pi^2 r^4}] \rightarrow \{W \equiv EM-R \equiv [\epsilon E^2 + \mu B^2] = 2.\lambda c.\sin.2\phi\}$ and,

The Duality of an Energy-Storage $S \equiv \{ [\oplus \leftarrow r \rightarrow \ominus] + \text{Motion M} \equiv [\bar{v} - \text{Vector}] \}$,

Therefore $\rightarrow$ Photon is travelling Both as Particle and as Wave, as

1.. **Energy-Storage S** $\equiv [\oplus \leftarrow r \rightarrow \ominus] \equiv$ **Particle** $[\bar{v} . \frac{\bar{f}_n}{2\pi r}] \rightarrow [\bar{v} = \bar{c} = \lambda_{\frac{f}{\Phi}}] \rightarrow$ i.e.

a Stationary Standing - Wave $\rightarrow [S \equiv [EM-R \equiv f_{1=N}, f_2, f_3, f_D, f_n = w^2]]$.

2.. **Energy-Motion M** $\equiv [\bar{v} - \text{Vector}] \equiv$ **The Wave** $[\bar{v} . f_n] \equiv [f_1 = (E^2 + H^2) = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\bar{B}}{\pi^2 r^4}] \rightarrow$ i.e.

a Propagating Wave as $\rightarrow \{W \equiv EM-R \equiv [\epsilon E^2 + \mu B^2] = 2.\lambda c.\sin.2\phi[\phi = \frac{\bar{B}}{\Phi}]\} \leftarrow$

3.. **The Physical-Interpretation of the Dual-frequency f_{Photon}** :

Using the Material-Geometry-Vectors for the **Anti-Space Action** then,

From Force $G_{ON-AntiSpace} = \overline{AB} \times \overline{BF} \equiv [\Phi+1] \times \{|\sigma|. \Phi \equiv \sigma.\Phi\} = \Phi^2.\sigma\Phi = \sigma.\Phi^3$ or,

$G_{AN} \equiv \overline{AB} \times \overline{BC} \equiv \sigma.\Phi^3 \equiv [\bar{\sigma} - \text{Stress}] [\oplus \leftarrow \Phi \rightarrow \ominus] [\oplus \leftarrow \Phi \rightarrow \ominus] [\oplus \leftarrow \Phi \rightarrow \ominus]$

and $\rightarrow \rightarrow \rightarrow$ **Primary-Energy** $\equiv G.f_p \equiv h$ and OR $G^{-1} \times \sigma \times \Phi^3 \equiv 1 \leftarrow \leftarrow \leftarrow$ where

$G \equiv$ The Newton's-Universal Force = $6,680561.10^{-11} \text{ m}^3/\text{Ns}^2$

$\sigma \equiv$ The Glue-Bond-Stress in Material-Points $\sigma = \frac{2\pi r f}{\Phi} = 1,85.10^{-11} \text{ Kg/m}^2$ and, f ,

in Planck's length $r = L_p = e^{-i.(5\pi/2).10}$ is the Frequency $f_{\text{Plank}} = \frac{c}{2\pi r} = 2,95236210^{42} \text{ H}$,

in Planck's Length $L_p = e^{-i.(5\pi/2).10} = \{\sqrt{3}.\pi.1,616199.10^{-35} \text{ m}\}$

$\Phi \equiv$ The Golden-Ratio Pattern $\Phi = \frac{(1+\sqrt{5})}{2} = 1,6180339887$

From above relations is seen that, in Universe exists the only one Force $G \equiv \sigma.\Phi^3$, which is Acting on all **Quantized-Quantities as** $\rightarrow G \equiv \sigma.\Phi^3 \equiv \Phi^2.[\{\sigma.\Phi\} \equiv 2\pi f_p r \equiv w r \equiv \bar{v} \equiv m a = \bar{c}] \leftarrow$ and

From $\sigma \times \Phi^3 \equiv G \rightarrow [1,846462.10^{-11}].[3,618033989] = 6,680561.10^{-11} \text{ o.e.}\delta.(q.e.d)$

i.e. Universe is a Monad, Becoming from a **HUGE-MAGNET** of Opposites $\oplus, \ominus$ which Forms $\rightarrow$

The 3-Dimentional **SPACES Φ** , **ANTI-SPACES $|\Phi.\sigma|$** , and $\rightarrow$ Energy, where **ENERGY $\equiv$ MOTION** through the **G - Force**, and the Stress - σ - becoming from Photon.

i.e. **Ubiquity of Material-Geometry in Electromagnetism** is Everywhere.

Remarks on the Duality-Photon $\rightarrow \{\bar{c} . \frac{\bar{f}_n}{2\pi r} + \bar{c} . f_n\} \leftarrow \equiv \rightarrow$ Particle + Wave $\leftarrow$

a.. From equations $f = \frac{\sigma_1 \Phi}{2\pi r}$ and $\sigma_1 . [1 \pm (\sqrt{5})] / 2 = \sigma.\Phi$, then **Frequency f_p** , of Photon, is Independent of the Amplitude $[\epsilon E^2 + \mu B^2]$ of the Vibration, it is **Not-Damped and Not-Driven**, and so can be related to

Any-Force that can Produce Work $\equiv$ Energy as Wave and thus can be **Quantized to any Monad**.

- b.. **Photon** striking on an Object of Microcosm or Macrocosm then , **It is a Source** that **Gives** → **Energy** as Energy-Storage , $\boxed{\bar{f}_n}$, and **Information** as Propagating - Energy $\bar{f}_n$.
- c.. **Photon** in the Microcosm of Hydrogen-Cave can-Give such **Potential-Energy or Resonance-Energy** as **Frequency** $\bar{f}_R$ and Energy in [**Bracket-Orbit-Hook**] which Joins the **Atoms to Produce** the **Molecules**.
- d.. **Photon** striking on **Hydrogen-Cave** can Produce the **Resonance-Energy-Frequency** $\bar{f}_R$, such that can Produce **Photos** and **Image-Fringes** of Inter-Atom or any other Structures in Atoms .
- e.. **Photon** striking on **Cells** can Produce a **Resonance-Energy-Frequency** $\bar{f}_R$, such that can **Enter Cell** and **Break-It-Up** . Duality-Photon places $\boxed{\bar{f}_n}$ the Storages everywhere it stops and diffuses.

The **Kinetic-Energy** E_K of a moving Material - Point , as this is the *Photon* , is stored as motion in its Storage , $\mathbf{r} = [n \lambda/2]$ with the , $\mathbf{n}$ frequencies $\bar{f}_n = n \cdot \bar{f}_1$, with $\mathbf{n}$ lobes and fundamental frequency $\bar{f}_1$. From above is seen the **Passage and The - How EM-Radiation can travel in Crystals** and which are the Cauchy-Stress-Tensor where $E \perp B \perp r \equiv \sigma_1 \perp \sigma_2 \perp \sigma_3$, in-where Energy Propagates along Directions **without Birefringence** and carries , the motion $\equiv$ Energy Storage $\mathbf{r}$, which radiation is **The conveyer** . Above procedure can be used in Cells where cells are cases of a Birefringence material and the Resonance Passage happens as the Force of EM-Radiation in **Two directions** , **can travel in Cell** through **Cauchy Stress Tensor** where the Two Conveyers $E \perp B \perp r \equiv \sigma_1 \perp \sigma_2 \perp \sigma_3$, can carry the Energy-Storage , $\mathbf{r}$, in Cell . Interfacial Properties are detected from Surfactant , **and change the Inner-Structure of Cell to another desirable Property** . 15/3/2020 A wide Analysis in [84-86-90] .

2-d... The Origin of Stresses σ :

Gravitational-Constant-Force G , becomes as **Stress** $\equiv$ Force/Area $\equiv \mathbf{g}$, as equation

$$G = g k_E = g \cdot [g_E k_E] = \left[\frac{T^2 p}{a^3} \right] \cdot [g_L k_L] = \left[\frac{c \cdot r^3}{a^3} \right] \cdot [g_L k_L] = 9,8076925 \cdot 6,8116 \cdot 10^{-12} \equiv 6,68056 \cdot 10^{-11} \frac{m^3}{Ns^2} , \text{ and } \text{Effects on gravity} \rightarrow \mathbf{g} \equiv 9,8076925 \text{ Stress } \frac{Kg}{cm^2} \quad [73]$$

The Beyond-Planck-length Force $\mathbf{F} = \sigma \cdot \mathbf{A} =$ The Glue-Bond $\equiv$ Stress x Area $\equiv \left[\frac{2\pi f \cdot r}{\Phi} \right] \cdot A = w \cdot r \cdot \left[\frac{A}{\Phi} \right] = \bar{v} \left[\frac{A}{\Phi} \right]$ and becomes a moving Storage $\frac{A}{\Phi}$ travelling with velocity $\bar{v}$, $\mathbf{n}$ times that of light-velocity $\mathbf{c}$, as equation $\bar{v} = n \cdot \mathbf{c}$.

1... The Stresses in Beyond-Planck-Length :

Force is $\rightarrow F = \Phi^3 \cdot \boxed{[\oplus \sigma \ominus]}$ = $\sigma \times \Phi^3$ where , $\sigma \equiv \boxed{[\oplus \sigma \ominus]} \equiv$ **The Stress of Cave** as the **Quantized distance** $\mathbf{r} \rightarrow \boxed{[\oplus \leftarrow \mathbf{r} \rightarrow \ominus]}$ and $\Phi = \frac{(1+\sqrt{5})}{2}$ is the mould of Quantization , a kind of Impedance as occurs in Electricity , so from Material-Point frequency $\mathbf{f} = \frac{c}{2\pi r} = 2,93949410^{42}$ H , and $\sigma = \frac{c}{\Phi}$.

For the Planck length Stress $\sigma = \frac{2\pi r f}{(n)\Phi} = \frac{2\pi r f}{1 \cdot \Phi} = \frac{2\pi \cdot 1,616199 \cdot 10^{-35} \cdot 2,93949410^{42}}{1,6180339} = 1,84456315 \cdot 10^8 \text{ t/m2}$

$= 1,84456315 \cdot 10^{11} \text{ Kg/m2}$, and the Angular velocity , w , of Total-Planck Cave is ,

$$|w| = \frac{\sigma}{2r} [1 + \sqrt{5}] = \left(\frac{1,852816510^{11}}{2 \cdot 1,616199 \cdot 10^{-35}} \right) \cdot 1,6180339 = 9,274599 \cdot 10^{46} , \text{ rad/sec} , \text{ and then}$$

2.... The **Stress Outside Planck's-Length-cave** $\rightarrow \sigma_{Pl} = 1,84456315 \cdot 10^{11} \text{ Kg/m2}$, and

$$\mathbf{G} = \sigma \times \Phi^3 \equiv [1,84456315 \cdot 10^{11}] \cdot [3,6180339887] = \mathbf{6,673692 \cdot 10^{-11} \frac{m^3}{Ns^2}} , \text{ Nevertheless ,}$$

For Earth-System mass $M_E = 5,9723 \cdot 10^{24} \text{ Kg}$, and for Area $\rightarrow$ Radius 6378,137 Km

$$= 6,378 \cdot 10^6 \text{ m then Earth-constant } \mathbf{k_E} = \frac{[6,378 \cdot 10^6]^2}{5,9723 \cdot 10^{24}} = 6,811551810^{-12} \text{ and Gravitational}$$

$$\text{Force } \mathbf{G} = g \cdot k_E \equiv g \cdot [g_L k_L] \equiv \left[\frac{T^2 p}{a^3} \right] \cdot [g_L k_L] \equiv 9,80769 \cdot 6,8115518 \cdot 10^{-12} = \mathbf{6,68056 \cdot 10^{-11} \frac{m^3}{Ns^2}}$$

Remarks :

- a.. The Stresses become from a Force and a Surface as equation $\sigma = \frac{F}{A}$, and in the case of the Gravitational constant G and of cave , $\mathbf{r}$, then $\rightarrow \sigma = \frac{G}{4\pi r^2} = \frac{G}{\pi(2r)^2} = \frac{G}{\pi s^2}$, or vector $\mathbf{s} \equiv 2r$ as in Electromagnetic where $\lambda \equiv 2r \equiv \bar{F}_E \times \bar{F}_M$ where $\bar{F}_E \times \bar{F}_M \times \lambda = k \cdot \pi r^3$. Above relation means that Force G needs a Vector surface $\pi \cdot s^2$, to be spread as Stress σ , which is the case of Constant-light-velocity $\mathbf{c}$, as is the **first Surface** .
- b.. The case of a vector , $\mathbf{s}$, is the **Linear - Stress** while of an Plane is the **Surface - Stress** and consequently of a Volume is a , **Space - Stress** , as this was referred before for G Force , i.e. $G \equiv \sigma \cdot \Phi^3 \equiv \Phi^2 \cdot \left\{ \left[\frac{2B}{\pi r^3} \right] \right\} \equiv 2\pi f_p r \equiv w r \equiv \bar{v} \equiv m a \equiv m g = \bar{c} = \frac{2B}{\pi r^3}$]
- c.. Since Stresses follow equation $\sigma = \frac{F}{A} = \frac{2\pi r f}{\Phi}$, conclusively **Forces and Areas** are every where and are related to any-cave $\mathbf{r}$, through $\mathbf{f}$, which is the mean of **every-Information in Nature** .

3..d... The Origination of Light-velocity c , and Photon :

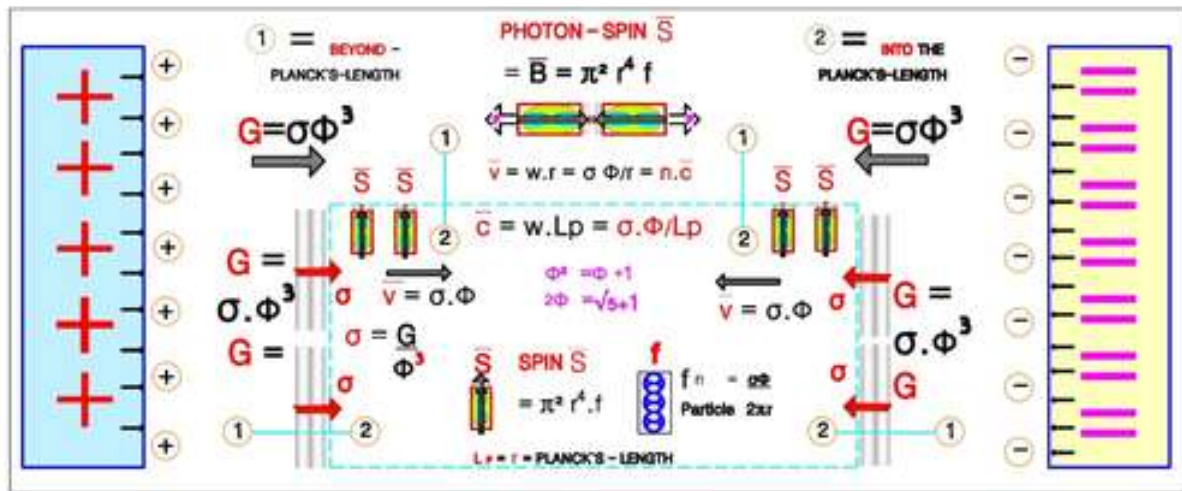


Figure – 7 - : The light-velocity-Mechanism in Material-Geometry and The Photons :

In (1). Is The Beyond-Planck's-length-Region where exists , The Gravitational-Constant G which is **the Force** G . The Photon is **Particle + Wave** $\equiv$ **An-moving-Energy** with light-velocity and its Duality is in frequency where $\bar{v} = \bar{c} . [\bar{f}_n + f_n]$. The Material-Points with velocities $n . \bar{c}$, are as $\bar{v}_m = n . \bar{c} \{ \bar{f}_n + f_n \}$, where $\bar{f}_n$ is

the Stationary-Storage and $[f_n]$ is the Propagating Electromagnetic - Radiation where $\bar{E} = \bar{B} . c$.

In (2).. Is the Planck's-length-Region in-where **Exist** $\rightarrow$ The Photon **Particle + Wave** $\equiv$ **Energy** , travelling with Light-velocity and the Duality in frequency as $\bar{v} = \bar{c} . [\bar{f}_n + f_n]$.

Primary- Particles Fermions and Bosons with their Spin $\bar{S}_F$, occupy according to their frequency f_F above velocity , That of Constant-Light-velocity $\bar{c} = \frac{G}{\Phi^3 L_p} \rightarrow$ or The Hydrogen Cave He , from $g . r^3 . f_p^2 = 1 \rightarrow$ The Electron-Charge and Electron from $4\pi^2 f_e^2 . m_e = k = \pi g$, and from Kepler's relation $4\pi . f_e^2 . m_e = g$.

The Proof :

It was shown That $\rightarrow$ **The Cycloidal-acceleration** g_{cycloid} is transformed as Centrifugal - acceleration and becomes the frequency of **Photon** as $f_p = \frac{\sigma = [\sigma \Phi]}{2\pi r} = \frac{\sigma . \Phi}{2\pi r}$, and Stress σ from $\rightarrow \sigma = \frac{F}{A} = \frac{2\pi r f}{\Phi} = \frac{w r}{\Phi} = \frac{v}{\Phi}$

a velocity vector in an Unit-Space Φ . becoming from Space $\oplus$ to Anti-Space $\ominus$ as $\sigma = \frac{2\pi r . f}{\Phi} = \frac{w r}{\Phi} = \bar{v} \dots (a)$

It was proved that **Photon-Travels** with velocity $\bar{v} . [\bar{f}_n + f_n]$, which is a Moving Stationary-Wave $\equiv$

as the Storage $\rightarrow [\bar{v} . \bar{f}_n] \leftarrow$ Plus a Propagating-Electromagnetic -Wave $\equiv$

as the Storage $\rightarrow [\bar{v} . f_n] \leftarrow$ which is an Material-Point i.e. From **Photon** $\rightarrow \{ \bar{c} . [\bar{f}_n + \bar{c} . f_n] \leftarrow$

The **Energy** Produced in **Photon - Cave** is consisted of **Two-Storages** , that are travelling ,

as Particle $[\bar{v} . \bar{f}_n] \rightarrow [\bar{v} = \bar{c} = \frac{f}{\Phi}] \rightarrow [S \equiv EM-R \equiv f_{1=N} , f_2 , f_3 , f_D , f_n = w^2]$ and ,

as Wave $[f_1 = (E^2 + H^2) = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\bar{B}}{\pi^2 r^4}] \rightarrow [W \equiv EM-R \equiv [\epsilon E^2 + \mu B^2] = 2 . \lambda c . \sin . 2\phi]$

and as Duality Is An **Stationary- Energy-Storage** $S \equiv \{ [\oplus \leftarrow r \rightarrow \ominus] + \text{Moving } M \equiv [\bar{v} - \text{Vector}] \}$

It was shown before that $\rightarrow$ **Energy** = motion / $T \equiv (\frac{v}{2\pi r}) . [\sigma + \sigma \Phi] = \text{velocity} =$

$\bar{v} . [\frac{\sigma}{2\pi r} + \frac{\sigma \Phi}{2\pi r}] \equiv \bar{v} . [\bar{f}_n + f_n]$, and consisted of the Two kinds of frequencies $\dots (b)$

From Force definition $\ll$ A Force F is a **Push or a Pull** acting upon an Object as a result of its interaction with another Object-Body $\gg$ and in Material-Geometry as

Push $\rightarrow \rightarrow [\oplus \leftarrow \text{Push} \rightarrow \oplus]$ and $[\ominus \leftarrow \text{Push} = \text{Force} \rightarrow \ominus] \equiv \text{Force}$
 Pull $\rightarrow \rightarrow [\oplus \rightarrow \text{Pull} \leftarrow \ominus]$ and $[\ominus \rightarrow \text{Pull} = \text{Force} \leftarrow \oplus] \equiv \text{Force}$

i.e. Both cases Push or Pull are Forces $\dots (c)$

It was shown That $\rightarrow$ **Force** F becomes a Velocity-Vector $\bar{v}$, as ,

Force = **Stress** x **Area** $\equiv \sigma \times A$ and from (1) $\rightarrow F = \sigma . A = [\frac{2\pi r f}{\Phi}] . A = w r . [\frac{A}{\Phi}] = \bar{v} [\frac{A}{\Phi}]$

and Because by definition **Angular-velocity** $w = 2\pi f$ and **velocity** $v = w r$. $\dots \dots \dots$ i.e.

Stress , σ , enters in **Monad-Space** Φ as $[\sigma \Phi]$, and **frequency** becomes $\bar{f} = \frac{\sigma . \Phi . r}{2\pi . r_n}$

and Force $F = \sigma . A = [\frac{2\pi r f}{\Phi}] . A = w r . [\frac{A}{\Phi}] = \bar{v} [\frac{A}{\Phi}]$, becomes the moving Storage $\{ \frac{A}{\Phi} \}$.

Newton's gravitational constant G is a Force directly proportional to the product of any two masses m_1, m_2 in macrocosm and inversely Proportional to the square of the distance between their centres, instead of the microcosms Coulomb's law of, two charges q_1, q_2 . From Mechanics, For area $0 < A < \infty$, **The Extreme case**, where **Surface is interchanged as line or as line-segment, and is the same as the infinite small, ds , in Calculus**, where stresses $\sigma_2 = 0$ and τ_{12} are very small, **it is the equation of stresses $\sigma_{1,2}$, or is $\sigma_1 / 2 = \pm (\frac{1}{2}) \cdot \sqrt{\sigma_1^2 + 4 \cdot \sigma_2^2} = \sigma_1 \cdot [1 \pm (\sqrt{5})] / 2 = \sigma \Phi$** , and is the **Golden-Ratio - Pattern** of the Material-Point as Type of a vanishing-Shear due to layers laterally shifted.

According to **Cauchy**, the stress σ , at any Point in an Object assumed as continuum and loaded by an external Force, F , is defined by nine stress-components as a second order Tensor, the Cauchy-Stress-Tensor and Force for the One Dimension extreme-case $F = \sigma \Phi$, while for the three -Dimension extreme-cases $F = \sigma \Phi^3$, and represents the **Equal Apportion** of the **External-Force** to the **Internal-Forces**.

According to Material-Geometry **Distance** $\equiv [\oplus \leftarrow r \rightarrow \ominus]$, and **Stress** $\equiv \Phi \cdot [\oplus \sigma \ominus]$ and for the three-Dimension extreme-cases $\Phi^3 \cdot [\oplus \sigma \ominus]$ is **Force** $F \equiv \Phi^3 \cdot [\oplus \sigma \ominus]$

i.e. **Forces Beyond-Planck-Length are** $\rightarrow F = \Phi^3 \cdot [\oplus \sigma \ominus] = \sigma \times \Phi^3 \leftarrow \dots$ (d)

Force $G \rightarrow$ on Spinning M-Points $\bar{S}$ through $\bar{g} \rightarrow$ and Planck's momentum $\bar{B} \rightarrow$ on $\mathbf{g}_G$ through $\mathbf{f}_R$ $G = \sigma \Phi^3$, and Stress $\sigma = \frac{G}{\Phi^3} = \frac{G \cdot \sigma^3}{c^3}$, or $\rightarrow \sigma^2 G = c^3 \dots \dots$ (e), where σ is a Stress between frequencies.

From Force-relation $F = \sigma A = (2\pi f r) \frac{A}{\Phi} = w r \frac{A}{\Phi} = \bar{v} \frac{A}{\Phi}$, is seen also force G becomes velocity $\bar{v}$.

In the case of Planck's-length velocity $\bar{c} = w r = \frac{\sigma \cdot \Phi}{r} r_p = \sigma \times \Phi = \left| \frac{G \cdot L_p}{r \cdot \Phi^3} \right| \Phi = \left[\frac{G \cdot L_p}{r \cdot \Phi^2} \right]$

and from relation $G \equiv \sigma \times \Phi^3$ then $\rightarrow [\bar{c} = \frac{G \cdot L_p}{r \cdot \Phi^2}]$ which is the **Light-velocity vector**.

Since r , becomes from the Beyond-Planck's-Region then $\rightarrow \bar{v} = \frac{F \cdot \Phi}{A} = \left[\frac{G \cdot \Phi}{A} \right] \dots \dots$ (f)

Equation (f) may be written as Force $G = \bar{v} \frac{A}{\Phi}$, which is a **Viscus - Damping-Force**

where $\frac{A}{\Phi}$ is a constant of Proportionality and the equation of motion is $F_G = \left[\frac{A}{\Phi} \right] \cdot \dot{x}$.

Force G is applied in all **Quantized-Universe A** as Velocity $\bar{c}$ and as Stress σ on Spaces and Anti-spaces as Spaces-relation $L_p = e^{i \cdot (\frac{\pi}{2} + 2k\pi) \cdot b}$, where from **Material-Geometry [24-58]**, Space $\equiv 1$ and Anti-Space $\equiv \sqrt{-1} = +1, -1$, and $\sqrt{-1} = i =$ The Imaginary Part into the $\rightarrow$ **Anti-Space + Space $\equiv$ motion $\equiv i \equiv \sqrt{-1} \equiv \sqrt[4]{-1} \equiv e^{-i \cdot (\frac{\pi}{4}) \cdot b} = 0,707106781 \cdot b$** .

The Base b , which for Natural logarithms issues $\ll$ The Natural logarithm $\ln(x)$ of a Magnitude x , is the Power to which, e , would have to be raised to equal $x \gg$ and Defining that $\rightarrow \ln(x)$ is the Period-needed to Grow, x , as this is in Integration $\int x$, while e^x is the **Amount of Growth** after **Period x** , and the Possible Repetitive-Permutations for moulds and elements which is $\rightarrow$ **Mould Elements = The -Growth-Periods** i.e. When Mould = Elements then is succeeded maximum and for e is e^e , and any $\log_x x$. For $\log_x x$ and Base $x = 10$ then $\log_{10} 10 = 10^{10}$ and for the two elements $[\oplus, \ominus]$ is $10^{[10]^2} = 10^{20}$ **Positions $\equiv$ Distances $\equiv r$** and since $10^{-x} = \frac{1}{10^x}$ then $b = 10^{-20}$, and **Anti-Space + Space-Positions** are $0,707106781 \cdot 10^{-20} = 1,0707106781 \cdot 10^{-19}$

In this Way The Non-Dimensional-number $[0,707106781 \cdot 10^{-1} = 0,0707106781]$,

Is Quantized in cave, r , as distance and Becomes The-Dimensional-Space in the

Decimal - System $b=10$ as cave r , and which cave is $r = 1,0707106781$ or,

$r = 1,0707106781$ m, having Unit-Area $\pi \cdot r^2 = 3.601588$ m², and the QUA-Universe is

$A = 3.601588 \cdot 10^{-19}$ m²/s, which are The Space + Anti-Space Positions in Universe ... (i)

From (h), light-velocity $\bar{v} = \left[\frac{G \cdot \Phi}{A} \right] = \frac{6,673692 \cdot 10^{-11} \cdot 1,6180339887}{3,601588 \cdot 10^{-19}} = 2.99819938 \cdot 10^8$ m/s, i.e.

Force $G \equiv$ motion, is Quantized $\rightarrow$ is Spread in { **Space and Anti-Space** } or $\equiv$ **QUA $\equiv$ {is The Quantized-Units-In-Area of Space and Anti-Space}**, and as mould Φ exists in the **Impedance b** . Impedance in Mechanics is the **Friction Coefficient**, where for Force G to be Proportional to the Light-velocity vector $c = \bar{v}$, then the Harmonic - Oscillation is an **Dumped-Oscillator** and **Can-Oscillate** due to the excitation [49] as below,

- a.. with a frequency lower than in the Undamped case and an Amplitude Decreasing with time, the **Under Damped-Oscillator** which Originates the **Quantum of motion** which is an limiting case between the oscillatory and **Non-Oscillatory** motion The *Critical Damping*, and which Originates **Light-velocity $\bar{c}$** .
- b.. with Undamped case frequency and **Decay** to the **Equilibrium-Position** without oscillation and The **Over-Damped-Oscillator** Originating the **n-times-c**.

What is Quantization of motion and Impedance is analytically referred in [83]

A **Parallel solution** becomes also from the attendant logic is as follows,

The **Three Elements** $\equiv$ Digits of the Material-Geometry are $\rightarrow \{\oplus, [\oplus \leftrightarrow \ominus], \ominus\} \equiv [+ , 0 , -] \leftarrow$

The **Permutation, arrangement**, of the Two-Elements is $P_2^1 = 2$, i.e. are $\rightarrow [\oplus, \ominus] - [\ominus, \oplus] \leftarrow$

The Three-Elements in Space need $P_1^3 = 3.(3-1).(3-2) = 6$ Positions and the same for Three-Elements in Anti-Space need $P_1^3 = 3.(3-1).(3-2) = 6$ Positions, and Total Places are $P_1^3 \cdot P_1^3 = 6 \times 6 = 36$ Positions for Spaces and Anti-Spaces as Impedance, and as before for $\log_x x$ and Base $x = 10$, then $\log_{10} 10 = 10^{10}$ and for the two elements $[\oplus, \ominus]$ the Growth is $10^{[10]^2} = 10^{20}$ Positions $\equiv$ Distances $\equiv$ Space, r , and since issues $10^{-x} = \frac{1}{10^x}$ then,

$$b = 36.10^{-20}, \text{ and velocity } \bar{v} = \frac{F \Phi}{A} = \left[\frac{G \Phi}{A} \right] = \left[\frac{6.673692 \cdot 10^{-11} \cdot 1.6180339887}{36 \cdot 10^{-20}} \right] = 2.9995163 \cdot 10^8 \text{ m/s}$$

i.e. **Ubiquity of Material-Geometry in Electromagnetism** is Everywhere. 22/3/2020

4-d... The Origination of Gravity g , from velocity c :

A... The Gravity-System, is an Infinite of $\pm$ Equilibrium-Rotating Vectors $\bar{r}$, where for

Stability $\uparrow \bar{r} \downarrow \bar{r} = 0$, and which **Gravity-System** interacts with **Hydrogen-Cave-Systems**.

The condition for **Irrotational Energy** is $\rightarrow \nabla \times \bar{B} = \nabla \times \bar{S} = 0$, or $\nabla \times \bar{B} = \nabla \bar{r} + 2\pi m f_n \bar{a} = 0$, and $\bar{r} = \pm 2\pi m f_n \bar{a}$.

Vector $\bar{r}$, occupies Both directions for Rotational-equilibrium, i.e. **The vector $\bar{r} = \pm \bar{B} \equiv \bar{S}_n = 2\pi m f_n$** , and

$f_n = \frac{B}{2\pi m_e} = \frac{E}{h}$, is the Stationary-Filling-Ocean of the Spinning-Gravity-Material Point, in the called

Empty-Space, with frequency that of Material-Point $f_n = n \cdot f_1 = \frac{E}{h} = \frac{n \cdot v}{2\pi r} = \frac{n \sigma}{4\pi r} [1 + \sqrt{5}] = \left| \frac{\sigma \cdot \Phi}{2\pi \cdot r_n} \right|$, and from $v = w \cdot r$

$$= 2\pi f \cdot r \text{ then, } f_n = v/2\pi r = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\sigma \cdot \Phi}{2\pi \cdot r_n}, \text{ and } \bar{v} = \sigma \cdot \Phi \dots (a), \text{ and } \pm \text{Spin} \rightarrow S_G = \bar{B} = J \cdot w = \pi^2 \cdot r^4 \cdot f_n = g$$

i.e. **Gravitational-Constant Force $\equiv G$** , is Spread-over **a minimum - Surface, the Layer or Conductor or, a-Surface, or The-Permissible-Path**, in-where exists Reaction as **mass From** the Energy-force F_g in

any cave, $r = L_p$ of Planck's scale of any reaction to a change of motion and which is mass the $m_g = J \cdot w^2$

and in Electricity is Impedance, where Angular-velocity $w = \frac{c}{r}$ and in the 3-Dimensional Space of the

Two Elements $[2^3 = (\oplus \leftrightarrow \ominus)^3]$, The Impedance, g_z , of the 3D-Space is $\rightarrow \ln(3) \leftarrow$

and of Anti-Space is $\rightarrow \pi\sqrt{3} \leftarrow$ and this because consist the moulds of Growth [45].

From above $\rightarrow$ **The Light velocity vector $\bar{v} = \bar{c}$ is Acting on cave, $r = L_p$, and finding Impedance**

m_g , becomes the Centrifugal-Force F_g of Cave and is Equal to the Gravity $g \leftarrow$ as

$$F_g = m_g \left[\frac{c^2}{r} \right] = J \cdot w^2 \cdot \frac{c^2}{r} \cdot g_z = \left[\frac{\pi r^4}{2} \right] \cdot \left[\frac{c^2}{r} \right]^2 \cdot \left[\frac{c^2}{r} \right] \cdot \{ 2^3 \cdot \ln(3) \cdot \pi\sqrt{3} \} = 4\sqrt{3} \ln(3) \cdot \pi^2 \cdot r \cdot c^4, \text{ or}$$

Gravity $\rightarrow \bar{g} = 4\sqrt{3} \cdot \ln(3) \cdot \pi^2 \cdot L_p \cdot c^4 \leftarrow$ Is a Force between The Spinning $S_{pg} = \bar{B}$

$$\text{and } F_g = \bar{g} = 4 \cdot \sqrt{3} \cdot 1.0986122886681 \cdot \pi^2 \cdot 1.616199 \cdot 10^{-35} \cdot [2.99819938]^4 = 9, 8076754$$

i.e. **Gravity $\bar{g}$** , is The effection of **G - force** on **$\bar{c}$** , light-velocity in the 3-DimensionalSpace and Anti-Space, 2^3 , which is the Planck-length $L_p = r$.

$$\text{Velocity-vector } \bar{v} \equiv \bar{c} = \left[\frac{G \cdot \Phi}{A} \right] \text{ and Gravity-vector } \bar{g} \equiv 4\sqrt{3} \ln(3) \cdot \pi^2 \cdot L_p \cdot c^4$$

are both **Constants** because **$\{ G, \Phi, A \equiv b \cdot \text{Impedance} \}$** are all constants.

From Inner-velocity equation $v = w \cdot r = (2\pi/T) \cdot r = 2\pi \cdot f_1 \cdot r$, wavelength $\lambda = c \cdot T = c / f_1$

cave $r = n \cdot [\lambda/2]$, then $r = n \cdot (c/2f_1)$ and $v = 2\pi \cdot f_1 \cdot [n \cdot c/2f_1] = n \cdot \pi \cdot c$ or $v = n \cdot \pi \cdot c \dots (k)$

Showing that velocities in lobes are **$n \cdot \pi$** times that of light and for $n = 1$ then $v = \pi \cdot c$

more than three times faster of light velocity, and is the **Velocity-Quantization**.

From velocity $v = n \cdot \pi \cdot c$, is seen that **light-velocity is the Quantum of Unit-velocity in L_p** and from above

the **In-Planck's-length** velocity $\bar{c} = w \cdot r = \frac{\sigma \cdot \Phi}{r_n} \cdot r = \sigma \cdot \Phi = \frac{G \cdot r}{L_p \cdot \Phi^3} \cdot \Phi = \frac{G \cdot r}{\Phi^2 \cdot L_p}$ and from relation **$G \equiv \sigma \cdot \Phi^3$**

$$\text{then } \rightarrow \left[\bar{c} = \frac{G \cdot r}{\Phi^2 \cdot L_p} \right] \leftarrow \text{which is Light-velocity-vector In } L_p.$$

For the **Out-Planck's-length** velocity equation $\bar{v}_m = n \cdot \bar{c} \cdot \left\{ \left[\frac{r}{L_p} \right] + f_n \right\}$ and from equation $\bar{v}_m = w \cdot r = n \cdot \pi \cdot c$,

$$f = \left[\frac{n \cdot c}{2r} \right], \text{ then } \rightarrow \bar{v}_m = n \cdot \bar{c} \cdot \left\{ \left[\frac{r}{L_p} \right] + f_n \right\} \leftarrow \text{which is Light-velocity-vector Out } L_p.$$

Photon was proved to be a Material-point in cave, r , where its **Inner Storage** is **the Standing-Stationary wave** the Electromagnetic -Wave $[E^2 + H^2] = 2 \cdot (2r) \cdot c \cdot \sin 2\phi$ with n , Lobes representing the **Normal-mode vibration** with frequencies $f_n = n \cdot f_1 = \frac{E}{h} = \frac{n \cdot v}{4r} = \frac{n \sigma}{2\pi r} [1 + \sqrt{5}] = \frac{n [\sigma \cdot \Phi]}{2\pi \cdot r_n}$, and **Outward The-Storage**

which is the Propagating Electromagnetic - Wave. $\rightarrow \{ [\epsilon E^2 + \mu B^2] = 2 \cdot \lambda \cdot c \cdot \sin 2\phi \} \leftarrow$ where

Particle $2r = n \cdot \lambda$, Cave, r , is the Electromagnetic-Energy-Storage, and Electromagnetic-Radiation E, B , is **The Wave Conveyor of Cave, r , with frequency $f = \text{Energy } E / \text{Planck-constant } h$, or $f = E / h$.** (Fig-6), i.e.

Gravity $\bar{g}$, is The effection of **G Force**, on **$\bar{c}$** , light - velocity, in the 3-Dimensional-Space and Anti - Space, 2^3 , of minimum Planck-length $L_p = r$. For more analysis in [90].

and from relation **$\sigma \cdot \Phi^3 \equiv G \rightarrow [1.845632 \cdot 10^{11}] \cdot [3.6180339887] = 6,673692 \cdot 10^{-11}$** .q.e.d.

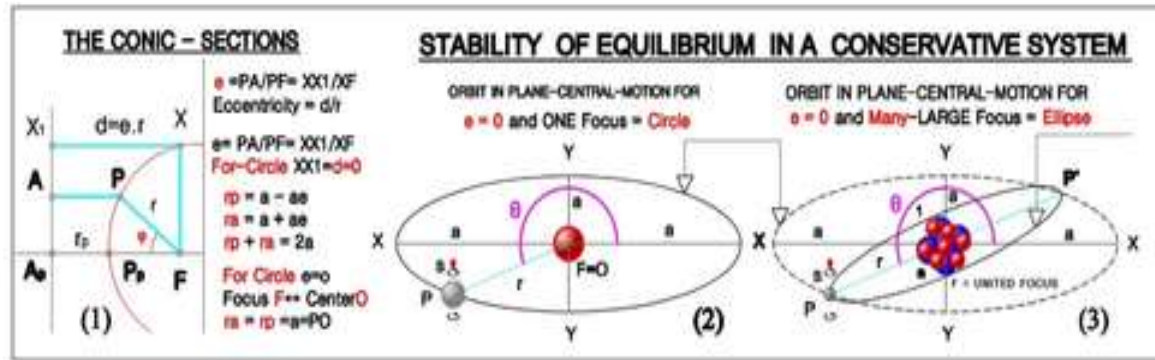


Figure – 8 - : The Two Points Problem Stability of Equilibrium with One or Two Planets.

Electron is created through the vibration, f_n , in the **Energy-Space**, $g - \pi$, meters.

Electron cave is the minimum cave of light-velocity c to enter and possessing max

Energy of Planck's length L_p which is the h .

5-d... The Origination of Electron e , and e - Charge :

Electron is created through the vibration, f_n , in the **Energy-Space**, $g - \pi$, meters and follows both Rotational and Linear motion and so the **Constant-Energy** k is the same. From M-Point, frequency $\rightarrow f_N = n \frac{(1+\sqrt{5})\sigma}{4\pi r}$,

and $\rightarrow w = 2\pi \cdot f_N = n \frac{(1+\sqrt{5})\sigma}{2r} = \left| \frac{n}{r} \right| \cdot \frac{(1+\sqrt{5})\sigma}{2}$. The **Spring-like central-force** from a fix point, the **Source**, on an attached, probe, mass is $\rightarrow F = -k r = -k r \cdot \bar{r}$ as equation $\ddot{x} + w^2 x = 0 \dots (1a)$

The general solution of (1a) is $x = A \sin w_n t + B \cos w_n t$, where A, B are constants and evaluated from the initial conditions and which become $x = [\dot{x}(0)/w_n] \cdot \sin w_n t + x(0) \cdot \cos w_n t \dots (1)$

The Natural-frequency in Planck's length for the **Primary-Particle** occupying the less **Negative-charge frequency**, is the **Electron**, and is as equation (1) with solution,

$$\frac{w_n}{2\pi} = f_e = \frac{1}{2\pi} \sqrt{\frac{k}{m}}, \text{ or } 4\pi^2 f_e^2 \cdot m_e = k = \pi g \text{ and } \rightarrow m_e = \frac{g}{4\pi f_e^2} \dots (2)$$

where $k = \text{Unit-Spring-Force} \equiv [\text{meter of area}] \cdot [\text{meter of force} \equiv \text{stress}] \equiv \pi g \dots (2a)$

From Planck's equation $f_e = E/h = [-13,6 \times 1,602 \cdot 10^{-19} = 2,17872 \cdot 10^{-18} \text{ Joule}] / [6,626 \cdot 10^{-34} \text{ J.s}]$

$= 3,2881029 \cdot 10^{15}/s$, where min-energy of $-13,6 \text{ eV}$ is that of Hydrogen-atom

Substituting all the **minimum-meters of Planck's scale** then, **Electron-mass is**,

$$m_e = \frac{g}{4\pi f_e^2} = \frac{9,8076754}{4\pi [3,2881 \cdot 10^{15}]^2} = -7,219016 \cdot 10^{-32} \text{ kg} \dots (2b)$$

$$f_e = 3,2881029 \cdot 10^{15}/s, \text{ and } L_e = 1,6819781 \cdot 10^{-17} \text{ m} \dots (2c)$$

Equations become from relation $\rightarrow 4\pi \cdot f_e^2 \cdot m_e = g \leftarrow$ In Planck's length. **Electron-Charge**

becomes from the **Periodic excitation** of the motion of the $\oplus$, constituent to the $\ominus$, constituent **Tack-Geometry**, **Not** in loop ($\oplus \leftrightarrow \ominus$), **But** through the **One way**-N-Electric-Paths [$\oplus \leftrightarrow \ominus$],

which formulate the **Electric-Field-Pattern**, following charge-equation $\rightarrow \bar{q} \equiv \frac{m_e c^2}{2} = \frac{g c^2}{8\pi f_e^2}$. From

Gravitation $G = k_e \cdot g$, and Voltage $\bar{V} \equiv V_p \equiv \frac{c \cdot \bar{q}}{h}$, Spin $= B/\pi$, where Electrons-equation of motion into

$\oplus \rightarrow \ominus$ is $\ddot{r} + w^2 r = 0$ and equation's Solution $\rightarrow 4\pi \cdot f_e^2 \cdot m_e = g \leftarrow$ is the **Electron**, and **Charges**, $\bar{q}$.

Electron Charge $\bar{q}$ Becomes from Magnetic Field M which creates the Electric - Field, E , which is acting

on Charge $\bar{q}$, and the acting Force per second creates Work which is conserved and coincide with The Planck's constant h . This is because $h \rightarrow J.s = N.m.s = \text{Power}$, where from, **Energy** = **Power** x **Time**, issues the Beyond

Planck's length L_p , & Voltage V as $\rightarrow \bar{q} \equiv \frac{K_E}{V_p=1} = \frac{m_e c^2}{2} = \frac{g c^2}{8\pi f_e^2 \cdot 1}$ and $\bar{V} \equiv V_p \equiv \frac{c \cdot \text{Charge}}{\text{Total-Energy} = h} = \frac{c \cdot \bar{q}}{h} \dots (3)$

Using the two Energy-equations for **Plane-motion** $\rightarrow f_n = \frac{1}{2\pi} \sqrt{\frac{k}{m}}$ and **Orbital-motion** $\rightarrow a = \sqrt[3]{\frac{1}{k \cdot f^2}}$,

And for **Unit Energy-Space-frequency** $k = g$, $a = \pi$, then $\rightarrow g \cdot f^2 \cdot \pi^3 = 1 \dots (4)$

Frequency $f_n = \sqrt[2]{\frac{1}{g \cdot \pi^3}} = \sqrt[2]{\frac{1}{9,808238 \cdot \pi^3}} = 1,8133418 \cdot 10^{-3}$, i.e. The **Unit-Charge-Cave** $\bar{q}$ into Hydrogen cave

is $[a = 1,82043047 \cdot 10^{-12} \text{ m}] \cdot [1,813342 \cdot 10^{-3}/s] = 3,3010625 \cdot 10^{-15} \text{ C}$

From equations Charge and Voltage is the **Self - Growing** Property of frequency f_n in Material-Point, therefore and for Hydrogen-cave is equal to $\rightarrow \bar{q} \cdot \Phi$, and this because **Gravitational Force** is equal to $\rightarrow$ the Geometric Resultant of light-velocity c , acting on **Electron-Unit-Charge** $\bar{q} \leftarrow$ or, $G = c\sqrt{2} \cdot \bar{q}$, then Electron-Charge is

$$\bar{q}_{\text{Electron}} = \frac{G}{c\sqrt{2}} = \frac{6,6736923 \cdot 10^{-11}}{1,41429,2,9979346 \cdot 10^8} = 1,574 \cdot 10^{-19} \text{ C}.$$

For Photon issues that of Gravitation in Planck's-cave $\rightarrow G = f_n \cdot \sqrt{2} \cdot \bar{q}$ and for Photon is ,

$$\bar{q}_{\text{Photon}} = \frac{G}{\sqrt{2} \cdot f} = \frac{G \cdot h}{\sqrt{2} \cdot E} = \frac{[6,6736923 \cdot 10^{-11}] \cdot [6,62606957 \cdot 10^{-34}]}{\sqrt{2} \cdot E=1} = 3,127 \cdot 10^{-44} \text{ C}.$$

6-d... The Origination of Hydrogen - Cave H , e :

The Light velocity vector $\bar{v} = \bar{c}$ is Acting on cave , $r = L_p$, and finding Impedance which is the mass m_g becomes the Centrifugal-Force F_g of the Cave and is Equal to Gravity **g** , while the **Light velocity vector** $\bar{v} = \bar{c}$, acting on **an-cave** , $r \neq L_p$, finds The-Impedance Z_c , of the Vector $\bar{c}$, and becomes the Angular Momentum-Vector B , of the minimum -Energy Cave in L_p , which is equal to $B \equiv E \equiv r Z_c \bar{c} \dots (1)$ where **E** = The Planck's Total-Energy $E_p = h = 6,62606957 \cdot 10^{-34} \text{ J} \cdot \text{s}$, **r** = The min-Energy Cave of Hydrogen Z_c = The Total Impedance in Universe , of **Space + Anti-Space** , from velocity motion and $\bar{c}$ is The light-velocity in m/s . Equation (1) becomes $\rightarrow r Z_c \bar{c} = h \leftarrow \dots (1a)$

The **Three Elements** $\equiv$ **Digits** of Material-Geometry are $\{\oplus, [\oplus \leftrightarrow \ominus], \ominus\} \equiv [+ , 0 , -]$ and as before for $\log_x x$ and Base $x = 10$ then $\log_{10} 10 = 10^{10}$ is the Growth , **Impedance is the Anti-Growth or Anti-logarithms** 10^{-10} of their **g-Position** so $\text{Antilog}_{10}^{-g/10} = 0,10460975$. For the three dimensions Total-Impedance in cave

$Z_c = 0,10460975 \cdot (10^{-10})^3 = 1,046097 \cdot 10^{-31}$ and $r_H = \frac{h}{c Z_c} = \frac{[6,62606957 \cdot 10^{-34}]}{2,99798 \cdot 10^8 \cdot 1,0460975 \cdot 10^{-31}} = 2,1127839 \cdot 10^{-11} \text{ m}$ and is the Hydrogen cave with the minimum Potential-Energy of -13,6 eV , in minimum Planck's cave ,

i.e. $L_H = r = \frac{h}{c Z_c} = 2,1127839 \cdot 10^{-11} \text{ m}$ is the min-cave in Planck's-cave with the max-Energy **h** .

From Kepler third law , Closed-Space-Energy equation of Newton's Laws of motion the

$$\text{Constant } k = v^2 \cdot r = (w \cdot r)^2 \cdot r = \left[\frac{2\pi}{T} r \right]^2 \cdot r = \frac{4\pi^2 r^2}{T^2} \cdot r = \frac{4\pi^2 r^3}{T^2} = 4\pi^2 \cdot \frac{r^3}{T^2} = 4\pi^2 \cdot r^3 \cdot f_p^2 \dots (k)$$

Because (k) is constant , $r^3 \cdot f_p^2$, is also a Constant multiplication of cave , **r** , and frequency **f** is also .

The **Work** $\equiv$ **motion** , which is conserved in cave **r** as the **n** frequencies of $f_N = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{2\bar{B}}{\pi^2 r^4}$, are related to Spin B , and for the Damping-cave $\rightarrow r(t) = r(t+w) \leftarrow$ as Planck's scale is with **min-Damping = 1** , and **Unit-Energy-Quantity** W_u , (the critical-energy-unit in the min , r) to be the Unit-Stress-Gravity **g** , as $k = E = \frac{T^2}{a^3} = g = \frac{1}{f^2 \cdot a^3}$ and for $a = r$ then $g \cdot r^3 \cdot f_p^2 = 1$, which is the Kepler second constant-Unit-law for areas i.e.

Stress g , when is entering into the minimum cave , a , of a minimum Surface , **Then from the Period of Rotation T** , on the Perimeter , **is created in Surface The minimum Quantity of Energy-cave and is that of Hydrogen-Atom** , where issues , **g f² $\equiv$ The Energy- Part embodied with stress , g , and cave a³ $\equiv$ The Space-Part** , in the 3-DOF Space , as **Period and Frequency** , $T^2 = g a^3 = 9,8076925 \cdot [2,1127839 \cdot 10^{-11}]^3 = 9,2497939 \cdot 10^{-32} \text{ s}$, and Period $T = 3,013473 \cdot 10^{-16} \text{ s}$, or frequency $f = 3,3184302 \cdot 10^{15} / \text{s} = 3,3184302 \cdot 10^{15} \text{ H}$

From equation $E = h f = 6.62607 \cdot 10^{-34} \cdot 3,3184302 \cdot 10^{15} = 2,175999 \cdot 10^{-18} \text{ J} / (1,6 \cdot 10^{-19}) = 13,599999 \text{ eV}$ which is a **Quantized Energy corresponding to Hydrogen-Atom-cave**.

Above Quantity is the Quantum-Energy in the minimum cave a_H of L_p .

It was shown that **in Conservative Systems** of Central-Force , the Total energy **E** is conserved at Periapsis , and Energy $E = \frac{GMm}{2a}$, The eccentricity $e = \sqrt{1 + 2EL^2/G^2M^2m^3}$, which for $e = 0$, a circle , becomes

$$E = - \frac{G^2 M^2 m^3}{2 L^2} , \text{ i.e. Total-Energy is always Negative . From Hydrogen cave issues } k = E = \frac{T^2}{a^3} = g = \left[\frac{4\pi^2 a}{GM} \right]$$

therefore , $GM = \frac{4\pi^2 a}{g}$ and from Total-energy $E = - \frac{GMm}{2a}$, Rotational-Momentum $L = \sqrt{(1 - e^2) \cdot GMm^2 \cdot a}$

The eccentricity $e = 0$, $G M m = - 2aE$, and then $\rightarrow L^2 = GMm^2 \cdot a = - 2aE[a]m = - 2a^2 \cdot E m$.

i.e. Equation $L^2 = - 2a^2 \cdot E m$, denotes that **Angular-Momentum $L \equiv B$ in the Circular Orbit Rims is always Negative and equal to Spin $\rightarrow L = - a \sqrt{2Em}$** , while **$E = - L^2 / 2ma^2$** .

The lightest and the less-Energy $-Z_c$ = mass Particle of this Universe , is the **Hydrogen** with the maximum Quantized - Energy of 13,6 eV . In-Spaces or Volumes with the maximum Energy **E** , is formulated the Hydrogen - cave , which oscillates under the action of the Inherent forces in M-Points and which are the **Instruments** that , **Golden -Ratio- frequency** uses to **Kick-Start** everything In this world .

Both motions , The **Periodic and Rotational** , exist as the Mean between the Two Primary - Opposite in PNS $\equiv$ Primary-Neutral-Space . This Mean is The Ocean of the , **Two kinds of Spins** created from the inner motion in Material-Points both Oriented by the acceleration **g** , created from the Rotational-motion and which **g** , continually effects on Spins through which force **G** , Flows to all Energy Structures wherever these are .

The **Strong-force** in Nucleus is as , $F_{\text{nucleus}} = h \cdot f_n \equiv h \cdot n \cdot \frac{(1+\sqrt{5})\sigma}{4\pi r} \equiv h \cdot \left[\frac{n \cdot \bar{B}}{\pi^2 r^4} \right] \equiv h \cdot \frac{n \Phi \sigma}{2\pi r} \equiv h \cdot \frac{n \sigma (1+\sqrt{5})}{4\pi r} \approx$

$1 - 5 \cdot 10^{10} \text{ Tesla}$, and for $F_{\text{photon}} = \frac{[\oplus \rightarrow \uparrow \langle \ominus \rangle]}{r^2} = \frac{\sigma \cdot \sigma}{r^2} = \left| \frac{\sigma}{r} \right|^2 \equiv \left| \frac{2 \cdot B}{\pi \cdot r^4 \Phi} \right|^2$. From $r_{\text{min}} = 1,07 \cdot 10^{-7} \text{ m}$ and

$f_p^2 = \frac{1}{r^3}$ or $f_{\min} = 2,839844.10^{10}$ H, then Bonding Energy $L = h.f_N = 6.62607.10^{-34} \cdot 2,8398447.10^{10}$ J / $1,6.10^{-19} = 1,176063.10^{-6}$ eV, and $\rightarrow E = -L^2 / 2a^2m$ and for $a = r \rightarrow a^2 = L^2 / 2Em = \frac{[1,17606.10^{-6}]^2}{2(13,6)1.10^{-12}} = 5,08501.10^{-4}$ and then, $r = a = 2,2549966.10^{-2}$ m, meaning The **Spin-Polhode** of the Hydrogen-cave.

From Orbit equation $a = \sqrt[3]{\frac{1}{g.f^2}} = \sqrt[3]{\frac{1}{9,808[2,8398447.10^{10}]^2}} = 5,018918.10^{-8}$ m, are The Brackets $\equiv$

[Proton-Electron-Hook] $\equiv$ {Electric-Field-Loops} $\rightarrow$ Hydrogen -Atom-Radius.

E.. : THE ORIGIN OF SPIN AND ENERGY IN LOOPS :

It is an Application to Material-Points $[\oplus \leftrightarrow \ominus]$, by considering the Positive-constituent with angular velocity $\bar{w} = \bar{v} / r = \frac{\sigma}{2r} [1 + \sqrt{5}]$ (1) [70], and for an angle 45° from x axis, where then the Ellipsoid of Angular velocity is Perpendicular to the Plane of motion. Moment of Inertia to, z , axis is that of Sphere equal to $J_3 = \frac{\pi r^4}{2}$

which is the same in all Principal axes, and exists, $J = J_1 = J_2 = J_3 = \frac{\pi r^4}{2}$, therefore Angular-Kinetic-Energy $\equiv$ Angular-velocity-Ellipsoid where then becomes, $J_1 w_1^2 + J_2 w_2^2 + J_3 w_3^2 = 2E$ (2)

The Energy-Ellipsoid as $\bar{B} \equiv \text{Spin}$ is $\rightarrow w_1^2 + w_2^2 + w_3^2 = \frac{2E}{J^2} = \frac{4E}{(\pi r^4)^2} = \frac{B^2}{J^2}$. **Angular-momentum $\equiv$ Spin $\equiv \bar{B} \equiv [\pi \sigma r^3 (1 + \sqrt{5}) / 4]$ (3)** In Figure -8- and for the center, K, of $\oplus$ sphere, issues $\bar{v}_K = [\bar{w} \cdot \bar{r}_K] = [\frac{\sigma[1+\sqrt{5}]}{2r} 2r] = \sigma [1 + \sqrt{5}]$ and $\bar{B} = \bar{S} = [\bar{r} \cdot m\bar{v}] = [r \cdot m \cdot \sigma(1 + \sqrt{5})]$ and for $m = 1$ Then $\bar{B} = [r \sigma (1 + \sqrt{5})]$.

The Interchangeable Ellipsoids of Angular velocity [70-P49], and Momentum for the same Moment of Inertia is $J_1 = J_2 = J_3 = J_0$, and Angular Velocity $w_1 = w_2 = w_3 = w$, the Momentum $B_1 = B_2 = B_3 = B$ becomes $3J w^2 = C$ and $3B^2/J = C$, and since for circle $J = \frac{\pi r^4}{2}$ then $\frac{3\pi r^4}{2} w^2 = C = (\frac{3\pi r^4}{2}) w^2 = (\frac{3\pi r^2}{2})(rw)^2 = (\frac{3\pi r^2}{2})[\sigma(1 + \sqrt{5})]^2 =$

$3\pi r^2 \sigma [3 + \sqrt{5}] \rightarrow \text{The Ellipsoid of Angular-velocity, } \bar{w}$, and $3B^2/J = \frac{3(rmv)^2}{J} = \frac{3(rv)^2}{J} = \frac{3r^2 \cdot \sigma^2 [3 + \sqrt{5}]}{4} [\frac{2}{\pi r^4}] =$
 $\frac{3 \cdot \sigma^2 [3 + \sqrt{5}]}{2\pi r^2} = \frac{3 \cdot \sigma^2 \cdot \Phi^2}{\pi r^2} = \frac{3 \cdot f^2 \cdot 4\pi^2 r^2}{\pi r^2} = \frac{3 \cdot (2\pi f)^2}{\pi} = \frac{3 \cdot w^2}{\pi} \rightarrow \text{The Momentum-Ellipsoid, } \bar{B}$, which is the same as

The Angular-momentum In Planck's-Length $\equiv \text{Spin} \equiv |\bar{B}| \equiv \pi^2 r^4 f$ (3)

The value of $|\bar{B}| = [2 \cdot 8,79455.10^{-35} \cdot 1,6180339] = 2,845976.10^{-34}$ {Kg/m/s}. For Planck-Length $r_p = 1,61623.10^{-35} \sqrt{3} \pi = 8,79455.10^{-35}$ m, velocity $|\bar{v}| = \frac{\sigma}{r} [1 + \sqrt{5}]$ and from (3) then $\rightarrow$

Planck-cave-Stress $\sigma = \frac{2\bar{B}}{\pi r^3 \Phi} = 1$, and **Total-Energy $2E = [J w]^2$** ,

From $|\bar{v}| = \frac{\sigma}{r} [1 + \sqrt{5}] = c = 3.10^8$ m/s then, $\sigma = \frac{3.10^8}{3,679551.10^{34}} = 8,1477332.10^{-27}$ Kg/m²

$|\bar{w}| = \frac{\sigma}{2r} [1 + \sqrt{5}] = (\frac{8,1477332.10^{-27}}{2 \cdot 8,7945510^{-35}}) \cdot 3,2360675 = 1,499.10^8$, or $|\bar{w}| = 1,5.10^8$ rad / sec,

For $\sigma = 8,14773310^{-27}$ Kg/m² and $\bar{B} = 5,691952.10^{-34}$ J then, Period $T = \frac{2\pi}{w} = \frac{2\pi r}{v} = \frac{4\pi r}{\sigma(1 + \sqrt{5})} = \frac{4\pi \cdot 8,79455.10^{-35}}{\sigma(1 + \sqrt{5})} = \frac{3,4151}{\sigma} 10^{-34}$ s, or **Period $T = [\frac{4,191584}{10^9}] = 4,191584.10^{-9}$ s**, and frequency $f_1 = \frac{1}{T} = 2,38573294.10^{34}$ Hz

which is the **Planck-frequency**. From above issues,

a).. The **Spin** of cave, r , is Equal to the **Angular-momentum-Vector** $\rightarrow \text{Spin} \equiv |\bar{B}| \equiv r \sigma \Phi$ which contains and is the Golden-Radius-frequency Φ as Pressure, σ , in cave r .

b).. In Planck's-length [for light velocity $c = 3.10^8$ m/s], **velocity** is $|\bar{c}| = \frac{\sigma}{r} [1 + \sqrt{5}]$ m/s and in cave $r_p = 8,79410^{-35}$ m, The **Pressure $\sigma = \frac{r \cdot c}{[1 + \sqrt{5}]} = 8,147733.10^{-27}$ Kg/m²**.

c).. In Planck's-length the Period of Oscillation is $T = \frac{4\pi r}{\sigma(1 + \sqrt{5})} = 4,192.10^{-8}$ s, and

Frequency $f_p = \frac{1}{T} \equiv \frac{\sigma(1 + \sqrt{5})}{4\pi r} = 2,3857265.10^7$ Hz, which is the minimum in Planck-cave.

The extreme for stresses $\sigma_1, 2 = \sigma_1 / 2 \pm (\frac{1}{2}) \cdot \sqrt{\sigma_1^2 + 4 \cdot \sigma_1^2} = \sigma_1 \cdot [1 \pm (\sqrt{5})] / 2 = \sigma \Phi$,

velocity $v = (w \frac{2\pi}{T}) r = 2\pi r \cdot f = [\frac{\sigma}{2}] \cdot (1 + \sqrt{5})$, frequency $f = \frac{(1 + \sqrt{5}) \cdot \sigma}{4\pi r}$, Period $T = \frac{4\pi r}{\sigma(1 + \sqrt{5})}$

d).. From Kepler-Orbit-Vibration the equation of inverse Period $\rightarrow f_n = \frac{(1 + \sqrt{5}) \sigma}{4\pi r} = [\frac{\sigma}{2\pi r}] \Phi$,

$f_n^2 = \frac{\sigma^2}{4\pi^2 r^2} \Phi^2 = \frac{1}{g \cdot a^3}$, and $g \cdot a^3 \cdot \Phi^2 = \frac{4\pi^2 a^2}{\sigma^2}$, or $a = \frac{1}{g} [\frac{2\pi}{\sigma \Phi}]^2$ and from Work in Orbits

$W = 2E = B w = J \cdot w^2$, or $2E = 2\pi f B$, i.e. $\rightarrow \text{Total-Spin*Frequency} \equiv \bar{B} \cdot f = \frac{E}{\pi}$, and

Energy $\equiv$ motion in Planck-scale-cave $r = L_p$, is $2E = \bar{B} f_n = [\frac{(1 + \sqrt{5}) \sigma}{4\pi r}] \cdot \bar{B} = [\frac{\sigma}{2\pi r}] \cdot \bar{B} \Phi$, or

$$E = [\Phi \frac{\sigma}{4\pi r}] \cdot \bar{B} \equiv \frac{|\bar{B}|^2}{2\pi^2 r^4} \equiv \frac{|\bar{B}|}{2f} \quad \dots\dots (4) \quad \text{i.e.}$$

Energy of Particles In-Beyond Planck-cave is dependent on Their Spin Only , and for the

Electron with cave $r = a_e = 1,6819781 \cdot 10^{-17} \text{m}$, and Principal - stress $\sigma = 1$, then ,
 $E = [\Phi \frac{\sigma}{4\pi r}] \cdot \vec{B} = 1,6180339 [(\frac{1}{4\pi \cdot 1,6819781 \cdot 10^{-17}})] \cdot 2,845976 \cdot 10^{-34} = \frac{2,17872 \cdot 10^{-18}}{1,602 \cdot 10^{-19}} = \mathbf{13,6 \text{ eV}}$

All above equations define $\rightarrow$ **The Ubiquity of Golden-Ratio- Φ** $\leftarrow$ in motions in
Angular-Momentum , Stresses , Frequency or Velocity in nature[64-A-B-C]

1-e.. The Dynamic Structure of Atom :

The two elements In Nature are Two , **motion** $\equiv$ **Energy** and **Space** $\equiv$ **Displacement** only . In Mechanics
 Work $\equiv$ Energy $\equiv$ motion is produced as , **Force** (x) **Displacement** and is conserved.

In order that **Motion** is **Conserved as Displacement** in all directions , then this Displacement must be kept ,
Quantized , in a **Finite Space** differently is annihilated . In Mechanics the only-Possible motion in a Finite
 Space , is the Periodic excitation $[\leftrightarrow]$ or , the *Reciprocating-motion* , and the Revolving motion $[\oplus \cup \ominus]$
 which defines the **Quality** of Particles .The Rotational motion defines different Period ,frequency or Energy .
 Atom is a Finite-Energy-Space in where exists motion $\equiv$ Energy $\equiv$ Force x Orbit-ray . Motion occurs from
 Electrons with Impedance $Z_c \equiv$ mass [m] executing Circular and Elliptical-Plane-Orbits from Nucleus mass
 [M] obeying the **Kepler's laws and Newton's Lagrange laws** for Mechanics in an Equivalent System .

Lagrange equations of motion in any Potential is , $\frac{d}{dt} [\frac{\partial L_a}{\partial \dot{q}_i}] - \frac{\partial L_a}{\partial q_i} = 0$,where, Lagrangian $L_a = (T_K - L) \dots (1)$

L = The Potential Energy $\equiv$ Pointy motion $\equiv$ Spin
 T_K = Kinetic-Energy $\equiv$ Linear or Rotational-motion
 $T_K = T(q_1, q_2, \dots, q_N, \dot{q}_1, \dot{q}_2, \dots, \dot{q}_N)$
 q_i = The generalized coordinates,
 $\dot{q}_i$ = The generalized velocities . $i=1,2,\dots,N$
 θ = The $r \rightarrow v \uparrow$ angle on Orbit-Nucleus
 The Lagrangian of motion is (1) $\downarrow$ as

$L_a = \frac{1}{2} m \dot{r}^2 - V(r) = \frac{1}{2} m [\dot{r}^2 + \dot{\theta}^2] - V(r) \dots (1)$ since $\dot{r} = \dot{r} + r \dot{\theta}$ and the coordinates
 of electron are given by the Polar-coordinates (r, θ) , and are respectively.

Equations of motion $\rightarrow \frac{d}{dt} [\frac{\partial L_a}{\partial \dot{r}}] - \frac{\partial L_a}{\partial r} = 0$ and $\frac{d}{dt} [\frac{\partial L_a}{\partial \dot{\theta}}] - \frac{\partial L_a}{\partial \theta} = 0 \dots (2)$

Angular momentum vector $\vec{L} = r \times m \vec{v} = m \cdot r \cdot r \dot{\theta} = (mr^2 \cdot \dot{\theta})$ and $r^2 \cdot \dot{\theta} = \frac{L}{m} \dots (2a)$

and from Kepler's law of areas $dA = \frac{1}{2} \cdot r \cdot r \cdot d\theta = \frac{1}{2} \cdot r^2 \cdot d\theta$, or $dA/dt = \frac{1}{2} \cdot (\frac{L}{m}) = \frac{L}{2m}$

i.e. the area swept by the central radius r , is $\rightarrow \frac{dA}{dt} = \frac{L}{2m} = \mathbf{constant} \dots (3)$

Lagrange's equation (2) for the r, θ , coordinates becomes , $\frac{d}{dt} [m \cdot \dot{r}] - [m \cdot r \cdot \dot{\theta}^2] + \frac{\partial V}{\partial r} = 0$, and
 integrating $\frac{1}{2} m \dot{r}^2 + \frac{1}{2} [\frac{L^2}{mr^2}] + V(r) = E \dots (4)$ where E is the Energy = the motion in Atom-cave , r .

Solving (4) to velocity then **Velocity** $\dot{r} = \sqrt{\frac{2}{m} [E - V(r) - \frac{L^2}{2mr^2}]} \equiv \sqrt{\frac{2}{m} [E - \{\frac{k}{r} + \frac{L^2}{2mr^2}\}]} \dots (5)$ **i.e.**

Electron's Velocity $\bar{v}_e = \dot{r}$, the motion , is depended on the **Total Energy E of the cave , r** ,
 the Orbit and of the **Angular-Momentum Vector L of caves , which is equal to Spin , S** .
Since Energy-Areas dA/dt , are constant , consist The Potential-Energy in Capacitors .

2-e.. The Atoms Physical Properties :

1.. Total Energy $E = T_K + L \equiv$ The constant of Integral.

2.. Spin $\equiv$ Torsional momentum $\equiv L \equiv B = \text{constant}$.

3.. Potential Energy $U = V(r) + \frac{L^2}{mr^2} = -\frac{k}{r} + \frac{L^2}{mr^2}$, where k = a constant , and then ,

a... As $r \rightarrow 0$, then $U = -\frac{k}{r} + \frac{L^2}{mr^2} = \frac{1}{r^2} [\frac{L^2}{2m} - k r] \equiv \infty \rightarrow$ Strong-Forces

b... As $r \rightarrow \infty$, then $U = -\frac{k}{r} + \frac{L^2}{mr^2} = \frac{1}{\infty^2} [\frac{L^2}{2m} - k r] \equiv 0 \rightarrow$ PNS-Field

c... As $r \rightarrow \infty$, then $U = -\frac{k}{r} + \frac{L^2}{mr^2} = -\frac{1}{\infty} [-\frac{L^2}{2mr^2} + k] \equiv < 0 \rightarrow$ Black Hole

d... As $r \rightarrow \frac{L^2}{2km}$, then $U = \frac{4k^2m^2}{L^4} [\frac{L^2}{2m} - \frac{L^2}{2m}] = 0 \rightarrow$ Turning-Points

e... As $r \rightarrow \frac{L^2}{2km}$, then $U = \frac{4k^2m^2}{L^4} [\frac{L^2}{2m} - \frac{L^2}{2m}] = 0 \rightarrow$ Black-Hole i.e.

For a , The Potential-Energy becomes infinite (∞) , as $r \rightarrow 0$, as this happens in Focus where

Protons are very close to Neutrons . These are the Nucleus Strong-forces .

For b , The Potential-Energy becomes Zero (0) as $r \rightarrow \infty$, as this happens in – PNS –
 Energy-field where time , T , is not existing and Energy , E , is Infinite .

For c , The Potential-Energy U , becomes Negative (< 0) as $r = \infty$, for any L and r .
 Integrating (3) then , $A = T L / 2m = 2 a b$, where T is the Period of Orbital rotation and
 $b^2 = a^2 - (ae)^2$ and from Kepler laws $\frac{T^2}{a^3} = \frac{4\pi^2 m}{2E} = \frac{4\pi^2}{2E/m} = \frac{4\pi^2 a}{GM}$ or $T^2 = \frac{4\pi^2 a^3}{GM} = \text{constant} \dots(6)$

Energy $E = \frac{1}{2} m \dot{r}^2 + \frac{L^2}{2mr^2} - \frac{GmM}{r}$, $L = m.r^2 . \dot{\theta}$ (7) and it is the **Energy in Atom**

The **First-term** is the Kinetic-Energy of the Planet on Orbit ,

The **Second-term** is the Constant-Rotational-Energy OR the Spin of Atom ,

The **Third-term** is the Constant-Gravitational-Potential-Energy .

When velocity $\dot{r}$, of the First-term is zero , and this happens at the turning Points then ,

$$U = \frac{L^2}{2mr^2} - \frac{GmM}{r} = 0 , \text{ and } U' = \frac{\partial U}{\partial r} = -\frac{k}{r} = f + \frac{L^2}{2mr^3} = 0 ,$$

$$U'' = \frac{\partial^2 U}{\partial r^2} = -\frac{\partial f}{\partial r} + \frac{3L^2}{mr^4} > 0 , \quad \dots\dots(8) \quad \text{and} ,$$

$$\frac{\partial f}{\partial r} < \frac{3L^2}{mr^4} \text{ becomes according to Position } r_o \text{ and } \frac{\partial f}{\partial r_o} < -\frac{3f(r_o)}{r_o} \quad \dots\dots(8a)$$

2e.. The Boundedness of Orbits :

The general solution of (5) is , $\frac{1}{r} = \frac{Gm^2M}{L^2} + c_1 \cdot \cos \theta$... (5a) , where c_1 is a constant and

from Kepler's relation $r = \frac{a(1-e^2)}{1+e \cos \theta}$ inverting then $\frac{1}{r} = \frac{1}{a(1-e^2)} + \frac{e \cos \theta}{a(1-e^2)}$ and compared

to prior then $c_1 = \pm e \frac{Gm^2M}{L^2}$ and $\frac{1}{r} = \frac{Gm^2M}{L^2} \pm e \frac{Gm^2M}{L^2} = \frac{Gm^2M}{L^2} [1 \pm e]$ (9) and

$$\text{Semimajor axis } a = \frac{L^2}{Gm^2M(1-e^2)} \equiv \frac{GMm}{2E} \quad \dots\dots(9a)$$

$$\text{Total-Energy } E = \frac{G^2m^3M^2}{2L^2} (e^2-1) \equiv \frac{GMm}{2a} \quad \dots\dots(9b)$$

$$\text{Eccentricity } e = \sqrt{1 + \frac{2EL^2}{G^2M^2m^3}} \quad \dots\dots(9c)$$

$$\text{Spin} \rightarrow \bar{B} \equiv L = \sqrt{(1-e^2) \cdot GMm^2 \cdot a} \quad \dots\dots(9d)$$

$$\text{Energy in Orbit. } E = -\frac{GMm}{2r_p} (e-1) \text{ and } L = \sqrt{(1+e) \cdot GMm^2 \cdot r_p} \quad \dots\dots(10)$$

$$\text{From Orbit-Geometry is } g.f^2.a^3 = 1 , \quad g.f^2.\pi^3 = 1 , \text{ and } E = hf \quad \dots\dots(11)$$

Using the known equations for Spin then Spin = $\bar{B} = (\pi^2 r^4) \cdot f_n$ = The Energy in **n**

wave-node loop where $f_n = [n \frac{\sigma(1+\sqrt{5})}{4\pi r}] \equiv \frac{(1+\sqrt{5}) \cdot \sigma}{4\pi r} = \frac{\Phi \cdot \sigma}{2\pi r} = \frac{E}{h} \quad \dots\dots(12)$

$$\bar{B} = [\pi \cdot r^3 \cdot \sigma(1+\sqrt{5})/2] , \text{ Total - Energy } 2L = 2n(3+\sqrt{5}) [\frac{\sigma^2}{\pi r^2}] \equiv [\frac{nh\sigma\Phi}{2\pi r^1}] \dots\dots(13)$$

$$\text{From relation } f_1 = [\frac{1}{\pi^2 r^4}] \cdot \bar{B} \text{ and } \bar{B} = \frac{\pi r^3 \sigma (1+\sqrt{5})}{4} \text{ then } \bar{B}^2 = [\pi^2 \cdot r^4 \cdot f_1]^2 \quad \dots\dots(14)$$

3-e.. The Euler-Analysis of Motion in Orbits : Figure -9- 1,2,3 :

The Euler Vector equation of motion for a Rigid-Body is as below ,

$$J_1 [\bar{k} \frac{d^2 \bar{k}}{dt^2}] + J_3 w_3 \cdot \frac{d\bar{k}}{dt} + \bar{s}_o \cdot Q [\bar{k} \bar{k}'] = 0 \quad \dots\dots(15) \text{ where ,}$$

$J_1 , J_2 , J_3 \rightarrow$ Are the Moments of Inertia of Ellipsoid related to Principal axis .

$\bar{w} [w_1, w_2, w_3] \rightarrow$ Is the constant Angular-Velocity-Vector with respect to changes ,

$\bar{i} , \bar{j} , \bar{k} \rightarrow$ The Unit constant-vector of the moving Body-System . { the Origin }.

$\bar{i}', \bar{j}', \bar{k}' \rightarrow$ The Unit constant-vectors of Body-System .

$\bar{s}_o , \bar{s} , \rightarrow$ The Unit motion vector on the common section of Planes $i-j , i-k$.

$\phi , \theta , \psi \rightarrow$ The Three axial angles of vectors $\bar{i}', \bar{s}_o - \bar{i} , \bar{s}_o - \bar{k} \bar{k}'$

$Q \rightarrow$ The weight of the Rigid-Body = mg .

$\frac{d\phi}{dt} , \frac{d\theta}{dt} , \frac{d\psi}{dt} \rightarrow$ The Angular-velocities of angles , ϕ , θ , ψ ,

$\bar{B} [B_1 , B_2 , B_3] \equiv \bar{S} [S_1 , S_2 , S_3] \rightarrow$ The Angular-Momentum -Vector $\equiv$ Spin.

The Energy Relations :

$$\bar{B} = J_1 w_1 \bar{i} + J_2 w_2 \bar{j} + J_3 w_3 \bar{k} \quad \dots\dots\dots(16)$$

$$B^2 = J_1^2 w_1^2 + J_2^2 w_2^2 + J_3^2 w_3^2 \quad \dots\dots\dots(16a)$$

$$\bar{B}_w = Jw^2 (= 2L) = J_1^2 w_1^2 + J_2^2 w_2^2 + J_3^2 w_3^2 \rightarrow \text{Ellipsoid of Angular-velocity}$$

$$L = \frac{B_1^2}{2J_1} + \frac{B_2^2}{2J_2} + \frac{B_3^2}{2J_3} = \text{The Constant-Angular-velocity-momentum-Ellipsoid} \dots\dots(17)$$

i.e. $\rightarrow$ For any radius OP of $\bar{w}$ -vector exists another radius of $\bar{B}$ -vector Perpendicular

to , The $\bar{w}$ -edge Tangential-Plane of the Angular-Vector-Ellipsoid , and The $\bar{w}$ -vector

is Perpendicular to the $\bar{B}$ -edge Tangential-Plane of the Angular - Momentum-Vector

Ellipsoid . In case of Zero-Moment , related to the equilibrium Point O , then ,

The motion of a Solid Body is Identical to the Rolling of the PO- $\bar{w}$ - Vector-Ellipsoid

[OP] in **E-Tangential to Ellipsoid** [$\bar{B} = OT \perp E$] Vector . [70]

4-e.. : The Precession and Nutation of Electron :

Gravitational constant, G, is **The Pulling and Cohesive Force** on all the Quantized Energy-Structures which communicates with everything due to **Periodic excitation** on all Spaces. Newton's laws issues for masses and the same to Electrons in caves as below,

$$G \equiv g.k_E \equiv g \cdot [g_L k_L] \equiv \left[\frac{T^2 P}{a^3} \right] \cdot [g_L k_L] = 9,8078925 \cdot 6,8116 \cdot 10^{-12} \equiv 6,68056 \cdot 10^{-11} \frac{m^3}{Ns^2}$$

Electron being in Hydrogen-cave **Precesses because of the different axis of Rotation** and **Nutation's**, **from the immense-communication to gravity**, g.

Electron-Spin is the Angular-momentum-vector $\vec{B}$ and rotates according to equation $\frac{d\vec{B}}{dt} = [\vec{u}\vec{B}] = u \cdot B \cdot [\vec{k}\vec{k}']$ in Gravitational Potential $U_g = [mg] \cdot s \cdot \cos \theta = -sQ \cdot [\vec{k}\vec{k}']$, so the change of angular momentum $\vec{B}$ is

$$\rightarrow \frac{d\vec{B}}{dt} = u \cdot \frac{sQ}{B} = \frac{sQ}{J_3 \cdot w_3} \leftarrow \text{and from 1-degree equation of motion, } u, \text{ is } \ddot{u} + w^2 u = 0, \text{ and the solution}$$

$$\text{Period of Nutation } T = \frac{2\pi}{u} = \frac{2\pi J_3 w}{sQ}, \text{ and natural N-Frequency } f_N = \frac{sQ}{2\pi J_3 w} \dots\dots(1)$$

$$\text{with Total Energy of Nutation [70], } E_N = \frac{J_1}{2} [w_1^2 + w_2^2] + \frac{J_3}{2} w_3^2 \dots\dots(2)$$

For Material-Point, the chains of Spins due to Periodic excitation [$\leftrightarrow$] is created in **Orbit a Magnetic field** due to LRC-circuit and which is tuning to the critical Quantum critical-State g_C . **The Light velocity vector** $\vec{v} = \vec{c}$, by **Acting on cave**, $\vec{r} = \vec{L}_P$, finds the **Impedance** m_g , **becomes the Centrifugal-Force** F_g of Cave equal to **Gravity** g . The **chains of Spins** for the, ONE-WAY Pointy vibrating, is the Resonance -

Frequency $f_R = \frac{(1+\sqrt{5}) \cdot \sigma}{4\pi r}$ of vectors, c and $\vec{B}$ of the-Stationary-Photon-cave, where $\vec{B} \equiv \vec{S} \equiv \text{Spin}$.

The Moving Electron in Orbit of charge $\bar{q} \equiv \ominus$ with the **Orbit-Velocity -Vector** $\vec{v} = \sqrt{\frac{2}{m} [E - \{ \frac{k}{r} + \frac{L^2}{2mr^2} \}]}$

which **creates IN Orbit**, $\vec{r}$, the Varying and Perpendicular Magnetic-Field $\vec{B}$, which in time-turn **Creates** an Electric-field $\vec{E} \perp \vec{B}$, with the Resultant force $\vec{F}$ acting on Electron Velocity $\vec{v}$ and which is composed of $\vec{V}_P$, Perpendicular to the Magnetic-circles $\vec{O} \perp \vec{B}$, and $\vec{V}_V$, Parallel to the Magnetic-field-Vector $|\vec{B}|$, is tending such way that $L \equiv S \equiv \text{Spin}$. The resulting motion of Electron is the Helical motion.

Since **Work** is **Produced** during motion, The **Conservation exist in Orbit**, Protons and Electrons [$p \leftrightarrow e$], so the **Orbit occupies Energy as frequency quite differing that of those of Energy-levels**. Since frequency $f_N = f_R = 2,8398447 \cdot 10^{10} \text{ s}^{-1}$ {C-5} and exists in all Atoms, **due to the Hydrogen first cave**, then is the **Resonance-frequency** between all **Atoms and Molecules**.

Energy from equation $E = h \cdot f_N = 6,62607 \cdot 10^{-34} \cdot 2,8398447 \cdot 10^{10} = 18,817009 \cdot 10^{-24} \text{ J} / (1,6 \cdot 10^{-19}) = 1,174463 \cdot 10^{-4} \text{ eV}$, is conserved as **Thermal-Energy** E_T in kilo Cal and is continually increasing as, $E_T = 18,817009 \cdot 10^{-24} \text{ J} / [(4,19 \cdot 10^3) = \text{kcal}] = 4,49093 \cdot 10^{-27} \text{ kcal}$. This happens because of the closed Energy-Orbit-Rims, $\vec{r}$, and of the constant light velocity c , and from **Spin** equation $S = r m c$. Taking into consideration the Thermal - Energy of a Photon when it is pressing 1 m2 surface for 60s which is $\rightarrow E_P = 20 \text{ kcal} = 20 \cdot (4,19 \cdot 10^3) = 8,3777 \cdot 10^4 \text{ J}$, then the ratio, $[E_T / E_P] = 4,49093 \cdot 10^{-27} / 20 = 2,24546 \cdot 10^{-28}$, which is a Quantity **Not-detected**.

Hydrogen caves created in Sun **1 Million-years-ago** = $10^6 \cdot 365 \cdot 24 \cdot 3600 = 3,1538 \cdot 10^{13} \text{ sec}$, is accumulated Thermal-Energy of $E_T = 3,1538 \cdot 10^{13} \cdot 4,49093 \cdot 10^{-27} = 1,41625 \cdot 10^{-13} \text{ kcal}$, i.e.

The Stationary Hydrogen-wave-cave needs 1-Quadrillion years to conserve 1-kcal Thermal-Energy. For Half-frequency $f_R / 2 = 1,4199223 \cdot 10^{10} \text{ s}^{-1}$, the Kinetic Energy is Zero and the Potential-Energy is $U = E = h f = 6,62606957 \cdot 10^{-34} \cdot 1,4199223 \cdot 10^{10} = 9,4 \cdot 10^{-24} \text{ J} = 5,8722 \cdot 10^{10} \text{ eV}$, which agree with the Bohr-Magneton.

The Produced-Work in Orbit as Frequency $f_N = \frac{sQ}{2\pi J_3 w} = 2,8398447 \cdot 10^{10} \text{ s}^{-1}$ and is Constant

which is **Conserved**. Because of the **Magnetic-field created On - Orbit**, and **Applied At the Nucleus with the same Effect then**, exists **LARMOR - Equation** as $w_0 = \gamma \cdot \beta_0 / 2\pi$, and for Hydrogen cave at 1,5 Tesla Magnet, $\gamma = 2,675 \cdot 10^8 / \text{sT}$, $\beta_0 = 1,5 \text{ T}$, then angular velocity $w = 63,864 \text{ MHz} = 63,864 \cdot 10^8 \text{ Hz}$, and a frequency $f_N = 2\pi \cdot w = 4,012575 \cdot 10^{10} \text{ s}^{-1}$.

Remarks :

- 1.. Since the frequency created from Electron-Nutation is on the Basic, **first**, Orbit of Atoms, therefore allows the **Resonance-frequency** between all **Atoms, Molecules**, for their Bonding and others.
- 2.. Since Electron is continually-oscillating with the Nutation-frequency f_N , so Produces an oscillating Magnetic-field -M- which in turn is the source of an oscillating Electric-field -E-, which implies the **Regeneration each other**, i.e. a **Propagating Electromagnetic-Wave** where $E = B \cdot c$. In an constant lag of Time, then This is a **Way of Information and Storage in Nature**, and this may be used in medicine.
- 3.. Since Resonance-frequency is IN the first Orbit of Atoms, therefore allows Electromagnetic-Wave **to get out the Atoms-cave**, with a quantum-Energy $E = h f_N$ or $E = 2\mu \cdot B$, which may be controlled.

4.. Since Electron is rotating in Orbits so Electromagnetic Wave is also rotating , therefore is needed a **Proper-Stationary-Magnet** on which Rotation becomes Oscillation in order to succeed a clear 3-dimensioned , Φ^3 , Magnetic-Resonance-Imaging [The MRI] and the other Systems using this Property of Bottom-Information . This Property of Spin in all depths of Energy-caves allows the Granularity of Energy in Energy-loops , and after to be Bonded .This Property may be used for **Cancer Chromosomes**.

5-e.. The Spin , and Magnetic-moment Relation-Analogous .

- 1.. Magnetic Dipole - moment ($\bar{\mu}$) , or **the Torque on a current loop , is a Vector** - quantity arising from the rotation of a **current (I)** in a circular loop of **radius , r** , and of an area $A = \pi r^2$.
- 2,, **Angular-momentum-Vector** becomes from the **Eternal-Rotation** of the $\ominus$ constituent around the $\oplus$ **constituent in a cave** of **radius , r** , and area $A = \pi r^2$.

i.e. The Phenomenon , or $\equiv$ The Same-Vector , is measured Electrically and Mechanically .

The magnetic moment generated by an circular current is the **current times the area of circle**. Its direction is perpendicular to the area , A , and is determined by the right-hand rule and is ,

$$\text{Magnetic - moment .} \quad \bar{\mu} = I \cdot A \quad \dots\dots\dots(a)$$

From material Point ([86].P-48) $2L \equiv \bar{B}\bar{w} \equiv h \cdot f$, $|w| = \frac{\sigma}{2r} [1 + \sqrt{5}]$, and $f = \frac{(1 + \sqrt{5}) \cdot \sigma}{4\pi r}$

$$\text{Angular momentum } \bar{B} = \frac{2L}{\bar{w}} = \frac{2L}{2\pi f} = \left[\frac{L}{\pi} \right] \cdot \left[\frac{1}{f} \right] = \frac{4r \cdot L}{(1 + \sqrt{5}) \cdot \sigma} = [\pi r^3 \sigma (1 + \sqrt{5}) / 2] = \frac{\pi^2 r^4 \cdot f}{2} \quad \dots\dots(b)$$

From (a) , (b) the Angular - velocity - Ellipsoid , $\bar{w}$, is the analogous to the circular current , I , and Angular -Momentum-Ellipsoid $\bar{B}$, is the analogous to the Torque , $\bar{\mu}$, on this circular loop so $\bar{\mu} = I \cdot A$

$$= \frac{\text{Energy=Motion}}{\text{Unit-Time}} = \frac{I \cdot A \cdot s}{s} = \bar{B} = \frac{2L}{\bar{w}} = \frac{2L}{2\pi f} = \left[\frac{L}{\pi} \right] \cdot \left[\frac{1}{f} \right] = \frac{4r \cdot (hf)}{(1 + \sqrt{5}) \cdot \sigma} = \left[\frac{h}{2\pi} \right] = \text{SPIN} \quad \dots\dots(c) \quad \text{i.e.}$$

The Magnetic - moment $\bar{\mu}$ of the Material - Point = $\left[\frac{h}{2\pi} \right] \equiv \text{SPIN}$, and also equal to

$$\text{the Angular-Momentum-Vector } \bar{B} = \pi^2 \cdot r^4 \cdot f = \frac{\pi^3 \sigma}{2} [1 + \sqrt{5}] \equiv \pi r^3 \cdot \sigma \Phi \equiv \left[\frac{h}{2\pi} \right] \equiv \frac{2L}{2\pi f} .$$

The effect of Magnetic-moment on an **External Magnetic field** $\bar{P}$ is the Torque acting on the Dipole $\bar{\tau} = \bar{\mu} \times \bar{P}$ representing the lowest Energy configuration , and has a Potential - Energy $U = - \bar{\mu} \cdot \bar{P}$ with Force in the loop $\rightarrow F_{\text{loop}} = \nabla(\bar{\mu} \cdot \bar{P})$, and for Dipole $\rightarrow F_{\text{dipole}} = (\bar{\mu} \cdot \nabla) \cdot \bar{P}$, or $\rightarrow F_{\text{loop}} = F_{\text{dipole}} + \bar{\mu} \cdot [\nabla \times \bar{P}]$.

The Potential-Energy associated with the magnetic moment is $U = - \bar{\mu} \cdot \bar{P}$ so that the difference in Energy Aligned and Anti-aligned is $\Delta U = 2 \bar{\mu} \cdot \bar{P}$. From Physics , The intrinsic magnetic moment , $\bar{\mu} = \frac{g_s \cdot q}{2m} \cdot S$, where

g_s = a dimension-less Quantity q = the charge , m = the mass ,

S = the Spin of Particles and from (c) , Angular-momentum $L = B w / 2$, and since $B = S$ then ,

$$\bar{\mu}_{\text{intrinsic}} = \frac{4r \cdot L}{(1 + \sqrt{5}) \cdot \sigma} = \frac{2wr \cdot B}{(1 + \sqrt{5}) \cdot \sigma} \quad \text{and} \quad \bar{\mu} = \frac{g_s \cdot q}{2m} \cdot S, \text{ or } g_s = 2 \left(\frac{m \cdot \bar{\mu}}{q \cdot S} \right) , \text{ and because charge } q \text{ is equivalent to}$$

$$\text{Angular-velocity-Vector , } \bar{w} , \text{ then } g_s = 2 \cdot \left(\frac{m \cdot \bar{\mu}}{w \cdot S} \right) = 2 \cdot \left[\frac{m \cdot (\bar{\mu} = 2L)}{w \cdot (S = 2L)} \right] \quad \dots(d)$$

i.e. Dimensionless quantity g_s , is related to $\rightarrow$ mass m , charge q , Spin S , and the Intrinsic Magnetic moment $\bar{\mu}$, is analogous to mass m , the Angular velocity w , and the Glue-bond σ of the cave .

This Intrinsic Angular-Velocity $\bar{w}$, of the Material-Point allows Spin S , to be quantized as to Straightly in Great-circles , $[Spin = \pm 1]$ by rotation Up or Down to the circles , **either** is anticlockwise in Left-Small-circle , $[S = -1]$, by rotation Up or Down to the circles , **or** is clockwise in the Right-Small-circle $[S = +1]$ by rotation Up or Down to the circles . All particles Fermions or Bosons are becoming from above three states just

by Adding the Spins , so **Complex-Structure** would have a **Spin of** , $-\frac{1}{2}$, 1 , $+\frac{1}{2}$, **or** $+\frac{1}{2}$, -1 , $-\frac{1}{2}$, **only** .

The Specific Rotational velocity $v = w r = |w| r = \frac{\sigma}{2r} [1 + \sqrt{5}] \cdot r = \frac{\sigma}{2} [1 + \sqrt{5}] = \sigma \Phi$, is related to Glue-bond , σ only , meaning , **The Granularity of Spin in all depths of Energy-caves** .

The nature of , + Spin , is exactly the same to , - Spin , because is the Angular-momentum Vector $\bar{B}$ of any two Opposite direction and has nothing to do with Spinors . [35-36]

Space is a Quaternion , having discrete Quantized Energy boundaries those of the two , $(\oplus)$, $(\ominus)$, constituents eternally rolling on Great or Small circles and accordingly , Clockwise or Anticlockwise Originating the $\pm$ Spin or $(+)$, $(-)$ Spin and is the first Quantized - Energy - monad . Charge in Physics is the Physical Properties of matter that **Causes** it to experience a **Force** when Placed in an Electromagnetic-field , **In contrast to Material-Point** , where Force , $\bar{B}$, is originated **From the Glue-bond** , $\pm \sigma$, of any two Opposite-Constituents in Energy-caves . Since current , I , is the net outward current through a closed surface and , $\bar{q}$, is the Electric-Charge contained within the volume defined by the surface , then Electric-charge is equivalent to the Magnetic moment , or $\bar{q} \equiv \bar{\mu}$, and current equivalent to angular velocity , or $I \equiv w$.

Mass in Physics is a property of a Physical-Body , and it is a measure of an object's

Resistance to the acceleration , a change in its state of motion when a net force is applied ,

while in , **Material-Point** , from its **Angular acceleration** , $a_a = \frac{\bar{B} \times \bar{w}}{J}$, where

$J = \frac{\pi r^4}{2}$ = The Polar moment of inertia and from Newton equation $2E = m \cdot a_a$ then , $m = \frac{2E}{a_a} =$

$[\frac{\bar{B} \cdot \bar{w}}{\bar{B} \times \bar{w}}]$. J is the reaction to Angular-velocity-changes in direction , a Scalar magnitude ,

and since Inertial mass is equal to Gravitational mass then , Mass of Material - Point equals

to , $m = \frac{2E}{a_a} = [\frac{\bar{B} \cdot \bar{w}}{\bar{B} \times \bar{w}}] \cdot J \equiv$ **a number measuring Energy-quantities in caves** .

For an inclination of 45° then the Dot-Product of $\bar{B} \cdot \bar{w}$ is $\rightarrow |\bar{B}| \cdot |\bar{w}| = |\bar{B}| \cdot |\bar{w}| \cdot \cos 45^\circ$ and the Cross Product of $\bar{B} \times \bar{w}$ is $\rightarrow |\bar{B}| \times |\bar{w}| = |\bar{B}| \times |\bar{w}| \cdot \sin 45^\circ$ equal to Dot Product , and In Planck's-length - cave , $r = 4,453 \cdot 10^{-35}$ then mass becomes $\rightarrow m = \frac{1}{1} \cdot J = \frac{\pi r^4}{2} = 617,63 \cdot 10^{-140} = 6,1763 \cdot 10^{-138}$ Kg , and

The Ellipsoid of Angular-velocity remaining $\frac{w_1^2}{2} + \frac{w_2^2}{2} + \frac{w_3^2}{1} = \frac{2L}{J_3}$

Since also $w = \frac{v}{r}$, and since in small circles the radius $R < r$, the radius of the Great circles then , Angular velocity Vector and frequency increases while Period , T , decreases . This Precession in Material-Point is the analogous to Nutation of Earth and other Planets indicating the relation of Microcosm and the Macrocosm to the same laws of Mechanics .The decreasing of , **Time T** , may be used for Anti-Cancer Process as $v = 2\pi r/T$.

From equation $\bar{B} = r m v = m r w r = m \cdot w \cdot r^2$, **mass m** = $\frac{\bar{B}}{w r^2} = \frac{2 \cdot B}{\sigma \cdot r(1 + \sqrt{5})} = [\frac{1}{2\pi f}] \frac{\bar{B}}{r} = \frac{1}{w} \frac{\bar{B}}{r}$

= $\frac{2E}{r}$ or $\rightarrow m = \frac{2E}{r}$, and $E = \frac{B}{2c} \dots [m]$ **denoting The Unification of Energy Mass and Cave r** .

$[m]$ is **The mass of Material-Point related to Any cave , r** , and $\pm \sigma$, its Principal Stresses.

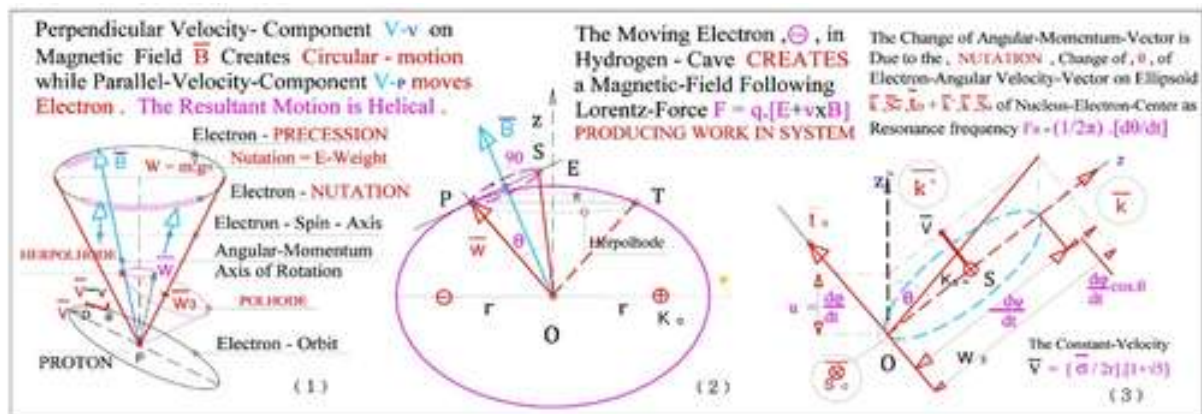
All **Energy-levels follow The Kepler-Space-Grainy-relation** $f_n^2 a^3 = k =$ **Quantum-of motion**.

Applying above to Under Planck's length (that what prior called Virtual Particle or Fields of Antiparticle-Pairs { The Spin $\equiv$ the Angular-Momentum-Vector $\bar{B}$, in the Self rotating Material-Point $[+s^2 \leftrightarrow -s^2]$ } $\rightarrow$ explains **The Why Galaxies** , and the clusters of Galaxies **remain stable** .In Caves of $(\oplus \equiv +s^2)$, $(\ominus \equiv -s^2)$ Emerge-Spin as Automobile - Force is **Vacuum-Energy** which was Prior analyzed . The Gravity-length-cave $r = 3,969 \cdot 10^{-62}$ and mass becomes $\rightarrow m = \frac{1}{1} \cdot J = \frac{\pi r^4}{2} = 389,80218 \cdot 10^{-248} = 3,898 \cdot 10^{-246}$ Kg .

For **Dual -Photon** $\{\bar{c} \cdot \bar{f}_n + \bar{c} \cdot f_n\} = \bar{c} \cdot \bar{f}_n + \bar{c} \cdot f_n = \bar{c} \cdot (m_1) + \bar{c} \cdot (m_2) = \{M_T \cdot \bar{c}\}$, where Complex-Impedance is $\rightarrow M_T = \sqrt{m_1^2 + [L_2 - C_2]^2}$ and Complex-frequency $w^2 = L_2 \cdot C_2 = 4 \cdot \pi^2 \cdot f_n^2$.

In (1) is shown the Stationary 2D-Space-Part which is **The-Strain-Fringe-Pattern** and is The **PARTICLE Photon** $\bar{c} \cdot \bar{f}_n \leftarrow$ or $\bar{c} \cdot \bar{f}_n = w r f_1 \equiv \sigma \Phi \cdot f_1$, i.e. The Geometry , **The Shape** of the Fringe-Pattern .

In (2) is shown the Changeable 2D -**Energy-Part** which is **The-Stress-Fringe-Pattern** and is the **WAVE Photon** $\rightarrow \bar{c} \cdot f_n \leftarrow$ or $\bar{c} \cdot f_n = c \cdot c f_n \equiv c \cdot \sigma \Phi \cdot f_1$, i.e. The movable and of Changeable-Colors , **In the Shape** , of the Stationary-Fringe-Pattern .



6-e.. Atoms Precession and Energy Vectors :

Figure – 9 - : The Electron's Nutation in Precession :

In (1) **The Electron-motion creates a Magnetic-Field $\bar{B}$, in which is Stored Work** . { Electron Velocity Vector V_e is composed of the V_{-v} Perpendicular- constituent which stores motion in circular-Helix-paths and the Parallel- constituent V_{-p} constituent which is Pushing the Energy-circles along a straight line }.

In (2) **The Angular Momentum-Vector $\bar{B}$, and the Angular-Velocity-Vectors $\bar{w}$, of Electron at Point P and Proton at Point O , are Perpendicular each other and forming the Herpolhode , $OPT \perp OB$, where for the Polhode issues $PS \perp OP$, Perpendicular to Ellipsoid .**

In (3) **The Change of Angular Momentum vector**, $\vec{B}$, is Due to the change of θ angle,

Nutation, and the Produced Work is Stored in the **Nucleus-Electron-Orbit-Slim**.

Electron Precession is the (change of ϕ) of Angular velocity while **Electron-Nutation** is the change of angle θ .

Precession is the change in ϕ , while Nutation is the change in θ . For $w_3 = \text{constant}$ then $\frac{d\phi}{dt} = \frac{d\psi}{dt} = \text{constant}$ and angular velocity $w = \vec{k} \frac{d\phi}{dt} + \vec{k} \frac{d\psi}{dt}$ in the $\vec{k} \vec{k}'$ Plane.

After some operations results the equation of motion under above restrictions as,

$$J_1 \cdot u^2 \cdot \cos \theta - J_3 \cdot w_3 \cdot u + sQ = 0 \dots (1) \text{ where } u = \frac{d\phi}{dt} = \frac{dB}{dt}, \text{ with solution } u = \frac{J_3 \cdot w_3}{2J_1 \cdot \cos \theta} \pm \sqrt{\left[\frac{J_3 \cdot w_3}{2J_1 \cdot \cos \theta} \right]^2 - \frac{sQ}{J_1 \cdot \cos \theta}} \dots (2)$$

Displacement, u , is called $\rightarrow$ **The Regular Precession of the Rigid-Body** $\leftarrow$

The under root terms are > 0 when $\frac{sQ}{J_1 \cdot \cos \theta}$ is very small or when Angular velocity $w \cong w_3$ where, angular velocity axis is very closed to the Principal Ellipsoid axis. The change of Angular-momentum is

$$d\vec{B} = M \cdot dt = [\vec{s}_0 \cdot Q] dt = sQ \cdot [\vec{k} \vec{k}'] dt \dots \dots \dots (3)$$

where Kinetic Energy during a displacement $2s$, is not changing, while Angular-velocity Vector $\vec{w}$, is placed around $\vec{B}$, for which Moment of Inertia Ellipsoid executes a circular Polhode. The moving Inertia is rolling On the steady cone, driving in Precession the Electron-Spin-axis. Since vectors $\vec{B}$, $\vec{w}$, are very closed each other and to symmetric axis $\vec{k}$, **Polhode** are narrow closed loop-curves on Poisson-Plane around $\vec{B}$ Vector. The Angular-momentum-vector $\vec{B}$ rotates according to equation,

$\frac{dB}{dt} = [\vec{u} \vec{B}] = uB \cdot [\vec{k} \vec{k}']$, in Gravitational Potential $U_g = [mg] \cdot s \cdot \cos \theta = -sQ \cdot [\vec{k} \vec{k}']$, so the change of $\vec{B}$ is $\rightarrow \frac{dB}{dt} = u = \frac{sQ}{B} = \frac{sQ}{J_3 \cdot w_3}$ and from the 1-degree equation of motion, $\ddot{u} + w^2 u = 0$, then issues,

$$\text{Period of Nutation } T = \frac{2\pi}{u} = \frac{2\pi \cdot J_3 w}{sQ}, \text{ and Frequency } f_N = \frac{sQ}{2\pi \cdot J_3 w} \dots \dots \dots (4)$$

Total Energy of Nutation $E_N = \frac{J_1}{2} [w_1^2 + w_2^2] + \frac{J_3}{2} w_3^2$ or in Euler angles

$$E_N = \frac{J_1}{2} [\dot{\theta}^2 + \dot{\phi}^2 \sin^2 \theta] + \frac{J_3}{2} [\dot{\psi} + \dot{\phi} \cos \theta]^2 \dots \dots \dots (5)$$

An Example :

The Electron radius $s = r_e = 5,82 \cdot 10^{-16} \text{ m}$,

Weight of Electron $Q = m_e g = 9,11 \cdot 10^{-31} \cdot 9,808 = 8,93 \cdot 10^{-30} \text{ Kg}$,

Moment of Inertia-Disk $J_e = J_3 = [\pi a^4/2] = \pi/2 [5,8 \cdot 10^{-16}]^4 = 1,777591 \cdot 10^{-61} \text{ m}^4$,

Angular velocity $w_e = \frac{v}{r_N} = \frac{c}{1836} = \frac{3 \cdot 10^8}{1836} = 1,633 \cdot 10^5 \text{ m/s}$ because of masses analogy

$$\text{The-Electron-Nutation-frequency } f_N = \frac{sQ}{2\pi \cdot J_3 w} = \frac{5,82 \cdot 10^{-16} \cdot 8,93 \cdot 10^{-30}}{2\pi \cdot 1,777591 \cdot 10^{-61} \cdot 1,633 \cdot 10^5} = f_N = f_R = 2,8398447 \cdot 10^{10} \text{ s}^{-1} \dots \dots \dots (6)$$

From equation (5) is seen, The moving Electron [$\ominus$ charge] creates a Magnetic-field which **Changes** from Total-Kinetic-energy $E = T_K + L$, where $L = S = \text{Spin}$. What this means ?? The Answer,

Work is continually created as Resonance-Frequency $f_R = f_N$. Since in Universe exist only **Motion**, and The meaning of Work is $\rightarrow$ **Energy $\equiv$ Force x Displacement**, therefore the continually-Moving Electron **Carries this** $\rightarrow$ [Motion-Box]. How ???

To exist Work $\equiv$ Energy are needed Two things, **The One is the Force to be confined** in a [Motion-Box] and the **Second is the Force which is Pushing this [Motion-Box with the before confined motion]**.

The Photon, **In-Planck's-length**, occupies velocity equation $\vec{v}_f = \vec{c} \cdot \{ \vec{f}_n + \vec{f}_n \}$ where $\vec{f}_n \equiv$ Motion-Box

In Photon, [Motion-Box], are the n , frequencies. The moving Electron-Vector-components $\vec{v}_e = \vec{v}_{e\uparrow} + \vec{v}_{e\rightarrow}$ are composed of Two-velocity components, the One is the Perpendicular $\uparrow$ and the Other is the Parallel $\rightarrow$ to Motion Box where the **First CARRIES the Outside-Motion Into the [Motion-Box]**, and the Second **velocity component PUSHES the Motion-Box**, Figure -10- as

1.. The [Motion Box] which carries, **The Motion** $\vec{v} \equiv \vec{r}'$, are **The Magnetic-field-lines** which are circles in field filled with motion $\equiv$ transportation $\equiv$ Spinning $\equiv$ Tension. The velocity-component, $\vec{v}_{e\uparrow}$, being Perpendicular to Magnetic-lines creates Energy-Circles and thus, Motion $\equiv$ Work $\equiv$ Energy, is **Carried in The Magnet-Box**.

2.. **The Pushing velocity-Force** on this [Magnet-Box] $\equiv$ **The Velocity-Vector-Force** which is Perpendicular to the Magnetic-field-lines-Plane, and which carries the [Magnet-Box] along a straight line with horizontal distance, *the pitches*, between Two consecutive circles $\vec{v}_{e\rightarrow}$. The Resulting Helical motion is the Propagated Energy. The difference between the Potential-Energy of the Orbit and that of the Electron Nutation in the Precession with the **Lowest-Potential-Energy**, is the Resonance-Frequency. The analogous is in Electrical Circuits where, When **A circuit is Driven to Oscillate at its Natural frequency**, f_N , Either by storing in it

Electrical-Energy Or by Charging its Capacitor. The Cyclotron frequency $f_N = \frac{sQ}{2\pi \cdot J_3 w} = \frac{qB}{2\pi \cdot m}$ is free, i.e.

Frequency is Independent of Velocities . issuing in **Propagating-Electromagnetic-Wave**.

The [Magnetic-Fields] $\equiv \bar{c} \cdot \{ \bar{f}_n \} \equiv$ [Energy-Baskets] is the Way for Energy-Propagation as ,
 Strength-field $\bar{B}_F = [\frac{2\pi \cdot m \cdot T}{q_T}]$, $f \equiv \bar{B} \equiv \frac{\pi \cdot \Phi \cdot \sigma}{4}$, and as Wave $\equiv \bar{c} \{ f_n \} \equiv \{ [eE^2 + \mu B^2] = 2 \cdot \lambda \cdot c \cdot \sin [\frac{2\pi c}{\lambda}] \}$,
 where $\bar{w} = 2\pi f = \frac{S_p}{m}$, issuing that it is the Tangent of Ellipsoid $\rightarrow \bar{B} \perp \bar{w}$ Vector $\leftarrow$ and Tangent of
 $\bar{w}$ Ellipsoid as $\rightarrow \bar{w} \perp \bar{B}$ Vector . It is a relation $\{ \perp \}$ between Angular and Momentum Ellipsoids .

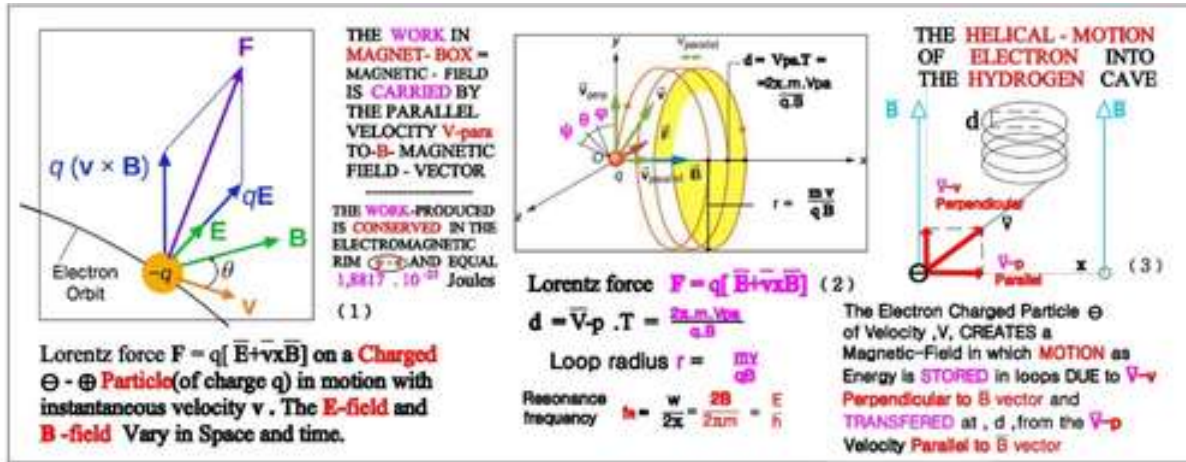


Figure -10- : The How moving-Electrons creates Electromagnetic-Wave and Propagates.

In (1) , The Moving Electron of charge $\bar{q} \equiv \ominus$ mass m , with the **Orbit-Velocity-Vector $\bar{v}$** , as

$\bar{v} = \sqrt{\frac{2}{m} [E - \{ \frac{k}{r} + \frac{L^2}{2mr^2} \}]}$, **Creates IN Orbit , r** , the Varying Perpendicular Magnetic-Field , $\bar{B}$, which in time-turn **Creates** an Electric-field , $\bar{E}$, which is Perpendicular to $\bar{B}$, with Resultant force F , acting on Electron . Velocity $\bar{v}$ is composed of V_p , Perpendicular to the Magnetic circles $O \perp B$, and V_v , Parallel to the Magnetic-field-Vector B tending to , $L \equiv S \equiv$ Spin .The resulting motion of Electron is the Helical-motion.

In (2) , The changing Electron-velocity-Vector , $\bar{v} = \sqrt{\frac{2}{m} [E - \{ \frac{k}{r} + \frac{L^2}{2mr^2} \}]}$, **Creates** the Perpendicular Magnetic-Field $\bar{B}$, which Magnetic-lines are the Energy circles O in B , *Due to the velocity-constituent V_p* , which is Perpendicular to Magnetic lines O . The velocity-constituent V_v is Perpendicular to the , **Plane of Circles - O** , and Pushes O -Plane along a straight line forming thus , the **Helical motion of Electron** .

Because of the Orbit- Magnetic-Field $\bar{B}$, **Property** answers the **Zeeman effect** .

In (3) , The Moving Electron of charge $\bar{q} \equiv \ominus$, with the Energy in the **Orbit-Velocity-Vector $\bar{v}$** ,

$\bar{v} = \sqrt{\frac{2}{m} [E - \{ \frac{k}{r} + \frac{L^2}{2mr^2} \}]}$, is forming angle $< \theta$ with $\bar{B}$ Vector , **Creates IN ORBIT , r** , the Perpendicular Magnetic-Field $\bar{B}$, which Magnetic-lines are the Energy circles , O in B , *Due to the velocity-constituent V_p* , Perpendicular to Magnetic-circles O . The velocity - constituent V_v is Perpendicular to the , **Plane of Magnetic Circles - O** , and Pushes the O -Plane along a straight line . i.e. $\rightarrow$ **The Magnetic-Field is the Store of Energy** . The continuous change of direction of the Electron **Orbit-Velocity-Vector $\bar{v}$** , related to $L \equiv S \equiv$ Spin , Creates the Base of Propagation of it in Hydrogen - Orbit by using the Electromagnetic-Wave , E, B , as an Energy Transported-Box . Because during motion the **Produced-Work** , is **Conserved in Orbit** so , Orbit occupies Energy as frequency differing that of Energy-levels . i.e. The **Energy $\equiv$ motion** Propagates , *travels* , as **Magnetic-Field $\bar{B}$** . which is the Box , and as **Electric-Field $\bar{E}$** , which is **The Thrust** of the Box .

Since this frequency $f_N = f_R = 2,8398447 \cdot 10^{10} s^{-1}$ exists in all Atoms , it is The **Resonance frequency** between All , **Atoms and Molecules** , in this Cosmos . For Half-frequency $f_R/2 = 1,4199223 \cdot 10^{10} s^{-1}$ then the Kinetic Energy is zero and Potential-Energy is as , $U = E = h f = 6,62606957 \cdot 10^{-34} \cdot 1,4199223 \cdot 10^{10} = 9,4 \cdot 10^{-24} J = 5,8722 \cdot 10^{10} eV$, which agrees with $\rightarrow$ Bohr-Magneton .

Because the Magnetic-field is created On-Orbit and Applied At-Nucleus with the same Effect , then exists **LARMOR - Equation** as , $w_0 = \gamma \cdot \beta_0 / 2\pi$, and for the Hydrogen at 1,5 Tesla Magnet $\gamma = 2,675 \cdot 10^8 / sT$, $\beta_0 = 1,5 T$, then $w_0 = 63,864 MHz = 63,864 \cdot 10^9 Hz$, frequency $f_N = w/2\pi = 1,016457 \cdot 10^{10} s^{-1}$ or is , **The Communication-Tool , The Identity-Card** between all Atoms relations.

From Orbit-equation , $\bar{v} = \sqrt{\frac{2}{m} [E - \{ \frac{k}{r} + \frac{S^2}{2mr^2} \}]}$ and for $v = 0$ then $E = \{ \frac{k}{r} + \frac{S^2}{2mr^2} \}$ and

for $r_p = L^2 / [GM m^2] = S^2 / m^2 GM$ then $E = \left\{ \frac{kGMm^2}{L^2} + \frac{S^2}{2mr^2} \right\} = \left[\frac{kGMm^2}{S^2} + \frac{m[GMm]^2}{2S^2} \right]$, and
 Energy $E = \left[\frac{GMm^2}{2S^2} \right] \cdot [2k + GMm] \equiv \frac{k_0}{2S^2} \equiv \text{Constant}$ and **Halve-Spin-Inverse-Squared**,
 The Total-Energy for moving-caves is $E_K = \frac{1}{ar^2} \left[\frac{4\pi^2}{c^2} + \frac{ah.c.S_T}{2} \right]$ in Joules (1J = 1N.1m)
i.e. Energy $\equiv$ motion, And is transported in Caves as their **Spin-Position**, S ,
 which thus, defines The Identity of Orbits in all Atoms and Molecules.

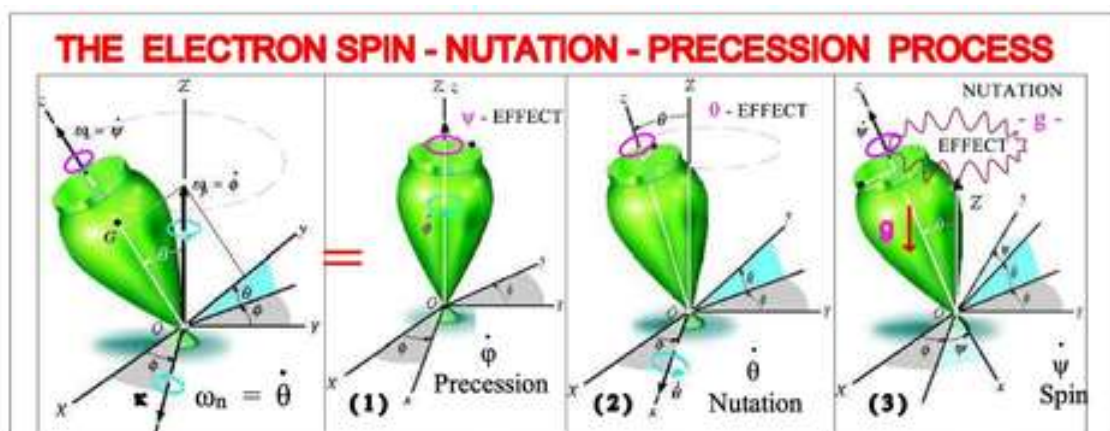


Figure - 11 - The Effect of Gravity, g , on Electron-mass Originates Electron-Nutation.

θ , in **Electron-Precession**, ϕ , and changes **Electron-Spin-Direction**, ψ .

The **Produced-Energy** is stored in Magnetic – field $\bar{B}_p = 2\pi \cdot m_p \cdot f_r / \bar{q}_p$

The Data In A - Cave -Site :

- Spin** is a **Couple of Forces** $[+F, -F]$ following the Vectors Rules . Figure-10,12-
- Electron** [of – Charge] moving in Orbit around the Nucleus creates a **Magnetic - Field** tilted to Electron's - Spin $[M_O = S_O]$, therefore it's **tilted axis Precesses**.
- Nucleus-Spin-axis is tilted with Orbit's-Spin-axis ,but because the two free-Couple Vectors $[M_N = S_N$ and $M_O = S_O]$ may be resolved into component vectors and the **Resultant** M_T , which is the **Diagonal** (Magnitude) of the **Parallelogram** with sides equal to S_N, S_O , **Changes**, according to their Rotation axis with an angle, $d\psi$. Fig-13
 At **Nutation-Period**, M_O is **Swinging** in circular-Magnetic field and angle, θ , **Decreases**, so the **Diagonal Spin-Resultant** $M_T = S_N + S_O$ **Increases** and the Produced Energy is supplied into the nearest Precession-frequency-System which is the classical Current-loop of masses, [The, m_N, m_O **Current-loop**] $\equiv$ The **Energy-Proton-Cantilever-Vector**, or the $\rightarrow$ **Hydrogen-Bracket N-O** $\leftarrow$
- Gravitation-Force through Gravity is continually acting on the Orbit-Electron-Spin.
 The tilted axis of **Electron-Spin precesses** by changing the Direction of N-O lever-arm, **from the Nutation of Precession in the Magnetic-field** due to the **Negative, -, Charge**, and from the tilted axis of **Nucleus-Spin** which **continually precesses** in the Magnetic field. **The produced Energy as Resonance frequency f_R is added in N - O loop or in** $\rightarrow$ [The m_N, m_O **Current-Potential-loop** $E = U(x)$] as before.
- In **Hydrogen-Atom's case**, **The transferred-Energy in Current-loop N-O**, is that of **Electron-motion** with light velocity in the **circular-Magnetic-field-lines** which are **Perpendicular to the Orbit**. This Magnetic-field is related to, m, q, f . units.

The **Direction**, $x-x$, of the two **Couples of Oscillation** is that of the two masses as are $\rightarrow m_N, m_O \equiv e$ of **Current-loop** which is continually altered because of the **Polhode curve** as in Fig- 9 . Since the Total Angular Momentum $M_T = M_N + M_O$ where $M_T = L = S = I \times \omega$, and is **Swinging** on the **Precession-circle** and **w-Nib on Polhode curve**, therefore the **Resultant** M_T , Resonates with the Quantum frequency f_R of the cave to form with $\pm q$ Charges the Magnetic Field $\bar{B}_R$. At Nutation - Period, M_O is **Swinging** and angle θ , **Decreases or Increases**, so the **Diagonal-Resultant** M_T **Increases or Decreases** and the Energy is transferred in $\rightarrow [m_N, m_O$ **Current-Potential-loop** $U(x) \equiv$ The-Proton--Vector-Bracket], since $K_E = 0$. The Bound states of the Hydrogen have **Negative Energies** because Proton and Electron can never become infinitely-distance.
Kinetic-Energy K_E , is supplied in the form of a **Rotating-Nucleus-Magnetic field** IN ORBIT- RIM N-O, which is applied for a short time in Plane $\perp$ to the variated $\bar{R}$ vector and which is rotating very near to the **Resonance** (precession) frequency of the Nucleus Protons . $[m_N, m_O \equiv e$ **Current-loop Increases** its $P_E \equiv U(x)$]. This ORBIT-RIM is $\rightarrow$ the **Nucleus-Orbit Vector-Bracket** $\leftarrow$ **Oriented in Spin axis**. The **Energy-Nucleus-Orbit-Vector-Bracket**, of **The-One-Proton-Atom** issues and for the multi Proton and Electrons in Orbits and the variated vector $\bar{R}$ as in (1a).

Remark - 1 :

Hydrogen Atom with One **Nucleus** of Spin $\{+\frac{1}{2}\}$ and one **Electron** in Energy-Orbit of Spin $\{-\frac{1}{2}\}$ **Is a Nucleus Orbit-Magnet** $\equiv \oplus$ Proton $\leftrightarrow$ $\ominus$ Electron, which **ORIGINATES The-Constant Resonance-frequency** f_R between them, becoming from the Eternal-changeable-motion of the Electron around the Nucleus and from the **Produced Variable – Magnetic - Orbital-Fields**. **Since the Total-Spin in Hydrogen** is measured **at the Nucleus Position** then, **Protons Absorb Energy from The-Electron-Spin** which is moving in its different directions, and **Store it as an Resonance-frequency** f_R , IN ORBIT-RIM $N - O$. This Orbit-Rim which is $[m_N, m_e, \text{Current-loop}]$, continually increases its Energy and so produces a Signal, f_R , in The Hydrogen-Atom i.e. **Gravity** g , and extending this to **Gravitational constant** G , acting On The **Varying-Velocity** $\dot{x}$ of the **Orbiting - Electron** Creates, **The Nutation of Electron**, which Work is Conserved as **The-Electron Magnetic Field** and **magnetic-moment**, $\vec{\mu}$, in a time T , and as an **Resonance - frequency** f_R . When velocity $\dot{x} = 0$ then Energy $E = U(x)$, i.e. The Signal is the Increasing Potential Energy in loop. **The** $[m_N, m_e, \text{Current-loop}]$ consists the **Energy - Bond** between **Atoms** and is the **Communication-tool**, *The Resonance Signal*, in all Universe. The Energy equation is $E_{\text{loop}} = E_{\text{dipole}} + \vec{\mu} \cdot [\nabla \times \vec{P}] \equiv E_{\text{dipole}} + \vec{B} \cdot [\nabla \times \vec{P}]$ (e) in which case **Of An – External Magnetic-Field**, P , the **Electron - Spin is swigging around the Magnetic-Vector** and this Motion, **The Nutation**, is transferred to the **Nucleus**. Above Property may be used in Cancer-Medicine.

The Produced-Work is The-Resonance-Frequency $f_N = \frac{sQ}{2\pi J_3 w} \equiv f_R = 2,8398447 \cdot 10^{10} \text{ s}^{-1}$.

IN MRI, this is the Transverse-Precession, where B-Vector creates an RF Signal from the Precessing Protons, and **Conserved Energy is the frequency** $f_N = f_R$.

Because of the Magnetic-field created On-Orbit and Applied at-Nucleus with the same Effect, then exists **LARMOR Equation** as, $w_0 = \gamma \cdot \beta_0 / 2\pi$, and for Hydrogen at 1,5 Tesla Magnet, $\gamma = 2,675 \cdot 10^8 / \text{sT}$, $\beta_0 = 1,5 \text{ T}$, then an-frequency $w = 63,864 \text{ MHz} = 63,864 \cdot 10^8 \text{ Hz}$, frequency $f_N = 2\pi \cdot w = 4,012575 \cdot 10^{10} \text{ s}^{-1}$.

Remark – 2 .

The Accumulation of Energy as $\dots(e)$ creates the **[The-Proton–Electron-Vector-Bracket]** which is the **BONDING - FREQUENCY**, $f_N = [\frac{sQ}{2\pi J_3 w}]$, and Happens in the **Maximum Potential cave** $E = -U(x)$, and which is needed for any **Two Atoms to Joint** and create **the molecules**. **Resonance Phenomena** in any Media (Mechanical, Electrical, Acoustic Magnetic) is that, for Response to be the maximum at a Specific-frequency f_R and **requires more Energy Input** including that of frequency. Nucleus with Spin $S \neq 0$ can absorb and emit Electromagnetic Radiation and undergo, **Resonance**, when placed in an Magnetic field. **This Uniform-Magnetic-field of Nucleus-Orbit**, $[p \leftrightarrow e]$, **already exists in Protons** which Eternally becomes from the Swinging of the Electron-Angular-velocity Cone, with **Spin-Vector** $\vec{S}$ in the axis of cone as **Angular-Momentum -Vector**, *the Polhode*, at a fixed Point of the **Central-Cone circle**. Because of Gravity, g , **SPIN** $\vec{\psi}$ is under **NUTATION** $\hat{\theta}$, and the **Response** is the **PRECESSION** $\hat{\phi}$, or it is $\rightarrow$ **THE ELECTRON-NUTATION** $\leftarrow$ due to **Gravity** is applied for a short time in the **Plane Perpendicular**, $\perp$, to the **variated Moment-Vector**, $|\vec{R}| \equiv |\vec{M}_T| = |\vec{M}_N| + |\vec{M}_O|$ and the Work produced is **Conserved** in $\rightarrow$ Nucleus-Orbit $[p \leftrightarrow e] \equiv$ the **[Energy-Box]**.

The Angular-velocity-cone, $\vec{w}$, is **Rolling with Spin-Vector** $\vec{B}$ in the central cone.

The Difference between the Potential-energy of the Orbit and that of the Electron-Nutation Precession with the lowest Potential energy, is the **Resonance –Frequency** $\equiv$ **The Energy**.

In figure 12, is shown the **Magnetic –Dipole-moment** of nucleus which is associated with the Orbital

Angular Momentum $|\vec{B}|$, *the Spin*, Resulting to the $|\vec{R}| \equiv |\vec{M}_T| = |\vec{M}_N| + |\vec{M}_O|$

When an External **Static-Magnetic-field** is Present then $\rightarrow$ **The Spectral-lines** $\leftarrow$

Split into Multiple-closely-Spaced-lines, because of the **Released-Energy** in the

Magnetic-Field, Due to the **Duality-Photon** as, $\vec{v} [\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}] \equiv \vec{v} \cdot [\vec{f}_n] + f_n$,

Above Zeeman-effect, *In Astrophysics*, is the trap of Magnetic field $\vec{B}_c \equiv [\frac{2\pi \cdot m_T}{qT}] \cdot f$ where frequencies are variated from Suns. *In Lasers*, is the cooled- velocity- trapping which is related to the Frequencies

In Electric-Dipole Spin, and it is the controlling of the Magnetic moment, $\vec{\mu} = \vec{B}$,

by flipping the Orientation of the Magnetic - Moment. [90].

As was calculated for the **Strength** of an **Magnetic-field** of 1 Tesla, the Static-Moment $= 1,174462 \cdot 10^{-4} = 11,74462 \cdot 10^{-5} \text{ eV}$. In the Absence of Electron, $|\vec{M}_T| \equiv |\vec{M}_N|$ The Spin exists as Nucleus-Magnetic-Field $\vec{B}_L$ only. The Kinetic Rotational-Energy in a monad, is the Scalar Quantity $L = E$, while the Vectors of, **Angular-Momentum** $\vec{B} \equiv \vec{S}$, and that of **Angular-Velocity** $\vec{w}$, and are related in monads as $\vec{B} \cdot \vec{w} = 2L = J \cdot w^2$

REMARK – 3 . In [69] 21 / 5 / 2017 was Proved and confirmed that ,

From Mechanics in case that , in an Axisymmetric Rotating Body , with constant Angular-Velocity ω , The moment of Inertia , $J_x = J_y$, is equal about the Two of the Three Principal axis , where Then exists

- 1.. **The Angular – velocity - Vector , $\vec{\omega}$, describes the Ellipsoid of Angular Velocity and its Nib describes a Cone of which Plane-Base is Fixed , and Simultaneously ,**
- 2.. **The Angular-Momentum , $\vec{B}$, 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 , $\vec{\omega}$, describes on the Tangential-Plane of the Angular-Momentum-Ellipsoid , The Herpolhode , while ,**
- 4.. **The Nib of Angular-Momentum-Vector , $\vec{B}$, describes on the Tangential-Plane , of the Angular-Velocity-Ellipsoid , The Polhode .**
- 5.. **The Fixed-Tangential-Planes on , $\vec{\omega}$, and , $\vec{B}$, Nib are alternately Perpendicular to , $\vec{B}$, and , $\vec{\omega}$, 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 , $\vec{B}$, and the Vector Angular – Velocity- Quantity is , $\vec{\omega}$, which Three monads are related as $\vec{B} \cdot \vec{\omega} = 2L = J \cdot \omega^2 = J \left[\frac{c}{r_m} \right]^2 = J \cdot [2\pi f]^2 = J \cdot [2\pi \frac{\sigma \Phi}{2\pi r}]^2 = J \cdot \left[\frac{\sigma \Phi}{r} \right]^2$ 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 , ω , 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 to 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 [64M].

The Energy E dissipated Per-cycle is equal to the Work $W_d \rightarrow E = h f = \frac{h(1+\sqrt{5})}{4\pi} \left| \frac{\sigma}{r} \right| = 8.k\zeta(\pi r^2) = h \frac{\sigma \Phi}{2\pi r}$ and Stored in monad , which is a Stationary Wave , in , n , loops as , $W_n = \left[\frac{4\pi r^2}{3} \right] \cdot f_n = \left[\frac{4\pi r^2}{3} \right] \cdot n f_1$.

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 of Energy** = 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 Vector-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 . **This is The Energy distance , The deep concept of Material-Geometry .** 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 that of motion of Particles . Since are also Quantized , Then , this Property is encountered in Stationary Waves where Energy , E , is Proportional to Angular – velocity -Vector $\vec{\omega}$. This Property of Particles where , Angular Momentum = The Spin , becomes from the Intrinsic , Inward , Cycloidal - Wave motion , which is their cause of their external motion as Outward-Propagating-Waves .[43]

The Material-Point was Proved to be a Mechanism of a Self-Sustaining-Oscillations of Electric and Magnetic Fields in the dimensions of their Space-Genesis , i.e. Energy $\equiv$ motion $\equiv$ Quaternion $\equiv$ Rotational + Translationl **Energy $\equiv$ Wave** , and is the Only way of Energy-transportation .

Sound waves in air are longitudinal waves of compression and rarefaction of the Medium Air-structure .

Transverse waves on the Surface of water consist of water moving Up and Down as the Wave spreads horizontally and radially onwards .

Transverse Elastic waves , sound , Propagate in a Solid following the Principal Stresses and Shears of Solid .

Electromagneti-Field between two Points 1 , 2 , is the Work $W = \int P.ds = Q \Rightarrow \frac{1}{1 \rightarrow 2}$ done per Unit-charge in

taking it from Point 1 to 2 . **EMF** = Electromotive-Force = **Power** = $\frac{\text{Energy}}{\text{Charge}} = \frac{V_e(q=i.t)}{i.t} = V I = V \cdot \left| \vec{Q} \Rightarrow \right| =$

Voltage x Current = $[\oplus \rightarrow AK_A \leftarrow \ominus] \times$ Ampere/Time .

Electromagneti-Waves oscillating in Spaces can sustain each other . The Waves which have wavelength $\lambda = v.T$ = $\frac{c}{f} = \frac{2.\pi}{k}$ with an frequency f and any Energy-Wave-Vector k , could be Refracted , Reflected and Polarized.

From relation $\pm$ Spin $\vec{B} = J \omega = \pi^2 . r^4 . f_n = \pi^2 . r^4 . \left[\frac{\sigma \Phi}{2\pi . r_n} \right] = \frac{\pi r^3 \Phi \sigma}{2}$ and wavelength $\lambda = c / f$, is seen that

Electromagnetic Waves carry Momentum = Spin = $\bar{B}$ Therefore Squeeze the **Radiation-Pressure** $\sigma = \frac{2\bar{B}}{\pi \Phi \cdot r^3}$.
From above implies that Radiation is of Wave nature .

In Maxwell's equations on an Propagating Electromagnetic-Wave , Electric-field Intension E , Magnetic-field Intension B , are Perpendicular each other and both to the Direction of Propagation , or of the Capacitor , C .
E-field $\perp$ Capacitor and , B-field is along the Perimeter of a circle $\rightleftharpoons$ to Capacitor where issues $B \perp E \perp C$.

The equations of EM-Wave $E_x = E_0 \cdot \sin[kz - \omega t]$, $B_x = B_0 \cdot \sin[kz - \omega t]$, where ω = The angular frequency
Wavelength $\lambda = c T = \frac{c}{f}$, The Wave-Vector $k = \frac{2\pi}{\lambda} = \frac{2\pi \cdot f}{c} = \frac{\omega}{c}$, and then $2\pi \cdot f = \frac{2\pi}{\lambda}$, Speed of Propagation $c = \frac{\omega}{k}$
i.e. **EM-Waves Propagate** with velocity $c = \frac{\omega}{k}$ **carrying Energy-Vector** $k = \frac{2\pi}{\lambda} = 2 \cdot E$ in Wavelength λ .

7-e.. The Focus and the Signals in Orbits :

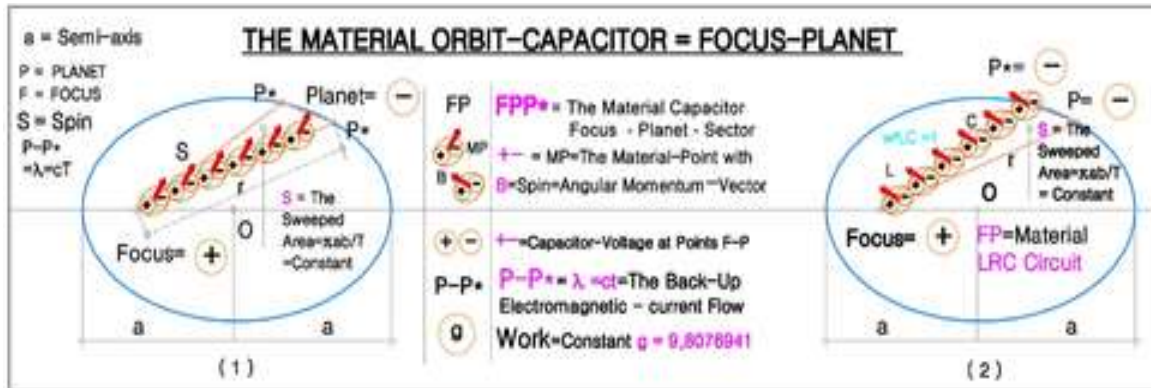


Figure -12- : The Material , **LRC Circuit** on **Orbit** , is on Focus-Planet-Sector $|F \leftrightarrow P|$:
In the Undamped **Planck's** - Conservative -System , the Total-Energy in **Hydrogen-cave** is , - 13,6 eV ,
corresponding to the Natural-frequency of the **Primary-Particle** with the less **Negative-Charge-frequency** ,
which is **The electron** and which mass m_e , and frequency f_e follow the minimum energy g . Electrons
equation of motion is $\ddot{x} + \omega^2 x = 0$ with solution $4\pi f_e^2 \cdot m_e = g$, where The Reaction to the Change
of motion , it is the **Electron mass** $m_e = \frac{g}{4\pi f_e^2}$, and the Primary equation of Electron is ,

$$\rightarrow \omega_e^2 \cdot m_e = \pi g = \text{constant} \leftarrow \dots (m)$$

Hydrogen-cave is a **Vacuum** in where exist also the **Lattice-Stationary-Spinning-Material-Point** , where
Energy in **Cave** , a , is from equation $E = \frac{k}{a} + \frac{L^2}{2ma^2}$, and Unit-Energy k becomes from equation $a^3 \cdot f_n^2 \cdot k = 1$
or as $\rightarrow k a = \frac{1}{a^2 f_n^2}$, and from velocity $c = \omega a = 2\pi f a$ is , $f_n^2 a^2 = \frac{c^2}{4\pi^2}$ then $k a = \frac{4\pi^2}{c^2}$ and ,

$$\text{The - Resonance - Energy} \rightarrow E = \frac{ka}{aa} + \frac{L^2}{2ma^2} = \frac{1}{a^3} \left[\frac{4\pi^2}{c^2} + \frac{S^2}{2m} \right] \dots (re)$$

A... The Gravity-System , It is Another Infinite $\pm$ Equilibrium-Rotating vectors $\bar{r}$, where
for Stability $\uparrow \bar{r} \downarrow \bar{r} = 0$, and which **Gravity-System** interacts with **Hydrogen-Cave-System** .
The condition for **Irrotational Energy** is $\rightarrow \nabla \times \bar{B} = \nabla \times \bar{S} = 0$, or $\nabla \times \bar{B} = \nabla \bar{r} + 2\pi m f \cdot \bar{a} = 0$,
and $\bar{r} = \pm 2\pi m f \cdot \bar{a}$. Vector $\bar{r}$, occupies Both directions for Rotational - equilibrium , i.e.

The vector $\bar{r} = \pm \bar{B} \equiv \bar{S}_n = 2\pi \cdot m \cdot f_n$, and $f_n = \frac{B}{2\pi m_e} = \frac{E}{h}$, which is the **Stationary-Filling-Ocean of the**
Spinning -Gravity Material Point , in the called Empty-Space , with frequency that of Material-Point ,
 $f_n = n \cdot f_1 = \frac{E}{h} = \frac{n \cdot v}{2\pi r} = \frac{n\sigma}{4\pi r} [1 + \sqrt{5}]$, and from $v = \omega r = 2\pi f r$ then , $f_n = v/2\pi r = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\sigma \cdot \Phi}{2\pi \cdot r_n}$, where
 $v = \sigma \cdot \Phi$, and Spin $S_n = \bar{B} = J \omega = \pi^2 \cdot r^4 \cdot f_n = e$, **An Spin-frequency-Orbit relation** .

B... The Hydrogen-Cave-System .

From the **Nucleus -Planet** velocity equations $K_E = \frac{mv^2}{2} = E - \left\{ \frac{k}{r} + \frac{L^2}{2mr^2} \right\} = 0$ and $4\pi f_e^2 \cdot m_e = g$, and
for Energy equation $E = \frac{\pi g}{r} + \frac{L^2}{2(g/4\pi f_e^2) r^2} = \frac{\pi}{g r^2} \cdot [g^2 r + 2 \cdot S^2 \cdot f^2] = 0$, then issues $[g^2 r + 2 \cdot S^2 \cdot f^2] = 0$, or

$$f^2 = \frac{r \cdot g^2}{2L^2} = \frac{r \cdot g^2}{2B^2 \omega^2} = \frac{r \cdot g^2}{2B^2 (2\pi f)^2} = \frac{r \cdot g^2}{8B^2 \pi^2 f^2} , \text{ since } 2L = B \omega , \text{ and then the}$$

Cave-Resonance-frequency of Nucleus-Planet is $\rightarrow f_c^4 = \frac{r_c \cdot g^2}{8\pi^2 S_c^2} \dots \dots \dots f(c)$, where

r_c = Nucleus -Planet-Segment , and S_c = the Spin of cave which consist the Cave-System ,

The Communication between the two Systems happens with their **Resonance-frequency** , and when

$$f_n^4 = \left| \frac{\sigma \cdot \Phi}{2\pi \cdot r_n} \right|^4 = \frac{r_c \cdot g^2}{8\pi^2 S_c^2} \text{ or as } \sigma^4 \cdot \Phi^4 \cdot [8\pi^2 \cdot S_c^2] = r_c \cdot g^2 \cdot [16 \cdot \pi^4 \cdot r_n^4] , \text{ and by Rearranging ,}$$

$$\sigma^4 \cdot \Phi^4 \cdot S_c^2 = r_c \cdot g^2 \cdot 2 \cdot \pi^2 \cdot r_n^4, \text{ or } \left| \frac{\sigma}{r_n} \right|^4 = \frac{2 \cdot \pi^2 \cdot r_c \cdot g^2}{\Phi^4 \cdot S_c^2} = \frac{2 \cdot \pi^2 \cdot g^2}{\Phi^4} \left[\frac{r_c}{B^2} \right] = \frac{16 \cdot \pi^4 \cdot f_n^4}{\Phi^4}, \text{ and the Resonance frequency } f_{\text{Resonance}}^6 = \frac{g^2}{8 \pi^2 r_c^2 B^2}, \text{ and } f_{\text{Res}}^3 = \frac{g}{2 \cdot \sqrt{2} \cdot \pi r |B|}, \text{ or } f_{\text{Resonance}}^2 = \frac{g}{\sqrt{2} \cdot \sigma \Phi |B|} \dots (f.r)$$

This **Frequency-Path-Way** through the line-Series of the infinite Spins $\bar{B}$, which Spins are Oriented and Reoriented Spins, from The **Two -Types of Material-Points**, shows the way that Planet P , and Nucleus N , are continually **communicating each other**. Fig-12-

The Kinetic-energy in Planck's System for any two masses m_1, m_2 is as,

$$\text{Total Kinetic Energy} \rightarrow E = \frac{1}{2} m_1 \cdot v_1^2 + \frac{1}{2} m_2 \cdot v_2^2, \text{ and because } v_1 = v_2 = v, \text{ then } E = \frac{v^2}{2} [m_1 + m_2], \text{ and since } m_1 = \frac{F}{g_1}, m_2 = \frac{F}{g_2}, \bar{v} = \bar{r}, \text{ and for Unit Work } E = 1, \text{ exists } E = \frac{v^2}{2} [m_1 + m_2] = \frac{r^2}{2} \left[\frac{F}{g_1} + \frac{F}{g_2} \right] = \frac{F \cdot r^2}{2} \left[\frac{1}{g_1} + \frac{1}{g_2} \right] = \frac{F \cdot r^2}{2} \left[\frac{g_1 + g_2}{g_1 g_2} \right] = \frac{F \cdot r^2}{2} \left[\frac{2 \cdot g}{g^2} \right] = \frac{F \cdot r^2}{g} = 1, \text{ i.e.}$$

Unit Work of force, F, between Two masses of constant Distance r_c , is Proportional to a Constant and Minimum Acceleration, g , the Layer, Stress $g \equiv 9, 8076925$, and is **inverse square to the distance as** $F = \frac{g}{r_c^2} \dots (r)$, i.e. $\rightarrow$ are **Newton's and Coulomb Laws** $\leftarrow$

Gravitational-Constant Force $\equiv G$, is Spread -over a **minimum - Surface, the Layer or Conductor or, a-Surface, or The-Permissible-Path**, in-where exists Reaction and which is called Impedance $\equiv$ mass. The Surface-force, g_G , is **becoming from the inner acceleration, f_n , of the Material-Points as Vector**, $\bar{r} = \pm \bar{B} \equiv \bar{S}_n$, is acting on Spins $\bar{B}$, and all the masses of the universe, or it is the Action of $G \rightarrow$ on $\bar{g} \rightarrow$ on $\bar{B} \equiv \bar{S} \rightarrow$ on g_G , through $f_{\text{Resonance}}$ since $f(c) \equiv f_{\text{Resonance}} = \sigma \Phi^3 = G$, and issues $\sigma = \frac{G}{\Phi^3} = \frac{G \cdot \sigma^3}{c^3}$, and $\sigma^2 G = c^3$, where σ , is the Stress σ_{Res} between all frequencies.

$$\text{The Resonance - Stress } \sigma = \sqrt[2]{\frac{c^3}{G}} = \frac{(2,9982 \cdot 10^8)^3}{(6,673692 \cdot 10^{-11})} = 6,3548867 \cdot 10^{17} \text{ Kg/m}^2$$

A clear Magnetic-Resonance-Imaging is Possible in [MRI] and to the other Media - MB under a Common Detector-Frequency. In the One degree of freedom Vibration of a mass, m , and Stiffness, k , in a distance, a , issues for, $w^2 = [k/m]$ the equation, $m \ddot{x} + w^2 x = 0$, with solution,

$$\text{The Period } T = 2\pi \sqrt{\frac{m}{k}}, \text{ or The Frequency } f_H = \frac{1}{2\pi} \sqrt{\frac{k}{m}}, \text{ and Energy} = h f_H \dots (1)$$

$$\text{From Orbit-equation } \bar{v} = \sqrt{\frac{2}{m} [E - \{ \frac{k}{r} + \frac{S^2}{2m r^2} \}]} \text{ and for } v = c \text{ then, } E = \frac{mc^2}{2} + \frac{k}{a} + \frac{L^2}{2ma^2} = hf_R$$

$$\text{Hydrogen Diameter } a_H = \sqrt[3]{\frac{1}{g f^2}} = \sqrt[3]{\frac{h^2}{g E^2}} = \sqrt[3]{\frac{[6,62606957 \cdot 10^{-34}]^2}{9,808 \cdot (13,6 \cdot 1,60218 \cdot 10^{-19})^3}} = 2,1127839 \cdot 10^{-11} \text{ m}$$

The constant Energy k , in Orbit is $\rightarrow k = \frac{L^2}{2ma}$ and depends on Total-mass-cave $m = M_T$.

For Total mass M_T , issues **The Parallel Connections-Resistors** inverse law, as in Electricity.

The Parallel LRC Circuit, with Impedance $\equiv$ Composite-Resistor of the R,L,C calculates the **Impedance**, of the Parallel RLC circuit and the **Current** drawn from the Supply. The Complex

- 1.. Impedance is $Z_T = \sqrt{R_T^2 + [L_T - C_T]^2}$, where $(w_0)^2 = LC$
- 2.. Total-Resistor $R_T = \left[\frac{1}{m_1} + \frac{1}{m_2} + \frac{1}{m_3} + \dots \frac{1}{m_n} \right]$, Total-Inductance $L_T = \{ q_1 + q_2 + \dots q_n + \dots \}$
- 3.. Total-Capacitance $C_T = \frac{1}{C_T} = \left[\frac{1}{n_1} + \frac{1}{n_2} + \dots \frac{1}{n_n} \right] \cdot w_0$, and Supply the Current $I_s = \frac{V_s}{Z_T}$. and
- 4.. $f_{\text{Reson}} = \sqrt[4]{\frac{1}{4\pi^2 m \cdot a^3}}$, with **Impedance $\equiv$ Resistor** and $w_0 = 1$ **System-Resistor unaffected**.

Remarks :

- 1.. From Light-velocity-equation $\bar{v} = \left[\frac{G \Phi}{A} \right] = \bar{c}$, Force $\bar{G}$ and velocity vector $\bar{c}$ are **Aligned**, therefore

The Duality-Photon $\{ \bar{c} \cdot \boxed{\bar{f}_n} + \bar{c} \cdot f_n \} \equiv$ Particle + Wave, follows the **Rectilinear- orbiting- motion**.

In Planck's length L_P , The light velocity vector $\bar{c} = \frac{G L_P}{r \cdot \Phi^2}$ by acting on cave, $r = L_P$, finds the Impedance $\equiv$ mass m_g , and becomes the Centrifugal-Force, F_g , of Cave which is Equal to Gravity **g while**, the Vector $\bar{v} = \bar{c}$ acting on a-cave, $r \neq L_P$, finds the-Impedance Z_c of Light - Velocity $\bar{c}$, and becomes the minimum-Energy-cave in L_P , which is $E = r Z_c \bar{c} = h$, which, r , cave is $r = \frac{h}{c Z_c} = 2,1127839 \cdot 10^{-11} \text{ m}$. From Kepler-second law of Areas, $g r^3 f_p^2 = 1$, frequency is

$f = 3,2839982 \cdot 10^{15} \text{ H}$ and Energy, $E = h f = 13, 6 \text{ eV}$, which is that of Hydrogen cave.

It was shown for the In-Planck's-length Gravity $\rightarrow \bar{g} = 4 \sqrt{3} \cdot \ln(3) \cdot \pi^2 L_P c^4 \leftarrow$ i.e.

It is the Centripetal-Force, $F_g = \bar{g}$, of The **Pointy-Spinning Material-Points** where

$$F_g = m_g \left[\frac{c^2}{r} \right] = J w^2 \cdot \frac{c^2}{r} \cdot g_Z = \left[\frac{\pi r^4}{2} \right] \cdot \left[\frac{c}{r} \right]^2 \cdot \left[\frac{c^2}{r} \right] \cdot \{ 2^3 \cdot \ln(3) \cdot \pi \sqrt{3} \} = 4 \sqrt{3} \ln(3) \cdot \pi^2 r c^4,$$

$$\bar{B} = S_{pg} = 4 \cdot \sqrt{3} \cdot 1,0986122886681 \cdot \pi^2 \cdot 1,616199 \cdot 10^{-35} \cdot [2,99819938]^4 = 9, 8076754 .$$

Moreover from relation $(4\pi a^3/3)^3 = 1,616229 \cdot 10^{-35}$, $a = 5,447 \cdot 10^{-11}$, or semi-major axis of Hydrogen cave is $a = 10^{-11}$ m, and $a = 2x = 2,1145016 \cdot 10^{-11}$ m. Placing in Hydrogen-Rim Period T , and Prior Semi-major axis a , then $\rightarrow k = \frac{T^2}{a^3} = \frac{[3,04513 \cdot 10^{-16}]^2}{[2,1145016 \cdot 10^{-11}]^3} = \frac{9,2728109 \cdot 10^{-32}}{9,4541768 \cdot 10^{-33}} = 9, 808238 \frac{s^2}{m^3} = \frac{N}{Kg}$, a Constant-Energy-Unit, which

agree with Gravity constant g , measured.

2.. From Electron-velocity-equation $\bar{v} = wr = 2\pi f r$ and from Kepler $4\pi^2 f^2 \cdot m_e \cdot k = \pi g$ then the

Electron's-velocity $v_e = r \cdot \sqrt{\frac{g}{m_e}}$, and so Electron follows, **Curvilinear motion** and that of Gravity.

From Force $G = \sigma A = [\frac{2\pi r f}{\Phi}] \cdot A = w r \cdot [\frac{A}{\Phi}] = \bar{v} [\frac{A}{\Phi}] \equiv \Phi^2 \cdot [\{\sigma \Phi\} \equiv 2\pi f_p r \equiv w r \equiv \bar{v} \equiv m g = \bar{c} = \frac{2 \cdot B}{\pi r^3}]$,

then is $\rightarrow$ The moving $\bar{c}$ in Storage $\frac{A}{\Phi}$, and all the other Types of motion.

3.. Since $G \equiv \sigma \cdot \Phi^3 \equiv \Phi^2 \cdot [\{\sigma \Phi\} \equiv 2\pi f_p r \equiv w r \equiv \bar{v} \equiv m a \equiv m g = \bar{c}]$ and Nutation-Frequency

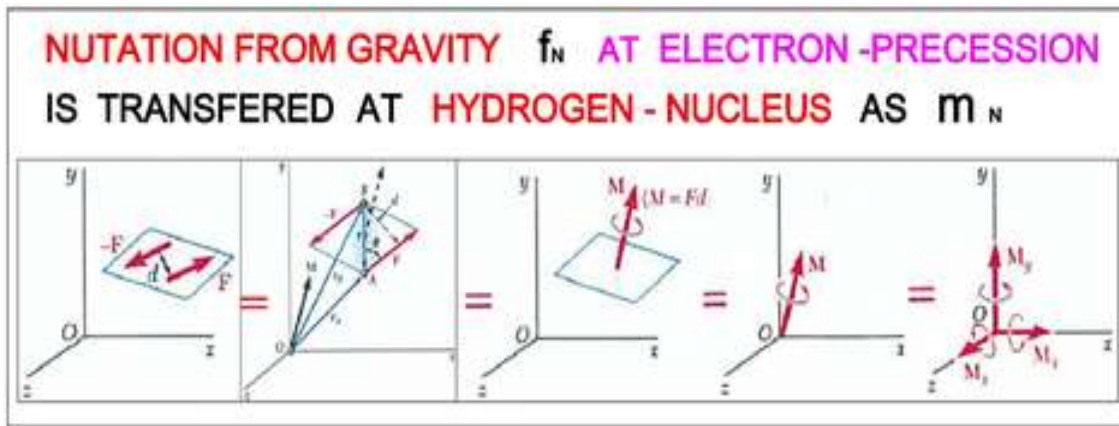
$$f_N = \frac{r_e \cdot Q_e}{2\pi \cdot J_3 w} = 2, 8398447 \cdot 10^{10} s^{-1}, \text{ then } f_N = \frac{r_e^2 \cdot \Phi \cdot Q_e}{2\pi \cdot J_3 G} \text{ is related to } G, \text{ related to } g.$$

It was Proved That $\rightarrow$

Anti-Quadrature $\equiv$ The Pushing of $\rightarrow$ { Each-Individual-Square $\equiv$ EM-Wave } $\leftarrow$ Into Its-Inscribed-Circle.

while **Quadrature $\equiv$ The Pushing of Inscribed-Circle Into $\rightarrow$ EM-Wave $\equiv$ Each-Individual-Square $\leftarrow$**

F.. : THE NEW ATOMS –STRUCTURE .



1f.. The Structure of Atoms in Planck-Cave $L_P \equiv e^{-i(\frac{5\pi}{2}) \cdot 10}$

Figure - 13 - : The Orbit-Electron-Spin is applied on the Nucleus-Proton-Spin :

DATA : Spin is a Free-Vector of Electron and can be applied at **Any-Point** with the same effect.

Couple $\equiv$ Moment $M = F \times d \rightarrow$ Vector, and may be resolved into **Component-vectors**

Electron-Nutation-Vector M_0 is the Resolved **Component-vector** $M_N + M_0$ at Nucleus.

Atom Structure is The Quantization - Process of frequency f_{ph} and Gravity g , in Energy Hydrogen Cave.

Atom Cave is a Potential of 13,60 eV becoming from the Energy-Cave and Kepler equation, $a^3 f^2 g = 1$,

or $a = \sqrt[3]{1/g f^2} = 2,1127839 \cdot 10^{-11}$ m, in the Planck cave $L_P \equiv e^{-i(\frac{5\pi}{2}) \cdot 10} \equiv \sqrt{3} \cdot \pi \cdot 1, 616199 \cdot 10^{-35}$ m.

The why such was Prior referred. Nucleus is held together by the Spin-Paring of the Spins in Nucleus.

1... The Light velocity vector $\bar{v} = \bar{c}$ is acting on cave, $r = L_P$, and finding Impedance the mass m_g ,

Becomes the Centrifugal-Force F_g of Cave and is Equal to Gravity g , while The **Light-velocity-vector**

$\bar{v} = \bar{c}$, acting on **an-cave**, $r \neq L_P$, finds The-Impedance Z_c of the Velocity $\bar{c}$, and Becomes the minimum

Energy cave in, L_P , and which is Equal to $E \equiv r Z_c \bar{c}$, where E = The Planck's-Total-Energy $E_p = h =$

$6,62606957 \cdot 10^{-34}$ J.s, r = The min-Energy cave of Hydrogen, Z_c = The Total Impedance in Universe $\equiv$

Space + Anti-Space from velocity motion $\bar{c}$ = The light-velocity in m/s. Equation becomes $r Z_c \bar{c} = E = h$

The **Three Elements** $\equiv$ Digits of Material-Geometry are, $\{\oplus, [\oplus \leftrightarrow \ominus], \ominus\} \equiv \{+, 0, -\}$ and as before for

$\log_x x$, and Base $x = 10$ then, $\log_{10} 10 = 10^{10}$ is the Growth, **Impedance is the Anti - Growth** or the

Anti - logarithms 10^{-10} of their **g-Position**, so Antilog $\frac{-g/10}{10} = 0, 10460975$

For the three dimensions Total-Impedance $Z_c = 0,10460975 \cdot (10^{-10})^3 = 1,046097 \cdot 10^{-31}$ and $r_H = \frac{h}{c \cdot Z_c} =$

$$= \frac{[6,62606957 \cdot 10^{-34}]}{2,99798 \cdot 10^8 \cdot 1,0460975 \cdot 10^{-31}} = 2, 1127839 \cdot 10^{-11} \text{ m, and is the Hydrogen cave i.e.}$$

The Quantization of Energy $\equiv$ Angular-Momentum $\equiv r m v$, which is Produced from the three Elements,

$\mathbf{r}$ = The Planet-Focus line-Segment ,
 $\mathbf{m}$ = The masses of Nucleus and Planet ,
 $\mathbf{v}$ = The velocity of the moving- mass

and follows Kepler-second-law , where for radius $\mathbf{r}$, sweeps out Equal-Areas in equal times And consequently **Energy-Quantization** becomes from equation $a^3 \cdot f_p^2 \cdot k = 1$ where $k = [\frac{4\pi^2}{GM}]$.The Unit-Work occurs in Hydrogen cave following Kepler-first law in Orbits , $4\pi^2 \cdot r^3 f_p^2 = k$, which $k =$ The **Quantized Work** $W = v^2 [\frac{h}{2\pi}]$ or Work = $k = 4\pi^2 \cdot r^3 f_p^2$ and being equal to the Unit-prior and so , $k = 4\pi^2 \cdot r^3 f_p^2 = \frac{1}{f^2 r^3}$ which results to the Resonance

frequency f_R as $f_R = \sqrt[4]{\frac{1}{4\pi^2 m r^3}}$ of cave $\mathbf{r}$, and from f_R the **Resonance Step-cave** $\rightarrow a = \sqrt[3]{\frac{1}{g f_R^2}}$ (1)

Atom-Cave is a , **Heap of Masses** M_T , *Protons Electrons and Neutrons* , and Charges Q_T , *Protons and Electrons* , follow the Lorentz force equation $\mathbf{F} = q \cdot [\mathbf{E} + \mathbf{v} \times \mathbf{B}]$ where $\mathbf{E} = 0$ and Force is $\bar{\mathbf{F}} = q \cdot \bar{\mathbf{v}} \times \bar{\mathbf{B}}$. The Created Magnetic-Field $\bar{\mathbf{B}}_F = |\frac{2\pi \cdot M_T}{Q_T}| f$, where in it the **Energy** $\equiv$

motion is **Quantized** , i.e. Magnetic-Field $\bar{\mathbf{B}}_F$ is the Store of Energy in motion , $\ddot{x} + \omega^2 x = 0$ Resonance Energy $\mathbf{E}_R$ becomes from **The Moving Electron in Orbit** of charge $\bar{q} \equiv \ominus$ with the **Orbit-Velocity Vector** $\bar{\mathbf{v}} = \sqrt{\frac{2}{m}} [E - \{\frac{k}{r} + \frac{L^2}{2m r^2}\}] = 0$, because charge $\bar{q}$ **Creates IN Orbit** , $\mathbf{r}$, the Varying Perpendicular Magnetic-Field $\bar{\mathbf{B}}$, which in time-turn **Creates** an Electric-field $\bar{\mathbf{E}} \perp \bar{\mathbf{B}}$ with resultant force $\mathbf{F}$ acting on Electron.

For velocity $\mathbf{c} = 0$, **then** in Orbit exists **Only-Potential-Energy** of Orbit , and $\mathbf{E} = \frac{k}{a} + \frac{L^2}{2m a^2}$, and using Kepler's law for equal-areas $k = \frac{L}{2m}$, and constant Planets relation $\frac{T^2}{a^3} = k = [\frac{4\pi^2}{G \cdot m}] = 2,97 \cdot 10^{-19} \text{ (s}^2/\text{m}^3)$ in Planck's length $a = \sqrt[3]{\frac{1}{k \cdot f^2}}$ then $k = 1/a^3 \cdot f^2$, and **Energy** $\mathbf{E} = \frac{1}{a^3 \cdot f^2} [\frac{1}{a}] + \frac{L^2}{2m a^2} = \frac{1}{a^4 \cdot f^2} + \frac{L^2}{2m a^2} = \frac{1}{a^2} [\frac{4\pi^2}{c^2} + \frac{L^2}{2m}]$, or $\mathbf{E} = \frac{1}{a^2} [\frac{4\pi^2}{c^2} + \frac{L^2}{2m}]$, $a^2 = [\frac{1}{E}] \cdot [\frac{4\pi^2}{c^2} + \frac{L^2}{2m}]$, and **Stored in the Magnetic field** i.e. Exists only

Potential-energy $\mathbf{L}$, and the **Orbit is that of Circle** .

2.. Electro-Mechanical Equation , $q \bar{\mathbf{B}}_L = 2\pi m f$, exploited in Hydrogen-Atom creates The **Uniform Magnetic-field** $\bar{\mathbf{B}}_L$ which IGNORES the velocities in cave , $\mathbf{a}$, and Capacitance in Energy-levels (1-2). The Heap of masses and Charges FOLLOWS Permutation - Rules as the Neutral-quantities and Newton Planetary-Laws as well as the Vibrating-equation , $m \ddot{x} + \omega^2 x = 0$, which gives the frequencies .

3.. Hydrogen - Cave is a **Uniform-Magnetic- field** , Because $\bar{\mathbf{B}}_L$, is **Independent** of the **Electron's -velocity** v_e and of the **Cave-radius** , $r \equiv a$, therefore electron is not accelerated in the Magnetic-Field , but its Strength is **Dependent on Quantum-frequency** , f , only .This demand formulates the Hydrogen-Energy-caves and the **Quantization** of Energy $\equiv$ motion , beginning from the Nucleus and extended to Orbits-Planets occupying ,

The Resonance-Energy $\mathbf{E}_R = \frac{1}{a^2} [\frac{4\pi^2}{c^2} + \frac{L^2}{2m}] = \frac{1}{a^2} [\frac{4\pi^2}{c^2} + \frac{S^2}{2m}]$ (2) which is a **Signal** .

2-f.. The Elements in the Atom cave $\rightarrow \{ \text{Masses} - \text{Charges} - \text{Caves} \}$

a-**Proton** $\oplus \rightarrow$ mass $m_p = 1,672 \cdot 10^{-27} \text{ Kg}$ $\rightarrow$ Charge $C_p = 1,602 \cdot 10^{-19} \text{ C}$ $\rightarrow d = 8,4 \cdot 10^{-16} \text{ m}$

b-**Electron** $\ominus \rightarrow$ mass $m_e = 9,11 \cdot 10^{-31} \text{ Kg}$ $\rightarrow$ Charge $C_e = 1,602 \cdot 10^{-19} \text{ C}$ $\rightarrow d = 5,0 \cdot 10^{-17} \text{ m}$

c-**Neutron** $[\oplus \leftrightarrow \ominus] \rightarrow$ mass $m_n = 1,672 \cdot 10^{-27} \text{ Kg}$ $\rightarrow$ Charge $C_n = 0,0 \text{ C}$ $\rightarrow d = 1,7 \cdot 10^{-15} \text{ m}$

d... **Newton's law** for masses is the Force $\rightarrow \mathbf{F}_N = \mathbf{G} \frac{m_1 \cdot m_2}{r^2}$, where $d = r$.

e... **Coulomb law** for Charges is the Force $\rightarrow \mathbf{F}_c = \mathbf{C} \frac{q_1 \cdot q_2}{r^2}$,

f- **Kepler laws** for Planets and **Constant-Areas** is , $4\pi^2 \cdot m \cdot f^2 \cdot a^3 = k$, $k \cdot f^2 \cdot a^3 = 1$

g- **Magnetic-fields laws** for Charges and Periods is , $T = \frac{2\pi \cdot m \cdot T}{q \cdot \bar{\mathbf{B}}_F}$, $\bar{\mathbf{B}}_F = \frac{2\pi \cdot m \cdot T}{q \cdot T} = \frac{|2\pi \cdot m \cdot T|}{Q_T} f$

h- The United Newton-Coulomb **Electro-Mechanical Equation** , $q \bar{\mathbf{B}}_L = 2\pi m f$, and the

Resonance frequency $f^4 = \frac{1}{4\pi^2 m a^3}$, or $f_R = \sqrt[4]{\frac{1}{4\pi^2 m a^3}}$ between Charges and masses .

The Total-energy for Unit-mass $E_T = K_E + P_E$, is from equation $\dot{x} \equiv \sqrt{\frac{2}{m}} [E - \{\frac{k}{a} + \frac{L^2}{2m a^2}\}] = c$ where for

$K_E = 0$, $c = 0$, $E = \frac{m \cdot c^2}{2} + \{\frac{k}{a} + \frac{L^2}{2m a^2}\}$, and Total- Energy becomes $E = \frac{k}{a} + \frac{L^2}{2m a^2}$ or , the Above

configuration of , masses m_L and Charges q_L in the Hydrogen cave , $\mathbf{a}$, **Forms** Harmonic Oscillator with a Natural Frequency f_R with the less Damping-factor (1/m).

The Quantum of a Magnetic-Field $\bar{\mathbf{B}}_L$ in a cave , $\mathbf{a}$, is the **Resonance - Magnetic Frequency** , f_R , **depended on the Stiffness** , the Damping $1/m$, **of the cave per unit Charge** q , as the **Electro-Mechanic-equation** $\rightarrow q \cdot \bar{\mathbf{B}}_L = [2\pi \cdot m_L] \cdot f_R \leftarrow$ where ,

- 1.... **Resistor R** , in **Electric Circuit** corresponds the analogous **Mass , m**, in **Mechanics** .
- 2.... **Inductor L** , in **Electric Circuit** corresponds the analogous **Energy , f** , in **Masses** .
- 3.... **Capacitor C** , in **Electric Circuit** corresponds the analogous **Magnetic , q** , in **Planes**.
- 4.... **Voltage V** , in **Electric Circuit** corresponds the analogous **Field-Strength. $\bar{B}_F$** , in **Fields**.
- 5... The Parallel RLC-Electric-Circuits Create a **Resonant Frequency** stored in Magnetic Field **$\bar{B}_F$** , while the Charged Electrons are stored as Energy in Static-Electric-Field .
Above configuration of , **RLC - Electric - Circuits** , forms the One –Mass-Harmonic-Oscillator in the Uniform-Magnetic-field **$\bar{B}_F$** and the same for the , **Masses , Charges , Caves** , as ,

1..... Case –A- → 1-Proton [$\oplus$] , 1-Electron [$\ominus$] , 1-Newtron [$\oplus \cup \ominus$] – [$\oplus \leftrightarrow \ominus$] :

The Nucleus Total-Harmonic mass $\equiv M_T$ is → $\frac{1}{M_T} = \frac{1}{m_p} + \frac{1}{m_n} + \frac{1}{m_e} = \frac{10^{27}}{1,672} + \frac{10^{27}}{1,672} + \frac{10^{31}}{9,11} = \frac{10^{31}}{8360} + \frac{10^{31}}{9,11} = \frac{10^{31}}{9,10084}$, and the **One-Total-mass-Oscillation** is, $\ddot{x} + \omega^2 x = 0$ with mass **m** = $M_T = 9,100084.10^{-31}$ Kg ..(1)

The System of Total- Harmonic-Charge $\equiv Q_T \equiv q_p + q_e = 2.1,6022.10^{-19} = 3,2044. 10^{-19}$ C

and the **Resonance-Charge-System** , $Q_T = 3,2044. 10^{-19}$ C(2) , with solution $f = \sqrt{\frac{k}{m}}$

The frequency of the Closed-Nucleus-Orbit-System becomes from Kepler second Planetary law equation , $4 \pi^2 m f_o^2 = k$, and constant law of Areas $l = k . f_o^2 . a^3$. Their common k ,

is Constant-Energy → $k = 4 \pi^2 m f_o^2 = \frac{1}{f_o^2 a^3}$ or , $f^4 = \frac{1}{4 \pi^2 m a^3}$ and , $f_R = \sqrt[4]{\frac{1}{4 \pi^2 m a^3}}$...(f)

With this way , **Impedance $\equiv$ Resistor** and $\omega_0 = 1$, the Resistor in the System is unaffected by the frequencies of Inductive and Capacitive Reactance and the Total-Resistance becomes as the above **m** = $M_T = 9, 100084.10^{-31}$ Kg . The Resonance-Cave-frequency is as (f) ,

$$f = \sqrt[4]{\frac{1}{4 \pi^2 m a_H^3}} = \sqrt[4]{\frac{1}{4 \pi^2 9,100084.10^{-31} (2,1145016.10^{-11})^3}} = \sqrt[4]{2,94439610^{60}} = 1,3099329.10^{15} \text{H}..(3)$$

Coulomb-law issues between Nucleus and orbit diameter **Charges** $d = 10^{-10}$ m , while

Newton's-law issues for all **masses** between Nucleus and Nucleus-Orbit $d = 10^{-14}$ m .

The System $M_T =$ masses , $Q_T =$ Charges creates a constant Magnetic-field $\bar{B}_F = \left| \frac{2 \pi M_T}{Q_T} \right| f$

The Magnetic-field-Strength $\bar{B}_F = \left| \frac{2 \pi M_T}{Q_T} \right| f = \frac{2 \pi 9,100084.10^{-31} [1,3099329.10^{15}]}{[3,2044.10^{-19}]}$ (Kg/Cs) = $2,3373706.10^4$ Tesla (4)

i.e. **$\bar{B}_F = 23,373706$ Kilo-Tesla**, → **the Strength of a Non - Magnetar Neutral star** , since 1Tesla = [N.s/C. m] = [N/Ampere . m] = [Kg /C.s] = 10^4 Gauss = 10^{-9} Mega-Tesla .

Resonance-Cave **a** = $\sqrt[3]{T^2/g} = \sqrt[3]{1/g f^2} = \sqrt[3]{1/g [1,3099329. 10^{15}]^2} = \sqrt[3]{7,78342. 10^{-33}} = 1,9817863.10^{-11}$

and the **Resonance - Energy** $E = \frac{1}{a^3} \left[\frac{4 \pi^2}{c^2} + \frac{L^2}{2m} \right]$, where

L = the Spin $S = 5,691952. 10^{-34}$ {Kg/m/s} , mass **$M_T = 9,100084.10^{-31}$ Kg** of System , **c** $\equiv 2,998.10^8$ m/s . and **E** = $[2,5461638.10^{21}] \times [4,392086.10^{-16} + 1,780111.10^{-37}] = 1,118297.10^6 \text{ J} + 4,5324541.10^{-16} \text{ J}$ (E)

i.e. **Energy in Electron-Orbit is $1,118297.10^7 \text{ J}$, or 11,2 Million Joules ,**

2..... Case –B- → 1-Proton [$\oplus$] , 1-Electron [$\ominus$] :

The Nucleus Total-Harmonic mass $\equiv M_T$ is → $\frac{1}{M_T} = \frac{1}{m_p} + \frac{1}{m_e} = \frac{10^{27}}{1,672} + \frac{10^{31}}{9,11} = \frac{16729,1.10^{27}}{15,23192} = \frac{10^{27}}{0,0009105} = \frac{10^{31}}{9,105}$ and $M_T = 9,105044.10^{-31}$ Kg(1)

The Nucleus-Orbit Total-Harmonic-Charge → $Q_T \equiv q_p + q_e = 2.1,6022.10^{-19} = 3,2044. 10^{-19}$ C and the **System-Resonance-Charge** $Q_T = 3,2044. 10^{-19}$ C(2)

The frequency $f = \sqrt[4]{\frac{1}{4 \pi^2 m a_H^3}} = \sqrt[4]{\frac{1}{4 \pi^2 9,105.10^{-31} (2,1145016.10^{-11})^3}} = \sqrt[4]{2,942807. 10^{64}} = 1,3097561.10^{16}$ H .

The Magnetic-field-Strength $\bar{B}_F = \left| \frac{2 \pi M_T}{Q_T} \right| f = \left| \frac{2 \pi m_T}{q_+} \right| f = \frac{2 \pi 9,105.10^{-31} [1,3097561.10^{16}]}{3,2044.10^{-19}}$ [Kg/C.s]

= $2,5424947.10^5$ Tesla $\equiv$ **0,25424947 Mega-Tesla** → **the Strength of a Neutron-star**

Energy in an Electron-cave where radius $r_e = 5,82.10^{-16}$ m , follows Energy-equation

$E = \frac{1}{a^3} \left[\frac{4 \pi^2}{c^2} + \frac{L^2}{2m} \right]$, where **L** = the Spin $S = 5,691952. 10^{-34}$ {Kg/m/s} , **c** $\equiv 2,998.10^8$ m/s .

mass **$M_T = 9,105044.10^{-31}$ Kg** of System , Energy is **E** = $[2,9522561.10^{30}] \times [4,392086.10^{-16} + 1,7791411.10^{-37}] = 1,2966562.10^{15} \text{ J} + 5,2524801.10^{-7} \text{ J}$ (E)

i.e. **Energy in Electron-Orbit is $1,29.10^{15} \text{ J}$, or 12,9 quadrillion Joules ,**

and equal about 60 Megatons of TNT .

When an **Electron** of mass $m_e = 7,2373149.10^{-32}$ kg is found in above Magnetic-field then

$$f = \sqrt[4]{\frac{1}{4\pi^2 m_e a_H^3}} = \sqrt[4]{\frac{1}{4\pi^2 7,237.10^{-32} (2,1145016.10^{-11})^3}} = \sqrt[4]{37,022376 \cdot 10^{60}} = \mathbf{2,4663545.10^{15}} \text{ H and Energy}$$

$$E = h f = 6.62607.10^{-34} \cdot 2,4663545.10^{15} = 1,6342237.10^{-18} \text{ J} / (1,6.10^{-19}) = \mathbf{10,201146} \text{ eV},$$

which is the **Energy in $n=1$ Energy-Level**, or

$$\text{From equation } m_e = \frac{g}{4\pi f^2 e}, f_e = E/h = [-13,6 \text{ eV/h}] \text{ then } f = \sqrt[4]{\frac{E^2}{4\pi^2 a_H^3 [g \cdot h^2]}} = \sqrt[4]{\frac{E^2}{\pi g h^2 a_H^3}}$$

3.... Case -C. $\rightarrow$ 1-Proton $[\oplus] \equiv$ An Ion-nucleus :

The Nucleus Total-Harmonic mass $\equiv M_T$ is $\rightarrow \frac{1}{M_T} = \frac{1}{m_p} = \frac{10^{27}}{1,672}$ and $M_T = 1,67.10^{-27} \text{ Kg}$, or

$$M_T = 1,67.10^{-27} \text{ Kg} / \mathbf{1,66053886.10^{-27} \text{ amu} = 1 \text{ amu}} \dots\dots\dots(1)$$

The Nucleus-Orbit Total-Harmonic-Charge $\rightarrow Q_T \equiv q_p = 1,6022.10^{-19} \dots\dots\dots(2)$

$$\text{The Resonance-Cave-frequency is } f = \sqrt[4]{\frac{1}{4\pi^2 m_e a_H^3}} = \sqrt[4]{\frac{1}{4\pi^2 1,672.10^{-27} 8.(2,1127839.10^{-11})^3}} =$$

$$\sqrt[4]{2,0051704.10^{60}} = 1,189975.10^{15} \text{ H} \dots(1). \text{ The System } M_T = \text{masses}, Q_T = \text{Charges}$$

creates a constant Magnetic-field $\bar{B}_F = \left| \frac{2\pi M_T}{Q_T} \right| f$, of **Strength** $\bar{B}_F = \left| \frac{2\pi M_T}{Q_T} \right| f$ as,

$$\bar{B}_F = \frac{2\pi 1,672.10^{-27} [6,32705.10^{14}]}{1,6022.10^{-19}} (\text{Kg/Cs}) = 4,1464883.10^7 \text{ Tesla} \dots(3) \text{ i.e.}$$

$\bar{B}_F = 4,1464883.10^7 \text{ Tesla} \rightarrow$ the Strength of a Non-magneton neutron-Star,

Energy in an Proton-cave and of radius $r_p = 8,42.10^{-16} \text{ m}$, follows Energy-equation

$$E = \frac{1}{a^3} \left[\frac{4\pi^2}{c^2} + \frac{L^2}{2m} \right], \text{ where } L = \text{the Spin } S = 5,691952.10^{-34} \{ \text{Kg/m/s} \}, c \equiv 2,998.10^8 \text{ m/s. The mass-System } M_T = 1,67.10^{-27} \text{ Kg, and the Energy is } E = [1,4105087.10^{30}] \times [4,392086.10^{-16} + 9,7000946.10^{-41}] = 6,1950755.10^{14} \text{ J} + 1,3682067.10^{-10} \text{ J, i.e. Two types of frequency.}$$

For the **Ion-Proton** $E = \frac{k}{a} + \frac{L^2}{2m a^2} = \left[\frac{L}{2m} \right] \frac{1}{a} + \frac{L^2}{2m a^2} = \frac{L}{2a.m} \left[1 + \frac{L}{a} \right]$ where a_p is Proton-cave, L is the Spin S , and m , is the mass of Nucleus, Placing above quantities then Energy becomes

$$E = \frac{5,691952.10^{-34}}{2,1,67.10^{-27} 8,4.10^{-16}} \left[1 + \frac{5,691952.10^{-34}}{8,4.10^{-16}} \right] = 2,028782.10^8 + 1,3747296.10^{-10} \text{ Joule.}$$

i.e. Energy of Charge-Proton is $0,203.10^9 \text{ J}$, or $0,203 \text{ Giga-Joules}$ and, it is equal about to the reduced Planck energy.

Remarks :

The Cave is composed of One mass in its Proton-cave with an **Magnetic-field** and of **Strength**

$$\bar{B}_F = 4,1464883.10^7 \text{ Tesla} = \mathbf{41,464883 \text{ Mega-Tesla}}, \text{ with a } \text{Frequency } f_R = 6,32705.10^{14} \text{ H.}$$

The fact that Atom's-nucleus occupies such Energy as that of Neutron stars, consists the Atom as the strongest massive element in nature. This quantity consists the minimum **Quantum of Energy** in this cave and can be said is the **Quantum of Magnetic-Energy** in Atom.

This case is very interesting because it is the Quanta of Electron in microcosm and macrocosm, i.e. the Spin of Electron is squeezing in the direction of the field-Space. **Since Energy exists on Magnetic-moment axis and Spin Precesses**, the highly magnetized vacuum must behave like a Prism that **Polarizes the light**, and this is happening because of the Two-Magnetic-fields in Atom. The Birefringence also split X-ray Photons into two.

The Physical interpretation is that, **The Quantum of a Magnetic-Field** $\bar{B}_L$ in an Hydrogen cave a , as the **Resonance-Magnetic-Frequency**, f_R , which is depended on the value of Angular-momentum, of the 1st **Quantum number**, which is the **Spin S**, of cave i.e.

1.. Charge $\bar{q} \rightarrow$ Is the **Quantum** of the Efficient-Energy.

2.. Photon $\rightarrow$ Is the **Quantum** of Electromagnetic Field $f_n = \left[\frac{n}{\pi^2 r^4} \right] \cdot \bar{B} \equiv \frac{(1+\sqrt{5}) \cdot \sigma}{4\pi r} = \frac{E}{h}$

where its Duality is as $\rightarrow \bar{v} \cdot \{ \bar{f}_n + f_n \} \equiv \left| \frac{v}{\pi^2 r^4 n} \right| \cdot \left| \bar{B}_n \right| + \left| \bar{c} \right| f_n$, *Stationary and Moving*,

3.. $\bar{q}_{\text{Photon}} \rightarrow \frac{G}{\sqrt{2} \cdot f} = \frac{G \cdot h}{\sqrt{2} \cdot E} = 3,13 \cdot 10^{-44} \text{ C}$, Is the **Quantum** of Material-points.

4.. $\bar{q}_{\text{Electron}} \rightarrow \frac{G}{c \sqrt{2}} = 1,58.10^{-19} \text{ C}$, Is the **Quantum** of the Plane-Magnetic-field.

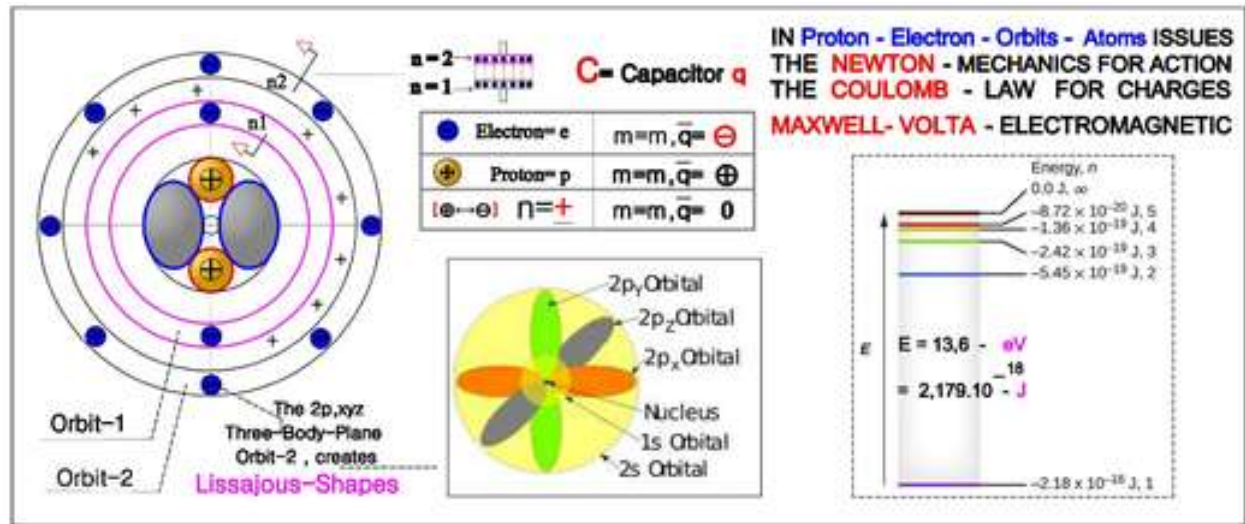


Figure-14- :The Analogous RLC-Electric-Circuit of Atom's Structure and Mechanics

4..... Case -D- → 2-Proton [⊕], 2-Electron [⊖], 2-Newtron [⊕⊖⊖⊖⊖] - [⊕ ↔ ⊖] :

The Nucleus Total-Harmonic mass $\equiv M_T$ is $\rightarrow \frac{1}{M_T} = \frac{2}{m_p} + \frac{2}{m_n} + \frac{2}{m_e} = \frac{2.10^{27}}{1,672} + \frac{2.10^{27}}{1,672} + \frac{2.10^{31}}{9,11} = \frac{10^{31}}{400,55} + \frac{10^{31}}{4,555}$
 $= \frac{405,105.10^{31}}{1824,5052} = \frac{10^{31}}{4,5037834}$, and $M_T = 4,5037834.10^{-31}$ Kg(1)

The Nucleus-Orbit Total-Harmonic-Charge $\rightarrow Q_T \equiv 2.q_p + 2.q_e = 2.1,6022.10^{-19} + 2.1,6022.10^{-19} = 6,4088.10^{-19}$ and **System-Resonance-Charge** $Q_T = 6,4088.10^{-19}$ (2)

The frequency of the Closed-Nucleus-Orbit-System becomes from the , Kepler second Planetary law equation , $4 \pi^2 m f_o^2 = k$, and constant law of areas $l = k . f_o^2 . a^3$. Their common , k , **constant energy**

is $\rightarrow k = 4 \pi^2 m f_o^2 = \frac{1}{f_o^2 . a^3}$ or , $f^4 = \frac{1}{4 \pi^2 m a^3}$ and frequency $f = \sqrt[4]{\frac{1}{4 \pi^2 m a^3}}$, becoming

$$f = \sqrt[4]{\frac{1}{4 \pi^2 m a_H^3}} = \sqrt[4]{\frac{1}{4 \pi^2 4,5037834.10^{-31} (2,1145016.10^{-11})^3}} = \sqrt[4]{5,949276.10^{60}} = 1,5617663.10^{15} \text{ H .}$$

The System $M_T = \text{masses}$, $Q_T = \text{Charges}$ creates a constant Magnetic-field $\bar{B}_F = \left| \frac{2 \pi M_T}{Q_T} \right| f$, where

$$\text{M-field } \bar{B}_F = \left| \frac{2 \pi M_T}{Q_T} \right| f = \frac{2 \pi 4,5037834.10^{-31} [1,561766.10^{15}]}{6,4088.10^{-19}} \text{ (Kg/Cs)} = 6,8959836.10^3 \text{ Tesla} \dots\dots(4)$$

$\bar{B}_F = 6,8959836.10^3 \text{ T} = 6,89598.10^3 \text{ Kilo-Tesla} \rightarrow \text{and is the Strength of a Non-Magnetar-Star}$
 1Tesla = [N.s / C .m] = [N / Ampere .m] = [Kg /C.s] = 10^4 Gauss = 10^{-6} Mega-Tesla.

Energy in cave $a = \sqrt[3]{T^2/g} = \sqrt[3]{1/g f^2} = \sqrt[3]{1/g [1,5617663.10^{15}]^2} = 6,5283506.10^{-9} \text{ m}$ which

follows the equation $E = \frac{1}{a^3} \left[\frac{4 \pi^2}{c^2} + \frac{L^2}{2m} \right]$, where L = the Spin $S = 5,691952 . 10^{-34} \text{ {Kg.m/s}}$, the mass $M_T = 4,5037834.10^{-31} \text{ Kg}$, of System , and light-velocity $c \equiv 2,998.10^8 \text{ m/s}$. Energy is $E = [2,3463513.10^{16}] \times [4,392086.10^{-16} + 3,5967888.10^{-37}] = 10,305376.10^0 \text{ J} + 8,43933.10^{-21} \text{ J} \dots(E)$
 i.e. Electron-Orbit-Energy is $10,30538 \text{ J} = 6,432096.10^{19} \text{ eV}$ become from the filled Helium-orbit.

5.... Case -E - → 20-Proton [⊕], 20-Electron [⊖], 20-Newtron [⊕⊖⊖⊖⊖] - [⊕ ↔ ⊖] :

The Nucleus Total-Harmonic mass $\equiv M_T$ is $\rightarrow \frac{1}{M_T} = \frac{20}{m_p} + \frac{20}{m_n} + \frac{20}{m_e} = \frac{20.10^{27}}{1,672} + \frac{20.10^{27}}{1,672} + \frac{20.10^{31}}{9,11} = \frac{10^{29}}{4,182} + \frac{10^{32}}{4,5553}$
 $= \frac{10^{32}}{4,5500438}$, and $M_T = 4,5500438.10^{-32} \text{ Kg}$ (1)

The Nucleus-Orbit Total-Harmonic-Charge $\rightarrow Q_T \equiv 20.q_p + 20.q_e + 20.q_n = 32,044.10^{-19} + 32,044.10^{-19} \text{ C}$
 and the **System-Resonance-Charge** $Q_T = 6,4044.10^{-18} \text{ C}$ (2)

The frequency of the Closed- Nucleus- Orbit- System becomes from Kepler second Planetary law equation , $4 \pi^2 m f_o^2 = k$, and the constant law of areas $l = k . f_o^2 . a^3$. Their common , k , is their constant energy as

$k = 4 \pi^2 m f_o^2 = \frac{1}{f_o^2 . a^3}$ or , $f^4 = \frac{1}{4 \pi^2 m a^3}$ and frequency $f = \sqrt[4]{\frac{1}{4 \pi^2 m a^3}}$ becomes the Resonance frequency

$$f = \sqrt[4]{\frac{1}{4 \pi^2 m a_H^3}} = \sqrt[4]{\frac{1}{4 \pi^2 4,5500438.10^{-32} (2,1127839.10^{-11})^3}} = \sqrt[4]{58,8879210^{60}} = 2,770171.10^{15} \text{ H} \dots\dots(3)$$

According to Planck equation , $E = h f = 6,62606957.10^{-34} . 2,770171.10^{15} = 1,8355345.10^{-20} \text{ Joules}$

The System $M_T = \text{masses}$, $Q_T = \text{Charges}$ creates a constant Magnetic-field $\bar{B}_F = \left| \frac{2 \pi M_T}{Q_T} \right| f$, where

$$\text{M-field } \bar{B}_F = \left| \frac{2\pi M_T}{Q_T} \right| f = \frac{2\pi \cdot 4,55 \cdot 10^{-32} [2,770171 \cdot 10^{15}]}{6,4044 \cdot 10^{-18}} \text{ (Kg/Cs)} = 1,2365715 \cdot 10^2 \text{ Tesla(4)}$$

$\bar{B}_F = 0,123657 \text{ Kilo-Tesla} \rightarrow \text{and it is the Strength of a Non-Magnetar-Star.}$

1Tesla = [N.s / C .m] = [N / Ampere .m] = [Kg /C.s] = 10^4 Gauss = 10^{-6} Mega-Tesla.

In cave $a = \sqrt[3]{T^2/g} = \sqrt[3]{1/g f^2} = \sqrt[3]{1/g [2,770171 \cdot 10^{15}]^2} = 2,3684748 \cdot 10^{-9} \text{ m}$, The Energy equation

$E = \frac{1}{a^3} \left[\frac{4\pi^2}{c^2} + \frac{L^2}{2m} \right]$, where L = the Spin $S = 5,691952 \cdot 10^{-34} \text{ {Kg/m/s}}$, and mass $M_T = 4,5500438 \cdot 10^{-32} \text{ Kg}$ of System, $c \equiv 2,998 \cdot 10^8 \text{ m/s}$. **Energy** $E = [1,7826351 \cdot 10^{17}] \times [4,392086 \cdot 10^{-16} + 3,5602202 \cdot 10^{-36}] \text{ J} = 7,8294866 \cdot 10^{11} \text{ J} + 6,3465734 \cdot 10^{-19} \text{ J} \dots\dots\dots(\text{E})$ i.e.

Energy in Electron-Orbit is 78,294866 J, Comparing to the Prior Helium is seen that Energy in Outer Orbits of **Calcium**, is less than Inner Helium. This is the why Bonds on Atoms with multiple number of electrons follow the Ionic Bonding.

6.... Case -D- $\rightarrow$ **-2- Proton** $[\oplus \leftrightarrow \oplus]$, **-2- Neutron** $[-[\oplus \leftrightarrow \ominus]] \equiv \{\text{The-Nucleus}\}$:

The Nucleus Total-Harmonic mass $\equiv M_T$ is $\rightarrow \frac{1}{M_T} = \frac{2}{m_p} + \frac{2}{m_n} = \frac{2 \cdot 10^{27}}{1,672} + \frac{2 \cdot 10^{27}}{1,672} = \frac{10^{28}}{4,18}$
and $M_T = 4,180 \cdot 10^{-28} \text{ Kg} \dots\dots\dots(1)$

The Nucleus-Orbit Total-Harmonic-Charge $\rightarrow Q_T \equiv 2 \cdot q_p + 2 \cdot q_e = 3,2044 \cdot 10^{-19} + 3,2044 \cdot 10^{-19} \text{ C}$
and the **System-Resonance-Charge** $Q_T = 6,4088 \cdot 10^{-19} \text{ C} \dots\dots\dots(2)$

The frequency of the Closed-Nucleus-Orbit-System becomes from Kepler second Planetary law equation, $4\pi^2 m f_o^2 = k$, and the constant law of Areas, $1 = k \cdot f_o^2 \cdot a^3$. Their common k, is Constant-Energy $\rightarrow$

$$k = 4\pi^2 m f_o^2 = \frac{1}{f_o^2 a^3} \text{ or } f_o^4 = \frac{1}{4\pi^2 m a^3} \text{ and Resonance frequency } f = \sqrt[4]{\frac{1}{4\pi^2 m a^3}} \dots\dots(f)$$

With this way, **The Impedance** $\equiv$ **Resistor** and $w_o = 1$, the Resistor in the System is unaffected by the frequencies of Inductive and Capacitive Reactance and the Total-Resistance becomes as the above mass $m = M_T = 4,180 \cdot 10^{-28} \text{ Kg}$. The Resonance-Cave-frequency is as (f),

$$f = \sqrt[4]{\frac{1}{4\pi^2 m a_H^3}} = \sqrt[4]{\frac{1}{4\pi^2 \cdot 4,180 \cdot 10^{-28} (2,1127839 \cdot 10^{-11})^3}} = \sqrt[4]{0,267927 \cdot 10^{60}} = 7,19456 \cdot 10^{14} \text{ H} \dots\dots(3)$$

According to Planck $E = h f = 6,62606957 \cdot 10^{-34} \cdot 7,19456 \cdot 10^{14} = 4,7678039 \cdot 10^{-19} \text{ Joules}$.

The System $M_T = \text{masses}$, $Q_T = \text{Charges}$ creates a constant Magnetic-field $\bar{B}_F = \left| \frac{2\pi M_T}{Q_T} \right| f$

$$\text{M-field } \bar{B}_F = \left| \frac{2\pi M_T}{Q_T} \right| f = \frac{2\pi \cdot 4,180 \cdot 10^{-28} [7,19456 \cdot 10^{14}]}{6,4088 \cdot 10^{-19}} \text{ (Kg/Cs)} = 2,9483812 \cdot 10^6 \text{ Tesla} \dots\dots(4)$$

$\bar{B}_F = 2,9483812 \text{ Mega-Tesla} \rightarrow \text{the Strength of a Non-Magnetar-Neutron-Star}$

1Tesla = [N.s / C .m] = [N / Ampere .m] = [Kg /C.s] = 10^4 Gauss = 10^{-6} Mega-Tesla.

In cave $a = \sqrt[3]{T^2/g} = \sqrt[3]{1/g f^2} = \sqrt[3]{1/g [7,19456 \cdot 10^{14}]^2} = 5,81840133 \cdot 10^{-10} \text{ m}$ Energy equation

$E = \frac{1}{a^3} \left[\frac{4\pi^2}{c^2} + \frac{L^2}{2m} \right]$ where L = the Spin $S = 5,691952 \cdot 10^{-34} \text{ {Kg/m/s}}$, and mass $M_T = 4,180 \cdot 10^{-28} \text{ Kg}$ of the System, $c \equiv 2,998 \cdot 10^8 \text{ m/s}$ in cave $a = 5,81840133 \cdot 10^{-10} \text{ m}$

$E = [2,9538785 \cdot 10^{18}] \times [4,392086 \cdot 10^{-16} + 3,8753966 \cdot 10^{-40}] = 1,2973688 \cdot 10^3 \text{ J} + 1,144745 \cdot 10^{-19} \text{ J} \dots(\text{E})$
i.e. Energy in **Nucleus-Cave** is equal to the, **Solar-Constant**, or to the

Total Radiation received from the Sun by an square meter per second.

n... Case -N- $\rightarrow$ **n-Proton** $[\oplus]$, **n-Electron** $[\ominus]$, **n-Neutron** $[\oplus \cup \cup \ominus] - [\oplus \leftrightarrow \ominus]$:

From a **Set of infinite rest, or, moving Units** choosing **Two of them**, is consisted, and is found, the Mendeleyev Periodic table in Planck's level 10^{-35} m (this Property issues in all Geometrical caves and in a cave of, 10^{-62} m , which is the Gravity level in which Gravity - Field exists), and all models of the atom also as follows,

a... In Set $\downarrow \equiv \{\text{Mould} \equiv \text{Space} \equiv \text{Cave}\} \rightarrow$ The minimum Number of Points in each Energy-Level is

1	for Material-Point,	$\rightarrow$	1	Point.	$\times 2 =$	2	Elements,
2	for Line-Vector,	$\rightarrow$	2	Points	$\times 2 =$	4	
3	for Plane	$\rightarrow$	3	Points	$\times 2 =$	6	
4	for Volume.	$\rightarrow$	4	Points	$\times 2 =$	8	
m	for, m, Spaces.	$\rightarrow$	m	Points	$\times 2 =$	2m	

b... Elements $\rightarrow$ The maximum number of **Elements** $\equiv$ **Digits** in Material - Point is, **2**,

[1 Positive $\oplus$ and 1 Negative $\ominus$] consisting the $\rightarrow$ Unit-M-P $\equiv \{[\oplus \leftrightarrow \ominus], \oplus, \ominus\}$

The possible Repetitive-Permutations for moulds and Elements are **Mould**^{Elements} = **m**², for every mould, so the **Available -Extrema-Positions for each mould** is **2m**² and for,

Point E-Elements, Material-Point, Permutations, m-Cave Shapes, are for,
Point $\rightarrow$ m=1 2 2 $\rightarrow$ 2 2 Sphere $\equiv$ S

Line-Vector $\rightarrow m=2 \quad 4 \quad 8 \rightarrow 2+8 \quad 10 \quad S+ \text{Lissajous-Figures}$
 Plane $\rightarrow m=3. \quad 6 \quad 18 \rightarrow 10+18. \quad 28 \quad \text{Two-Spheres}$
 Volume $\rightarrow m=4. \quad 8 \quad 32 \rightarrow 28+32. \quad 60 \quad \text{Three - Spheres}$
 m-Space $\rightarrow m=m \quad 2xm \quad 2xm^2 \rightarrow 2m^2+2(m-1)^2+2, \quad m\text{-Spaces-Volume}$
Photon $\rightarrow \bar{v} \cdot \{ \boxed{\bar{f}_n} + f_n \} \equiv | \frac{v}{\pi^2 \cdot r_n^4} | \cdot | \boxed{\bar{B}_n} | + | \bar{c} | f_n \leftarrow \text{was proved to be a Material-Point in cave , } r ,$

where its **Inner Storage** is *The Stationary-Standing-wave* $\{ \frac{v}{\pi^2 \cdot r_n^4} | \cdot | \boxed{\bar{B}_n} | \}$ as the Electromagnetic-Wave
 $[E^2+H^2] = 2(2r) \cdot c \cdot \sin 2\varphi$ with **n** Lobes representing the *Normal mode vibration* with the **n** ,frequencies
 $f_n = n \cdot f_1 = \frac{E}{h} = \frac{n \cdot v}{4r} = \frac{n\sigma}{8r} [1+\sqrt{5}]$, and **Outward the Storage** is the *Propagating Electromagnetic Wave* $| \bar{c} | f_n$ as $\rightarrow \{ [\epsilon E^2 + \mu B^2] = 2 \cdot \lambda \cdot c \cdot \sin 2\varphi \} \leftarrow$ where **Particle** $2r = n \lambda$, **Cave** **r** , is the *Electromagnetic Energy- Storage* , and Electromagnetic-Radiation , **E** , **B** , is the **Wave - Conveyer of Cave , r** , with frequency **f** = Energy **E** / Planck-constant **h** , or $f = E / h$. (Figure – 3 - 4) .

From relation Force $G = \sigma A = (2\pi f r) \frac{A}{\Phi} = w r = \bar{c} \cdot \frac{A}{\Phi}$, *The Action* of $G \rightarrow$ on $\bar{c}$ and following relation $\sigma \times \Phi^3 \equiv G$, and from Energy-force F_g in $r = L_p$ Planck's scale of mass $m_g = J \cdot w^2$, where angular-velocity $w = \frac{c}{r}$ and , the 3-Dimensional Space of the two $+$, $-$, are $[2^3 = (\oplus \leftrightarrow \ominus)^3]$ *then* , Impedance g_z , of Space $\ln(3)$ and Anti-Space , $\pi\sqrt{3}$, originates the Gravity as Centrifugal-Force $F_g = \bar{g} = m_g [\frac{c^2}{r}] = m_g [\frac{c^2}{r}] =$
 $J w^2 \cdot \frac{c^2}{r} \cdot g_z = [\frac{\pi r^4}{2}] \cdot [\frac{c}{r}]^2 \cdot [\frac{c^2}{r}] \cdot 2^3 \cdot \ln(3) \cdot \pi\sqrt{3} = 4 \sqrt{3} \cdot \ln 3 \cdot \pi^2 r c^4 = 9,8076754$, existing In-Out Atom .
 i.e. **Gravity** $\bar{g}$, is The effection of **G** force , on **c** light-velocity , in the 3-Dimensional Space and Anti-Space , 2^3 , In and Out the Planck- length $L_p = r$. Gravity existing in Hydrogen-Cave which is a *Uniform-Magnetic- field* , Because $\bar{B}_L$, is **Independent** of the **Electron-velocity** v_e and of the **Cave-radius** , **r** , therefore Electron is not accelerated in this Uniform-Magnetic-Field , but its Strength is **Dependent on frequency , f** , only .

The Process for , **n** , equal Opposite-Elements **for measuring Hydrogen-cave** :

The Nucleus Total-Harmonic mass $\equiv M_T \rightarrow \frac{1}{M_T} = \frac{n}{m_p} + \frac{n}{m_n} + \frac{n}{m_e} = \frac{2n}{m_p} + \frac{n}{m_e}$, because $m_n = m_p$

The Nucleus-Orbit Total-Charge $\equiv Q_T \rightarrow n \cdot q_p + n \cdot q_e$, where m_p = masses , q_T = charges

The Resonance-frequency of , Nucleus-Orbit-System is $f_H = \sqrt[4]{\frac{1}{4\pi^2 M_T \cdot (a_H)^3}}$, where a_H = Electron cave.

The constant Hydrogen-Uniform-Magnetic-field is $\bar{B}_{H-UMF} = | \frac{2\pi \cdot M_T}{Q_T} | \cdot f_H$ in Tesla ,

The Resonance - Cave , is $a_R = \sqrt[3]{T^2/g} = \sqrt[3]{\frac{1}{g} \cdot f_H^2}$ m , in Hydrogen-cave a_H in m ,

The Energy in Hydrogen-cave is $\rightarrow E = \frac{1}{a_R^2} [\frac{4\pi^2}{c^2} + \frac{S^2_T}{2m}] = \frac{1}{a_R^2} [\frac{4\pi^2}{c^2} + \frac{c \cdot a_H \cdot S_T}{2}]$ in Tesla ,

The Electric Force between u-Quarks and d-Quarks in Protons is $\rightarrow F_c = C \frac{q_1 \cdot q_2}{r^2}$ Newton .

Remarks on Cases A – B :

The Case –A-

It is composed of the three masses , m_p , m_n , m_e , which consist a Plane on which vibration of Charges Q_T is executed in Two Perpendicular directions , **x** , **y** , **The Phase-Plane** , which is the velocity-Vector Cartesian System , $x \perp \dot{x}$. The Total-Energy for Unit-mass is the $E_T = K_E + P_E = (\frac{1}{2}) \cdot \dot{x}^2 + U(x)$ = constant and by solving for $y = \dot{x}$ this Ordinate of the Phase - Plane is given by the Planar equation , $y = \dot{x} = \pm \sqrt{2[E - U(x)]}$, therefore Orbits can be , that of Circle and those of , ∞ , eight shapes in **x** , **y** Plane , following the linear-equation $\ddot{y} + w^2 y = 0$, of the two ordinates which form the **x** $\perp$ **y** Plane and which follow the *Lissajous Shapes* . This **x** $\perp$ **y** Plane is the reason for the **Two-loops** which are in case of **Cancer Cells** , the Double number of Chromosomes .

The Case –B-

It is composed of the two masses , m_p , m_e , which consist a Vector on which the Vibration of Charges Q_p is executed in the direction of Vector $\overrightarrow{PE}$. The **Resonance Frequency** $f = 1,3097561 \cdot 10^{16}$ H , and

The **Magnetic-field-Strength** $\bar{B}_F = 9,3530401.10^5$ Tesla , and are the **Quantum of Energy-Space** in the Hydrogen cave **a** . Since $G \equiv \sigma \cdot \Phi^3 \equiv \Phi^2 \cdot [\{\sigma \Phi\} \equiv [\frac{2B}{\pi r^3}] \equiv 2\pi f_p r \equiv w r \equiv \bar{v} \equiv m a \equiv m g = \bar{c} = \frac{2.B}{\pi r^3}]$ Therefore any effect of an changeable **g** , or any other effect becomes from Gravitational G directly .

The Case -C-

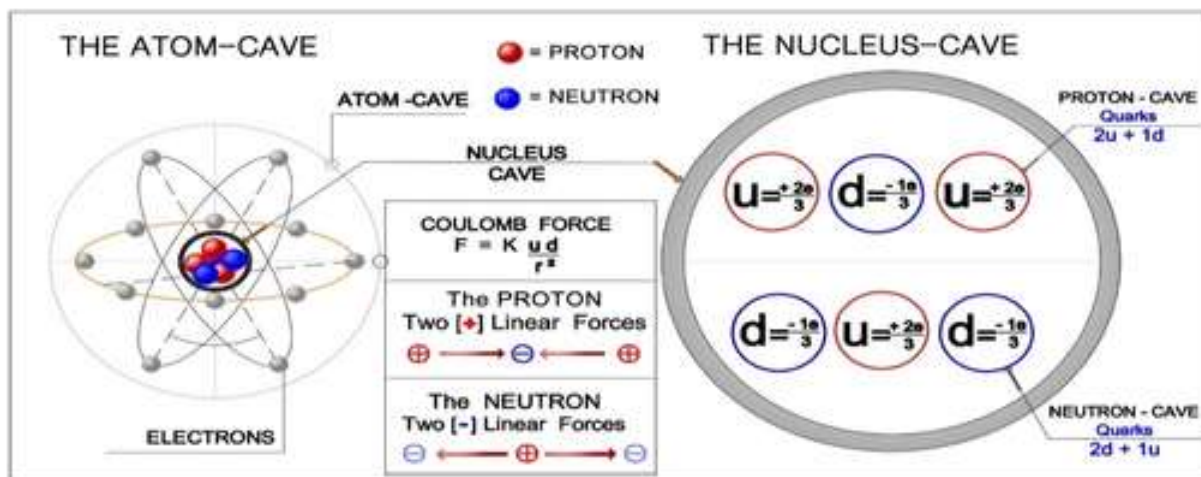
It is composed of One mass in its Proton-cave with an **Magnetic-field Strength** $\bar{B}_F = 4,1464883.10^7$ Tesla = **41,464883 Mega-Tesla** , with a **Frequency** $f_R = 6,32705.10^{14}$ H .

The fact that Atom`s-nucleus occupies such Energy as that of Neutron Stars , consists the Atom as the strongest massive element in nature . This quantity consists the minimum **Quantum of Energy** in this cave and can be said is the **Quantum of Magnetic-Energy** in Atom .

This case is very interesting because it is the Quanta of Electron in microcosm and macrocosm , i.e. the Spin of Electron is squeezing in the direction of the field - *Space* . **Since Energy is on the Magnetic moment axis and Spin Precesses** , then the highly magnetized Vacuum must behave like a Prism that **Polarizes the light** . This happens because of the Two-Magnetic-fields in Atom .

Birefringence also Split , X- ray Photons , into two or when the Opposite , to merge them together .

It was Proved that , **Anti-Quadrature** $\equiv$ **The Pushing of** $\rightarrow \{ \text{The-Energy-Square-Prism} , |Q_x| \cdot |Q_y| \cdot r \} \leftarrow$ **In Vectors-Square** $= [\overrightarrow{AK_A}] \times [\overrightarrow{A \uparrow K_A}] = [Q_x Q_y] = \mathbf{k}_x \mathbf{k}_y \equiv$ **The Energy-Square** $\equiv \text{CM} \times \text{CM} = \text{CMNH}$ **Into an Equivalent and Energy-Sphere-Cone**, while **Quadrature** $\equiv$ **The Pushing of the Inscribed To the** , **Energy-Square -Circle** , in **The Rotational To The Poles Squares** .



3-f... The Elements in the Proton-Neutral-caves $\rightarrow \{ \text{Masses-Charges-Forces} \}$

Figure – 15. The Structure within the Hydrogen-Nucleus of , $\oplus$ **Proton** , and $[\oplus \leftrightarrow \ominus]$ **Neutron**

The Proton is consisted of Three-Primary-Opposite-Spaces , $\oplus$, $\ominus$, $[\oplus \leftrightarrow \ominus]$, having masses m_p , Charges , $\bar{q}_p$, and caves $a_p = r$.

The elements in Proton are the Two u-Quarks and One d-Quark .

The total mass M_T in Proton follows , **The Parallel Connections Resistors** inverse law and for

The Proton Total-Harmonic mass $\equiv M_T$ is $\rightarrow \frac{1}{M_T} = \frac{1}{m_u} + \frac{1}{m_u} + \frac{1}{m_d}$,

The System with Total- Harmonic-Charge $\equiv Q_T \equiv 2.q_u + q_d = 2.(2/3).e - (1/3) e = + \frac{3}{3} e = + 1,6022.10^{-19} \text{ C}$, and the **System-Resonance-Charge** $Q_T = + 1, 6022.10^{-19} \text{ C}$ (2)

The Proton Total- Harmonic- Charge $\rightarrow Q_T \equiv 2.q_u + q_d$,and for the Resonance **Frequency** of the Unit-Cave is the Stationary-System becoming from Kepler second Planetary-law as equation , $4 \pi^2 m f_o^2 = k$, and constant law of Areas $l = k . f_o^2 . a^3$. Their common k , is the

Constant-Energy $\rightarrow k = 4 \pi^2 m f_p^2 = \frac{1}{f_p^2 a^3}$ or , $f_p^4 = \frac{1}{4 \pi^2 m a^3}$ and frequency $f_p = \sqrt[4]{\frac{1}{4 \pi^2 m a^3}}$

The measured magnitudes are as follows ,

a-Proton $\oplus \rightarrow$ mass $m_p = 1,672.10^{-27} \text{ Kg}$ $\rightarrow$ Charge $C_p = 1,602.10^{-19} \text{ C}$ $\rightarrow a = 8,4.10^{-16} \text{ m}$

b-Electron $\ominus \rightarrow$ mass $m_e = 9,11.10^{-31} \text{ Kg}$ $\rightarrow$ Charge $C_e = 1,602.10^{-19} \text{ C}$ $\rightarrow a = 5,0.10^{-17} \text{ m}$

c-**Neutron** $[\oplus \leftrightarrow \ominus] \rightarrow \text{mass } \mathbf{m_n} = 1,672.10^{-27} \text{ Kg} \rightarrow \text{Charge } \mathbf{C_n} = 0, 0 \quad C \rightarrow \mathbf{a} = 1,7.10^{-15} \text{ m}$
d-**u-Quark** $\rightarrow$ from equal masses $m_p = 2.m_u + m_d = 3.m_u = 1,672.10^{-27} \text{ Kg}$, and Quark masses
 $\mathbf{m_u} = \mathbf{m_d} = m_p / 3 = 5,573.10^{-28} \text{ Kg}$, and $\frac{1}{M_T} = \frac{1}{m_u} + \frac{1}{m_u} + \frac{1}{m_d} = \frac{3}{m_p} + \frac{2,3}{m_p} = \frac{9}{m_p}$ and the Proton
Resonance mass $M_T = \frac{m_p}{9} = 1,857777.10^{-28} \text{ Kg} \approx 16,7267 \text{ MeV}/c^2 \dots\dots(m)$

For Proton issues $q_p = 2.q_u + q_d = 2. \frac{2}{3} e - \frac{1}{3} e = e$, and the Stability of forces is axially .

Electron-Charge $\mathbf{C_e} = 1,602.10^{-19} \text{ C}$, while $\mathbf{C_{qu}} = \frac{2}{3} e = + \frac{2}{3} 1,602.10^{-19} \text{ C}$
 $\mathbf{C_{qd}} = - \frac{1}{3} e = - \frac{1}{3} 1,602.10^{-19} \text{ C}$, and from

$Q_T \equiv 2.q_u + q_d$, then Proton **Resonance charge** $Q_T = \frac{3.q_p}{3} = 1,602.10^{-19} \text{ C} \dots(c)$

Proton **Resonance-frequency** $f_p = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}} = \sqrt[4]{\frac{1}{4\pi^2 5,573.10^{-28} (8,4.10^{-16})^3}} = 5,26241.10^{17} \text{ H}$

Using the United Newton-Coulomb **Electro-Mechanical** Equation, $q\bar{B}_L = 2\pi.m f$, Proton **Magnetic-field**

$$\bar{B}_F = \frac{|2\pi.m_T|}{Q_T} f = \frac{2\pi.1,857777.10^{-28} 5,262409.10^{17}}{1,6022.10^{-19}} \text{ (Kg/Cs)} = 3,83389.10^9 \text{ Tesla}$$

which is the **Strength of a Magnetar**, i.e. A type of Neutron-Star having an extremely Powerful **Magnetic-field**, and **Electric-Forces** to be over **Ten –Thousands -Newton** .

The **Electric Force** between the **u-Quarks** and **d-Quarks** in Proton is from Coulomb law

$$\mathbf{F_{ud-p}} = C \frac{q_1.q_2}{r^2} = 8,9875.10^9 \text{ (Nm}^2/\text{c}^2) \cdot \frac{2}{9} [1,602.10^{-19} \text{ C}]^2 \frac{1}{(10^{-16})^2} = 1,997222.10^6 \text{ N} \dots\dots(F p)$$

and The **Electric Force** between the **u-Quarks** and **d-Quarks** in Neutron is found as ,

$$\mathbf{F_{ud-n}} = C \frac{q_1.q_2}{r^2} = 8,9875.10^9 \text{ (Nm}^2/\text{c}^2) \cdot \frac{2}{9} [1,602.10^{-19} \text{ C}]^2 \frac{1}{(10^{-16})^2} = - 1,997222.10^6 \text{ N} \dots(F n)$$

i.e. **Forces between the Opposites Equilibrium-Linearly** $\leftarrow [d-u-d] \rightarrow$ or $\rightarrow [u-d-u] \leftarrow$

For the **Neutral-cave** issues $q_n = 2.q_d + q_u = - 2. \frac{1}{3} e + \frac{2}{3} e = 0.e$, and the Stability of forces is axial as in Proton and this because the , Dynamical -Strip-Polygon , doesn't close .

Remarks :

1.. Gravitational force $G \equiv \sigma A \equiv [\frac{2\pi r f}{\Phi}] A \equiv \bar{v} [\frac{A}{\Phi}] \equiv \sigma . \Phi^3 \equiv \Phi^2 . [\{\sigma \Phi\}] \equiv$

$$G \equiv \Phi^2 . [\{\sigma \Phi\}] \equiv 2\pi f_p r \equiv w r \equiv \bar{v} \equiv m g = \bar{c} = \frac{2.B}{\pi r^3}] \rightarrow \text{i.e. } \mathbf{G}$$

is Related to $\rightarrow$ motion $\equiv$ work W , Spaces r , Anti-Spaces $1/r$, Stresses σ , Areas A , Caves a , ,

$\rightarrow$ Periods T , Frequencies f , Angular-waves w , Angular-Momentum B ,
 $\rightarrow$ Spin $B \equiv S$, velocities v , Light-velocity c , Impedances Z_n , Masses m ,
 $\rightarrow$ Gravity $\bar{g}$, Charges, $\bar{q}$, Electromagnetic - Fields, $\bar{E}$, $\bar{M}$, Hydrogen H ,
 $\rightarrow$ Atoms, Molecules, Golden-Ratio Φ , All-Universe . Markos 9/4/2020.

4-f.. The Energy in The Primary-Particles-caves :

The Total - Energy of an Elementary-Particle $\equiv$ Intrinsic Rotational + Kinetic Energy ,

From rotational Energy $B = r m v = S = \text{Spin}$ then , $m = \frac{B}{r.v} = \frac{B}{r.w r} = \frac{B}{r^2.w} = \frac{S}{r^2.w} \dots\dots(1)$

Centripetal-Energy $E_K = \frac{m}{r} v^2 = \frac{v^2}{r} [\frac{S}{r^2.w}] = \frac{w^2 r^2 S}{r.r^2.w} = \frac{w.S}{r} = \frac{2\pi f.S}{r} \equiv \frac{c.S}{r^2} \dots\dots(2)$

From Unit-Area-Energy $f^2.a^3 = \pi$, then $f = \sqrt[2]{\frac{\pi}{a^3}} \dots(3)$ and $E_K = \sqrt[2]{\frac{\pi}{a^3}} \cdot \frac{2\pi S}{r} \equiv \sqrt[2]{\frac{\pi^3}{a^3}} \cdot \frac{2S}{r} \dots(4)$

and or Energy from caves $\rightarrow E_K = \frac{k}{r} + \frac{L^2}{2m r^2} = \frac{k}{r} + \frac{L^2}{2(\frac{S}{r^2.w}) r^2} = \frac{\pi}{r} + \{\frac{S w}{2} = \frac{c S}{2r}\} = \frac{\pi}{r} + \frac{c S}{2r} \dots(5)$

1.. **Neutrinos** , v , $m = (3,11 .10^{-6}) \text{ MeV}/c^2 \times 1,8.10^{-28} = \mathbf{5,598 .10^{-34} \text{ Kg}}$

The Spin is , $S_v = 5,691952.10^{-34} \{ \text{Kg/m/s} \}$, $a_v = 7,0.10^{-21} \text{ m}$, $f_v = [E_{vK} = mc^2] / h = \mathbf{5,6.10^{-34} [10^{17}].1,6022.10^{-19} = 8,96912.10^{-36} \text{ J} / [6,626.10^{-34} \text{ Js} = \mathbf{13,536244. 10^{17} / s}}$

From cave $r = 7.10^{-21} \text{ m}$, and frequency $f = \sqrt[2]{\frac{1}{g.a^3}} = \sqrt[2]{\frac{9,8078}{(7.10^{-21})^3}} = 5,347345.10^{30} \text{ H}$ then ,

$$\mathbf{E_{vK}} = h . f_v = 6,62607.10^{-34} \text{ J s.} [5,347.10^{30}] / (1,6022.10^{-19} \text{ eV}) = \mathbf{2, 2114518.10^{14} \text{ eV}}$$

Using $\mathbf{E_{vK}} = \frac{k}{r} + \frac{c S^2}{2m r^2} = \frac{36.10^{-20}}{7.10^{-21}} + \frac{3.10^8 (5,691952.10^{-34})^2}{2.3,922.10^{-36} [7,0.10^{-21}]^2} = 51,428 \text{ eV} + 2,528774.10^{17} \text{ eV}$

$= 252,8774, [10^{15}] \text{ TeV} \rightarrow$ Is The Total Energy of the Sun when is striking Earth-face per-second .

The Energy Unit-Charge $\rightarrow E_{vB} = 51,428 \text{ eV}$ in Neutrino , and is that Energy needed for the merging with other Particles .

$a_e = 5,0.10^{-18}$ m , Charge $C_e = 1,602.10^{-19}$ C , Spin $S_e = \frac{S}{2} = 2,845976.10^{-34}$ {Kg/m/s},

From cave $r = 5.10^{-18}$ m and frequency $f = \sqrt{\frac{g}{a^3}} = \sqrt{\frac{9,8078}{(5.10^{-18})^3}} = 2,801114.10^{26}$ H then ,

Using $E_{ek} = \frac{k}{r} + \frac{cs^2}{2mr^2} = \frac{36.10^{-20}}{7.10^{-18}} + \frac{3.10^8(5,691952.10^{-34})^2}{2.9,198.10^{-34}[5.10^{-18}]^2} = 51,428$ eV + $2,111843.10^{10}$ J
 $= 51,43$ eV + $1,32.10^{29}$ eV $\rightarrow$ The Energy of 133 gr to fall 1 meter against gravity.

3.. **Gamma-ray** , γ , is the **Photon-Energy** $E = \bar{c} [\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}] \equiv \bar{v} \cdot [\bar{f}_n] + f_n$, with Spin =1 and
 it is an **Energy-Storage** $S \equiv [\oplus \leftarrow r \rightarrow \ominus] \equiv \text{Particle } [\bar{v} \cdot \bar{f}_n] \rightarrow [\bar{v} = \bar{c} = \lambda \frac{f}{\Phi}] \rightarrow$ and is
 an **Stationary-Standing-Wave** $\rightarrow [S \equiv [EM-R \equiv f_{1=N}, f_2, f_D, f_n = w^2] = 2.(2r).c.\sin 2[\varphi \equiv \frac{\bar{B}}{\Phi}]$

2.. **Energy-Motion** $M \equiv [\bar{v} - \text{Vector}] \equiv \text{Wave } [\bar{v} \cdot f_n] \equiv [f_1 = (E^2 + H^2) = n \frac{\Phi \cdot \sigma}{2\pi r} = \frac{n \bar{B}}{\pi^2 r^4}]$
 i.e. is an **Propagating Wave** $\{ W \equiv EM-R \equiv [\epsilon E^2 + \mu B^2] = 2.\lambda c. \sin 2[\varphi \equiv \frac{\bar{B}}{\Phi}] \}$

Energy under Planck-scale $E = [\Phi \frac{\sigma}{4\pi r}] \cdot \bar{B} \equiv \frac{|\bar{B}|^2}{2 \pi^2 r^4}$ where $B_p = 5,691952.10^{-34}$ {Kg/m/s},

$$\bar{q}_{\text{Photon}} = \frac{G}{\sqrt{2}f} = \frac{G.h}{\sqrt{2}E} = \frac{[6,6736923.10^{-11}].[6,62606957.10^{-34}]}{\sqrt{2}.E=1} = 3,127 \cdot 10^{-44} \text{ C} . \quad \text{i.e.}$$

The Energy in Photon is **Dependent** on the Gravitational **G** and frequency **f_p** of **Storages** .

Issues $\rightarrow 1\text{eV} = 1,6022.10^{-19}$ J $\leftarrow 10^3\text{eV} = 1,6022.10^{-16}$ J, $10^6\text{eV} = 1,6022.10^{-13}$ J , $10^7\text{eV} = 1,6022.10^{-12}$ J , $10^9\text{eV} = 1,6022.10^{-10}$ J , $10^{12}\text{eV} = 1,6022.10^{-7}$ J and from $f = E / h$ then ,
 $f_{1\text{eV}} = 1,6022.10^{-19}$ J / $[6,62606957.10^{-34}] = 2,418024.10^{14}$ H
 $f_3 = 2,418024.10^{17}$ H , $f_6 = 2,418024.10^{20}$ H , $f_7 = 2,418024.10^{21}$ H , $f_9 = 2,418024.10^{23}$ H ,

The Total-Energy of an Electron-Charge ,q , in a Voltage V is $E = h f = q V$, where $f_e = \sqrt{\frac{1}{a^3}}$

Voltage V $= \frac{hf}{q} = \frac{hc}{q\lambda} = \frac{6,62606957.10^{-34}.2,9979.10^8}{1,602.10^{-19}.\lambda} = 12,3983.10^{-7} [\frac{1}{\lambda}] \text{ eV} = 12,398$ eV for $\lambda = 10^{-7}$ m

or **V** $= \frac{hf}{q} = \frac{6,62606957.10^{-34}}{1,602.10^{-19}c} \sqrt{\frac{1}{a^3}} = 4,1361232.10^{-15} \cdot \sqrt{\frac{1}{a^3}} \text{ eV} = 4,1361232.10^{-15} \sqrt{\frac{1}{10^{-21}}} = 12,398$ eV

i.e. The Voltage $V = \frac{E}{q} = \frac{q}{C} = L \frac{di}{dt} = R i$, $i = \frac{di}{dt}$, of a cave , **a** , is dependent on inverse **a** , since $\lambda = 2a$.

In cave 10^{-13} m exists min-energy ,and from $g = f_n^2 a^3$, or $f_y = \sqrt{\frac{g}{a^3}} = \sqrt{\frac{9,807}{10^{-39}}} = 9,903.10^{19}$ H

Max-Energy is $E = h f_y = 6,62606957.10^{-34} \cdot 9,903.10^{19} / 1,6.10^{-19} = 4,095543.10^5$ eV

Since **G** Effects on $\bar{c}$ velocity through eq. $\rightarrow E = h f_y = \bar{c} \cdot [\bar{f}_n] + f_n$ then $[\bar{f}_n] + f_n = \frac{E}{\bar{c}} = f_y$

or Energy $\bar{E}_{\text{Photon}} = 1,6\text{eV} = 12,4 \text{ eV} + 1,6.10^{-16} \text{ eV}$ and for $E = 10^n \text{ eV}$, then Photon-Energy is
 $\bar{E}_{\text{Photon}} = n,6\text{eV} = 12,4 \text{ eV} + 1,6.10^{[n-16]} \text{ eV} \dots\dots\dots(n \text{ eV})$

Gamma-ray , γ , is the minimum Energy = $2,77344.10^{-14}$ eV and in the Smallest acceleration Space , or in cave $a_y = 1.10^{-13}$ m where issues $f_y = 5,6.10^{19}$ H.

X-ray , X , is of $\bar{E}_{\text{Photon}} = 2,6\text{eV} = 5,203.10^{[-14]} \text{ eV}$, $f_x = 5,605.10^{19}$ H and $a_x = 1.10^{-14}$ m

From above is seen the How **Duality-Photon-Energy** is working , $E = \bar{c} \cdot [\bar{f}_n] + f_n$] and from

Stress $\rightarrow \sigma = [\frac{2\pi r}{\Phi^2}] \cdot f_n = [\frac{2\pi r}{\Phi^2}] \cdot [\bar{f}_n] + f_n \equiv [\frac{2\pi r}{\Phi^2}] \cdot \bar{f}_n + [\frac{2\pi r}{\Phi^2}] \cdot f_n \equiv \text{Storage} + \text{Information}$

and it is **The Way of Energy-Storage and Stress-Information** in Nature . In **Quaternion** with Real and Imaginary Part , **Energy Acts only** on the **Resultant-Direction End-Points** Carrying Energy from One-Edge to another Edge, and shows Cosmic-Particles-Origin.

THE PHOTON'S ELECTROMAGNETIC - SPECTRUM:

Photon-ray , $f_{ph} \rightarrow [> a_{ph} = 1.10^{-13} \text{ m} > 1.10^{-[14+n]} \text{ m} , f_{ph} = [\bar{f}_n] + f_n] = \frac{E}{\bar{c}} = f_y$

$\bar{E}_{Ph=n,eV} = 12,4 \text{ eV} + 1,17444.10^{[-n-16]} \text{ eV}$, where $n = 1, 2, 3, \dots n$

Gamma-ray , $\gamma \rightarrow [1.10^{-10} \text{ m} > a_y = 1.10^{-12} \text{ m} > 1.10^{-[14+n]} \text{ m} , f_y = 1,774.10^{19} \text{ H} > 10^{19+n\infty}$

$\bar{E}_{\gamma,eV} = 1,17444.10^{[-14-16]} \text{ eV}$, in $2r = 10^{-12} \text{ m}$, $f_{yR} \rightarrow 10^{20} \text{ H}$

X-ray , X , $\rightarrow [1.10^{-8} \text{ m} > a_x = 1.10^{-9} \text{ m} > 1.10^{-10} \text{ m} , f_x = 1,774.10^{18} \text{ H} \cong 10^{18} \text{ H}$

$\bar{E}_{X,eV} = 1,17444.10^{[-12-14]} \text{ eV}$, in $2r = 10^{-10} \text{ m}$, $f_{xR} \rightarrow 10^{18} \text{ H}$

Ultraviolet , $\rightarrow [1.10^{-6} \text{ m} > a_x = 1.10^{-8} \text{ m} > 1.10^{-10} \text{ m}, f_x = 1,774.10^{17} \text{ H.} \cong 10^{17} \text{ H}$
 $\bar{E}_{x,eV} = 1,17444.10^{[-10-12]} \text{ eV}$, in $2r=10^{-8} \text{ m}$, $f_{yR} \rightarrow 10^{16} \text{ H}$

i.e. Electromagnetic-Spectrum $\equiv$ Photon in all its frequencies.

Remark :

For **Neutral-caves** issues $q_n = 0.e$, and the Stability of Forces is **Axial** as in Proton and this because the **Forces – Dynamical – Strip – Polygon** closes **Linearly** . This Property issues on , Markos [STPL] **Six-Triple-Points-Line** , where **Spaces and Anti-Spaces Equilibrium** [91] . In , [H - The Elementary Particles] , is Geometrically Proved above equilibrium by Using the Ptolemy's Theorem 1 ,2 , and the CEBA Theorem **In Space** , **Anti-Space** , **Sub-Space Triangles** .

SUMMARY :

- 1... **Force $\underline{G}$, The Gravitational-Constant-Force $\underline{G}$, becomes as Stress $\equiv$ Force/Area $\equiv \underline{g}$, as equation**
 $G = g k_E = g \cdot [g_E k_E] = [\frac{T^2_P}{a^3}] \cdot [g_L k_L] = [\frac{c \cdot r^3}{a^3}] \cdot [g_L k_L] = 9,8076925 * 6,8116.10^{-12} \equiv 6,68056.10^{-11} \frac{m^3}{Ns^2}$
and Effects on Gravity - Stress $\rightarrow g \equiv 9,8076925 \frac{Kg}{cm^2}$ [73] . From the Beyond-Planck-length force
 $\underline{F} = \underline{\sigma} \cdot \underline{A}$ = The Glue-Bond $\equiv$ Stress x Area $\equiv [\frac{2\pi f \cdot r}{\Phi}] \cdot A = w \cdot r \cdot [\frac{A}{\Phi}] = \bar{v} [\frac{A}{\Phi}]$, then The-Gravitational force
Is expressed as $\rightarrow F = G = \underline{\sigma} A = [\frac{2\pi r f}{\Phi}] \cdot A = \bar{v} [\frac{A}{\Phi}] \equiv \sigma \cdot \Phi^3 \equiv \Phi^2 \cdot [\{\sigma \Phi\} \equiv 2\pi f_P r \equiv \frac{2B}{\pi r^3} \equiv w \cdot r \equiv \bar{v} \equiv m \cdot g = \bar{c}] \leftarrow$ i.e.
Force $\underline{G}$ is converted from an axial force $\bar{F} \equiv$ motion , on a Surface $A \equiv$ Space , to Stress $\underline{\sigma}$, in any cave
 $\underline{r}$, as frequency f_P , and as Angular-velocity $\bar{w}$, and Angular-momentum $\bar{B}$, everywhere as velocity $\bar{v}$,
And in Planck-scale-Length P_L , as light-velocity $\bar{c}$ and Gravity $\underline{g}$. Because velocity $\bar{c}$, carries
the motion in Photon-Boxes and every where ,and Photons are related to $\underline{G}$, through stresses $\underline{\sigma}$,and
 $G = \sigma \cdot \Phi^3 = [\sigma \cdot \Phi] \cdot \Phi^2 = [2\pi \cdot f] \cdot \Phi^2 = [2\pi \cdot \Phi^2] r f$, which also carries the **Golden-ratio-Pattern in all**
microcosm from its Genesis and especially in macrocosm as Stress $\rightarrow \underline{\sigma} = [\frac{2\pi r}{\Phi^2}] \cdot f_n$ frequency .
- 2... **Dual-Photon $\bar{v} = \bar{c} \cdot [\bar{f}_n] + f_n$, is Particle + Wave $\equiv$ Energy moving with light-velocity and its**
Duality exists in frequency . The Material-Points travel with velocities $\underline{n} \cdot \bar{c}$, and are
as $\bar{v}_m = n \cdot \bar{c} \cdot \{[\bar{f}_n] + f_n\} \equiv [\frac{G}{\Phi^3 L_P}] \cdot \{[\bar{f}_n] + f_n\}$, where $[\bar{f}_n]$ is the Stationary Storage
and $[f_n]$ Travels as an Propagating Electromagnetic-Radiation where motion $\equiv$ Energy $\equiv$
Wave as Electric-Force and is altered to the , Space $\equiv$ Magnetic force as $\bar{E} = \bar{B} \cdot \bar{c}$.
Since $G \equiv \sigma \cdot \Phi^3 \equiv \Phi^2 [\bar{c}]$ then $\rightarrow$ The only Force creating velocities is Force - $\underline{G}$.
- 3... **Light Velocity $\bar{v} = \bar{c} = \frac{F \cdot \Phi}{A} = [\frac{G \cdot \Phi}{A \cdot b}] = [\frac{6,673692 \cdot 10^{-11} \cdot 1,6180339887}{36 \cdot 10^{-20}}] = 2,9995163 \cdot 10^8 \text{ m/s}$**
And is a Constant-Light-velocity $\bar{c} = \frac{G}{\Phi^3 L_P}$, because all constituents are constant.
Since $G \equiv \sigma \cdot \Phi^3 \equiv \Phi^2 [\bar{c}]$ then $\rightarrow$ The only Force creating velocities in loops is $\underline{G}$.
- 4... **Gravity $\underline{g}$. The Light velocity vector $\bar{v} = \bar{c}$ and is Acting on cave , $\underline{r} = L_P$, and when**
finds Impedance $\underline{m}_g$, becomes the Centrifugal-Force $\underline{F}_g$ of the Cave and it is Equal to
Gravity $\underline{g}$, as Gravity $\rightarrow \underline{g} = 4\sqrt{3} \ln(3) \cdot \pi^2 L_P c^4 = 9,8076754 \text{ m/s}$
Since $G \equiv \sigma \cdot \Phi^3 \equiv \Phi^2 [\underline{m} \cdot \underline{g}]$ then $\rightarrow$ The only Force creating Gravity and masses is $\underline{G}$.
- 5... **Hydrogen cave $\underline{H}$. The Light velocity vector $\bar{v} = \bar{c}$ acting on an-cave , $\underline{r} \neq L_P$, finds Impedance**
 $\underline{Z}_c$ from Velocity $\bar{c}$, and becomes the minimum-Energy - cave in L_P , equal to $\underline{E} \equiv \underline{r} \underline{Z}_c \bar{c} \equiv \underline{h}$,
and is the Hydrogen cave $L_H = \underline{r} = \frac{\underline{h}}{c \cdot \underline{Z}_c} = 2,1127839 \cdot 10^{-11} \text{ m}$ which is the minimum cave in Planck's
length with the max-Energy $\underline{h}$. From the Unit-Stress- Gravity $\underline{g}$ as Energy , $k = E = \frac{T^2}{r^3} = g = \frac{1}{f^2 \cdot r^3}$,
then , $g \cdot r^3 \cdot f^2_P = 1$, which is the Kepler second and constant Unit-law for areas and in this minimum
 L_H -frequency $f = 3,2839982 \cdot 10^{15} \text{ H}$, which is the Hydrogen cave occupying energy $\underline{E} = \underline{h} \cdot f = 13,6 \text{ eV}$.
Since $G \equiv \sigma \cdot \Phi^3 \equiv \Phi^2 [\underline{v} = w \cdot r]$ then $\rightarrow$ The only Force creating Caves and Periods is $\underline{G}$.
- 6... **Electron cave $\underline{e}$. The Natural-frequency $\underline{f}$ in Planck's length for the Primary-Particle**
occupying the less Negative-charge-frequency, is the Electron ,and is from equation solution

$$\frac{w_n}{2\pi} = f_e = \frac{1}{2\pi} \sqrt{\frac{k}{m}} , \text{ or } 4 \pi^2 f^2_e \cdot m_e = k = \pi g \text{ and } m_e = \frac{g}{4 \pi f^2_e} , \text{ where}$$

$$f_e = 3,283998 \cdot 10^{15} / s , \text{ Light velocity } \underline{c} , \text{ is acting on Electron-Unit-Charge } \bar{q} \leftarrow \text{ or ,}$$

$$\underline{G} = \underline{c} \sqrt{2} \bar{q} , \text{ and then Electron-Charge becomes } \bar{q}_{\text{Electron}} = \frac{G}{c \sqrt{2}} = 1,574 \cdot 10^{-19} \text{ C} .$$
Since $G \equiv \sigma \cdot \Phi^3 \equiv \Phi^2 [\sigma \Phi]$ then $\rightarrow$ The only Force creating velocities and Charges is $\underline{G}$.
- 7... **Electromagnetism $\bar{E}$, $\bar{B}$ Using the United Newton-Coulomb Electro-Mechanical Equation**

$q \bar{B}_L = 2\pi.m f$, then The Proton-Uniform-Magnetic-field $\bar{B}_F = \frac{|2\pi.m.T|}{Q_T} f = 1,502766.10^{11}$ Tesla .

The Proton-Resonance frequency $f_p = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}} = 5,26241.10^{17}$ H , and Energy equation

$E = \frac{1}{a^3} \left[\frac{4\pi^2}{c^2} + \frac{L^2}{2m} \right]$ where $L =$ the Spin $S = 5,691952. 10^{-34}$ {Kg/m/s}. Since $G \equiv \sigma.\Phi^3 \equiv \Phi^2 \left[\frac{2S=B}{\pi r^3} \right]$ then $\rightarrow$ The only Force creating Spins and EM-Fields is G .

8... Weak Forces in Proton and Neutron caves . The Electric Force between the **u**-Quarks and **d**-Quarks in Protons and Neutrons becomes from Coulomb law for charges as in **Uniform Magnetic-field**

$\bar{B}_F = \frac{|2\pi.m.T|}{Q_T} f = \frac{2\pi.1,85777.10^{-28} 5,262409.10^{17}}{1,6022.10^{-19}}$ (Kg/Cs) = $3,83389.10^9$ Tesla , in where Uniform MF ,

The cyclotron frequency is independent of the Particle speed and radius . The Coulomb force is ,

$F_c = C \frac{q_1.q_2}{r^2} = 8,9875.10^9$ (Nm²/c²). $\frac{2}{9} [1,602.10^{-19} C]^2 \frac{1}{(10^{-15})^2} = 51,25679$ N x [1Nm = $6,2415. 10^{18}$] =

3,1991925.10²⁰ eV. Since $G \equiv \sigma.\Phi^3 \equiv \Phi^2 \left[\frac{2\bar{B}_F}{\pi r^3} \right]$ then $\rightarrow$ The only Force creating Caves and EM-Fields is G .

9... Strong Forces in Hydrogen-cave From cave $r_H = \frac{h}{c.Z_c} = \frac{G\Phi h}{A.Z_c} = 2,1127839.10^{-11}$ m and from Unit-Energy , $g.r^3.f_p^2 = 1$, the frequency $f = 3,2881322.10^{15}$ H , then the Hydrogen cave-Energy

$L = h.f_N = 6.62607.10^{-34} . 3,2881322.10^{15}$ J / $1,6.10^{-19} = 13,6$ eV . In case of **1-Proton** $[\oplus] \equiv$ An **Ion-nucleus** , then Total-Harmonic-mass $M_T = 1,67.10^{-27}$ Kg .

The Total-Harmonic-Charge $Q_T = 1,6022. 10^{-19}$ C , The Resonance-Cave-frequency f , is

$f = \sqrt[4]{\frac{1}{4\pi^2 m.a_H^3}} = 1,189975.10^{15}$ H . The System $M_T =$ masses , $Q_T =$ Charges creates a

constant Uniform-Magnetic-field of Strength $\bar{B}_F = \left| \frac{2\pi.M.T}{Q_T} \right|.f = 7,7929983.10^7$ Tesla

which is $\rightarrow$ **The Strength of a Non-magneton Neutron-Star** .

Proton is consisted of Two Up-Quark q_u , and One Down-Quark q_d , with masses

$m_u = m_d = m_p / 3 = 5,573.10^{-28}$ Kg , and their Resonance **mass** $M_T = \frac{m_p}{9} = 1,857777.10^{-28}$ Kg ,

and charges $C_{qu} = \frac{2}{3} e = + \frac{2}{3} 1,602.10^{-19}$ C , or $C_{qd} = - \frac{1}{3} e = \frac{1}{3} 1,602.10^{-19}$ C ,with Resonance **charge**

$Q_T = \frac{q_p}{3} = 1,6022.10^{-19}$ C , and for Proton-Ion $q_p = 2.q_u + q_d = 2. \frac{2}{3} e - \frac{1}{3} e = e$.

The Proton-Resonance frequency for **Uniform MF** is $f_p = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}} = 5,26241.10^{17}$ H , and a

Magnetic-field-Strength $\bar{B}_p = \frac{|2\pi.m.T|}{Q_T} f = (Kg/Cs) = 65,7.10^9$ Tesla , i.e.

A Strong-Nuclear-Force with the Strength of a Magnetar ,

The Electric Force between the **u**-Quarks and **d**-Quarks in Proton is from Coulomb law

$F_{u-d} = C \frac{q_1.q_2}{r^2} = 1,9972.10^{-7}$ N , which is the Energy per **Proton** in CERN-LHC, 2015.

Since $G \equiv \sigma.\Phi^3 \equiv \Phi^2 \left[\frac{2\bar{B}_F}{\pi r^3} \right] = \Phi^2.\bar{v}$ then $\rightarrow$ The only Force creating Sub-Caves and EM-Fields is G .

i.e. In Universe exists **ONLY ONE FORCE** , that of Newton-Gravitational-constant-Force **G** which is following the Material-Geometry-Pattern and Cauchy – Euler-Lagrange-Kepler-Newton -Coulomb , Laws of Mechanics such in microcosm as in macrocosm.

The Gravitational force $G \equiv \sigma.\Phi^3 \equiv \Phi^2 . \left[\left\{ \sigma \Phi \right\} \equiv \left[\frac{2B}{\pi r^3} \right] \equiv 2\pi f_p r \equiv w r \equiv \bar{v} \equiv m a = \bar{c} \right]$

10...The Stationary Photon $\bar{v}$. $\left[\bar{f}_n + f_n \right] \equiv \left| \frac{v}{\pi^2.r^4_n} \right| . \left[\bar{B}_n \right] + \left| \frac{v}{\pi^2.r^4_n} \right| f_n$ can use any of the two Storages of

frequencies , by Placing the Storage $\left[\bar{f}_n \right] = \left[\bar{B}_n \right] =$ Energy = motion ,anywhere needed to it and any time can travel with light-velocity . This Property of Photons will be the interest of the Future-Technologies because the Storage , the , n , frequencies , can be **Properly-Prepared**, issuing the Coulomb-equation

$F_{photon} = \frac{[\oplus \leftrightarrow \ominus]}{r^2} = \frac{[\sigma.\sigma]}{r^2} = \left| \frac{\sigma}{r} \right|^2 = \left| \frac{2\pi f}{\Phi} \right|^2 = \left| \frac{w}{\Phi} \right|^2 = \left| \frac{2L}{\Phi \bar{B}} \right|^2 = \left| \frac{\bar{c}}{r.\Phi} \right|^2$, in the same Box $\bar{B}_n$.

This Property is used in Quartz-Crystal , RLC circuits , Photoelasticity etc.

When a Photon travels through an Static-Magnetic-field then $\rightarrow$ The Spectral-lines $\leftarrow$

Split into Multiple-closely-Spaced-lines , because of the Released-Energy , $\left[\bar{f}_n \right]$, into

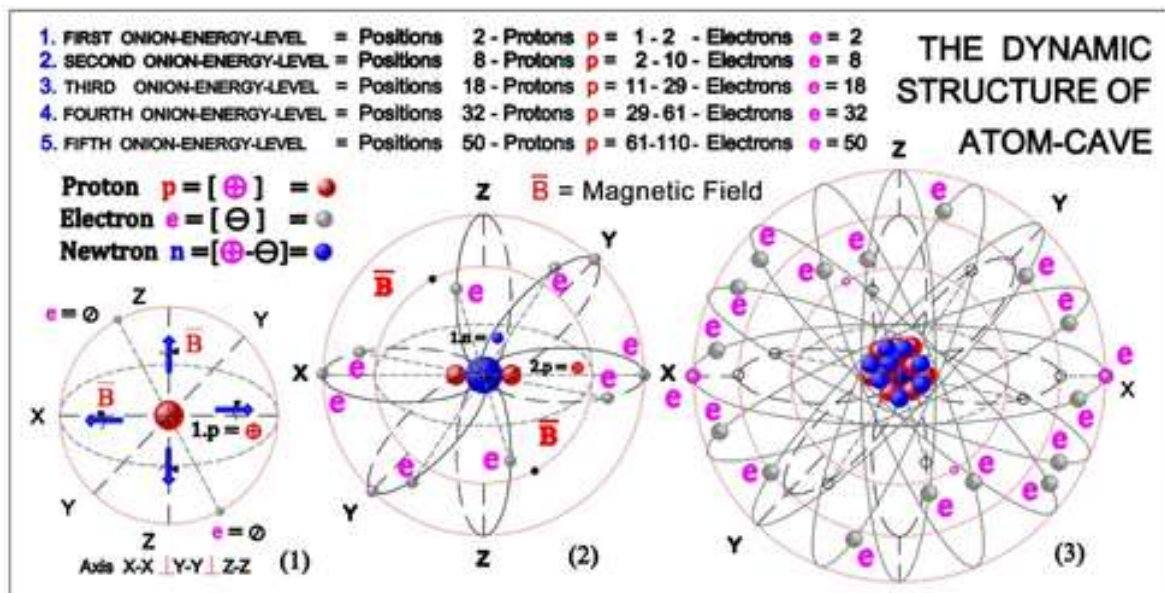
Magnetic-Field , a Phenomenon happening such in Inorganic as in Organic Chemistry .

Because Photon is related to stress σ as , $\bar{v} \left[\frac{\sigma}{2\pi r} + \frac{\sigma \Phi}{2\pi r} \right] \equiv \bar{v} . \left[\bar{f}_n + f_n \right] = \bar{v} . \left[\frac{\sigma \Phi^2}{2\pi r} \right]$ and

$\sigma \equiv \left[\frac{2\pi r}{\Phi^2} \right] . f_n \equiv \frac{f_{ph} . 2\pi . r}{\Phi^2} \equiv \frac{w . r}{\Phi^2} \equiv \frac{v}{\Phi^2} \equiv \bar{c} \frac{1}{\Phi^2}$, is dependent on Position and velocity ,

It is a Way , of Information from , f_n , and from Storage , $\left[\bar{f}_n \right]$, in Nature .

- 11.. In order that a Material-Point A , moves to another Material-Point B , a Force F must Push Point A to Point B . This happens to Coulomb-law of Charges and Forces , and also to the Magnets where The $\oplus$ Charge moves to the $\ominus$ Charge . From Voltage of cave r , $V_r = C \frac{q_1 \cdot q_2}{r}$ then $\rightarrow V_r = F_c \cdot r$ or Interference $[\oplus \rightarrow \ominus]$. These Charges are Breakages from the Collision of any Two-Opposite Velocity-Vectors into an Equilibrium **Physical -Velocity-Whirl** , where **The Thrust** on Charges is the Circular-Position of these Charges $, +, 0, -$, on the [STPL mechanism] , and where exists , $\pm \text{Charge} \equiv |s| \equiv |\vec{v}|^2 \cdot [91]$
- 12.. In case of an **Oscillating-Inner-System** of , w_R , with all , **The-Diagonal – Linear - Electromotive - Coulomb forces** F_c , Due to the $\oplus$ Charges effecting on the $\ominus$ Charges , **IS RESONATED with That of Angular-Momentum** , or of **SPIN $\vec{S}$** , becoming from The-Tangential-Electromotive-Forces , **THEN , Coulomb - ELECTROMOTIVE-FORCES Become Equal to Centrifugal - Inner-Forces** .
 $\rightarrow$ The **CENTRIFUGAL - FORCE** , which is created from the Rotated System of the Tangential-Forces , **PUSHES** the Inner **COULOMB-FORCES** created from Opposite $\pm$ charges , **OUTWARDS-SYSTEM** . The **Centrifugal-Coulomb-Forces ARE The Elementary-Particles** and **Tangential-Forces IS Spin $\vec{S}$** $\leftarrow$ i.e. Electromagnetic Forces become from the Oscillation of , $\oplus$, $\ominus$ Charges $\equiv$ Conductors of caves , and are dependent on the Positions these occupy in Conductors . It is shown in $\{ K = \text{Stability of } S\_A-S , \}$ that The Stability of the, **Space Anti-Space Circuit** , exists by their $2^2 \cdot 3^2 = 36$ **Positions = Conductors**



of the Two charges , $\oplus$, $\ominus$, and of the Three elements $\rightarrow \{ \oplus , [\oplus \leftrightarrow \ominus] , \ominus \} \equiv [+ , 0 , -] \leftarrow$ only .

Figure-16- : The New Energy-Atom-Cave Pattern , In minimum Energy-Space , $p \leftrightarrow e$:

5-f... The New Electromagnetic-Structure of Atom .

From the **Set of infinite Rest** , $[+]$, $[-]$ or **moving Units $\equiv$ Charges** , the electrons $[-]$, and choosing **Two of them** in each Orbit **for Stability** , is found Mendeleyev - System and the following New-Proposition of Atom-Structure as follows ,

- 1.. Hydrogen-Cave becomes from Gravity , g , entering the minimum cave a of , $g \cdot a^3 \cdot f_p^2 = 1$ relation , with the minimum Energy $-13,6 \text{ eV}$. The Presence of a **Proton-Positive-Charge** $\bar{q}_p \equiv \oplus$ creates in cave a the UMF $\equiv$ **Uniform-Magnetic-Field** $\bar{B}_p$, [**The-Material-Space**] as equation $\bar{q}_p \cdot \bar{B}_p = 2\pi \cdot m_p \cdot f_r$ which is the **Storage of Energy** in Hydrogen-Cave . In this UMF , Charges $\bar{q}$, Orbiting in a Plane Normal to $\bar{B}_p$, their cyclotron-frequency f_n is independent of the Particles-speed and radius allowing the acceleration of Charged Particles as are the , Electrons $\rightarrow \bar{v}_e = 2\pi \cdot f_e$ and , Dual-Photons $\rightarrow \{ \bar{c} \cdot \bar{f}_n + \bar{c} \cdot f_n \}$.
- 2.. The Presence of a **Negative-Electron-Charge** $\bar{q}_e \equiv \ominus$ in the Uniform-Magnetic-field $\bar{B}_p$ experiences a Force , **The-Lorentz-Force** , when entering the Magnetic-field and since it occupies the constant-energy , $\bar{q}_e \equiv \frac{G}{c\sqrt{2}} = 1,59 \cdot 10^{-19} \text{ C}$, then follows a **Complete-circle**

The-Material-Space is $\bar{B}_p$, and thus defines the Number of the Material-Points in Spaces as well as the Material-number **Zero** which is now included.

The presence of Photons with this Dual frequency $\{ \bar{c} \cdot \bar{f}_n + \bar{c} \cdot f_n \}$, Storage + Energy allows The **Work** $\equiv$ Energy produced by **Electrons**, be Stored in **Photons – Storages**.

- 3.. The Heap of Masses $m = M_T$ follow Newton laws, The Charges $[\oplus, \pm \bar{q}_p, \ominus]$ follow the Coulomb law, The Zero-Electron Charges $[\oplus \leftrightarrow \ominus] \equiv \pm 0$ the Material-Geometry Rules, the Arrangements, **Positions** n , the Material-Geometry Rules of Combinations and Permutations as follows,
 - a.. The **Three Elements** $\equiv$ Digits of Material-Geometry are $\{ \oplus, [\oplus \leftrightarrow \ominus], \ominus \} \equiv [+ , 0 , -]$ The Positive, The Zero, The Negative with their Global meaning.
 - b.. The **Permutation**, *arrangement*, Per-two of the only Two-Elements is, $P_1^2 = 2$, and these are the two as $\rightarrow [\oplus, \ominus]$ and $[\ominus, \oplus]$. The number of **Permutation** with **Repetition** of the **Two** Elements in $n = 2$ which is the Sub-Spaces as $P_{Elements}^{Moulds} \equiv RP_1^2 \equiv 2$, and this because Material Geometry numbers do Not begin with zero $[\oplus \leftrightarrow \ominus]$, as in E-Geometry.
 - c.. The Material-Spaces for 1- **Point** $\equiv 2$ Elements, A **Vector** $\equiv 4$ Elements, A **Plane** $\equiv 6$ Elements, A **Volume** $\equiv 8$ Elements, A **Space1volume** $\equiv 10$ Elements, A **Space2volume** $\equiv 12$ Elements, A **Space-n-volume** $\equiv 2n$ Elements in Regular Solids, Analysis in [63]
 - d.. The number of **Permutation** with Repetition of the **Two-Elements** in the **n-Spaces** and in the Two **Sub-Spaces** is $P_1^2 \cdot RP_2^n \equiv 2n^2 \equiv$ **The Number of Electrons in Each-Space**, A relation defining the number of Electrons in Orbits and The-Mendeleyev-Atoms-Table. Nature follows the Quantum-Space-Positions logic for each element agreeing with M-G, which is the Objective reality such in Space as in motion which is equal as Energy.
 - e.. The number of **Permutation** of the **n-Spaces** and of Repetition in the **2-Sub-Spaces** of the **Two-Elements** $[\oplus, \ominus]$ is equal to $\rightarrow P_1^2 \cdot RP_2^n + P_1^2 \cdot RP_2^{n-1} + P_1^2 \cdot RP_2^{n-2} + \dots \equiv 2[n^2 + (n-1)^2 + (n-2)^2 + \dots]$, **Onion Summation**, $\sum_1^n \left[\frac{n(n+1)(2n+1)}{3} \right] = 2, 10, 28, 60, 110$, denoting thus the Total-number of Positions in Hydrogen-Caves as an Additional-whole.
 - f.. In Fig-16, **The Elements** $\rightarrow$ **Proton** $\equiv \oplus$, **Electron** $\equiv \ominus$, is **The-Energy-Part of Atom**, while Neutron $\equiv [\oplus \leftrightarrow \ominus]$, is **The-Space-Part of Atoms** as $0 \equiv [\oplus \leftarrow r \rightarrow \ominus]$, which both consist, **The Energy-Space-Universe - Model**. Markos 3/12/2019.

The Structure of Atom - Figure -16 :

- In (1) is**, The **Point-Space-Cave** with **One-Charge-mass-Nucleus** in Hydrogen-Cave, and Charge - Orbit-Position-Elements $m = 0$, consists the **Proton-Ion** of Hydrogen-cave of Uniform-Magnetic-field-Strength = 4,1464883 Mega-Tesla of Energy is $2,03.10^8$ J and with the **Cyclotron-Frequency** $f_R = 1,189676.10^{15}$ H,
- In (2) is**, The **Vector-Space-Cave** $m = 1$, with **Two-Nucleus-masses** of **One-Charge** and with $2m^2 = 2$ Permitted-Orbit-Positions, per 2 Electrons for Stability, $\rightarrow$ consists the first, **3**, Perpendicular-Plane-Permitted-Positions in Cave, for the $\rightarrow$ **Lissajous – Eight - Shapes**. This happens because of the **Linear-Vibrations**, $[\ddot{x} + w^2 x = 0]$, of **The three-masses**, which Occur on the Two **Perpendicular each other**, Line-Vectors of, $x \perp y$, in Plane, above Shapes which are for,
- a.. Difference of Phase $d_\phi = 90^\circ$ emission is $\rightarrow$ The Eight-Shapes ∞ .
 - b.. Difference of Phase $d_\phi = 0^\circ$ emission is $\rightarrow$ The Ellipse-Shapes $\propto$.
 - c.. Difference of Phase $d_\phi = 45^\circ$ emission is $\rightarrow$ The Double-Saddle-Shapes $\cdot 8, \infty$.
- For **One-Nucleus-mass** and **One-Orbit-mass** is produced the **Atom-Nucleus-Orbit-Hook** + Plane +, Prior [ANOH], which accumulates the Nutation-frequency used for the Atoms Bonding. For any two masses in Nucleus and one mass on Orbit, *three masses problem*, issues the $x \perp y$, Plane giving the Transverse Electromagnetic waves.
- In (2) is**, The **Plane-Space-Cave** $m = 2$, with $[2+1] = 3$ -**Nucleus-masses** of **2-Charges** and with $2m^2 = 8$ Permitted-Orbit-Positions, per 2 Electrons for Stability $\rightarrow$ consists the Second **Onion Plane-Energy-Volume**, Enveloping the Priors, **Vector-Space-Cave** - m + Plane + Vector + Point +, Prior [ANOH], and For the **n-Proton** $[\oplus]$, **n-Electron** $[\ominus]$, **n-Neutron** $[\oplus \cup \ominus]$, issues the logic for Total number of Positions in the Hydrogen-Caves.
- Onion Summation**, Issues under the condition of the Three-masses which consist a Plane.
- In (3) is**, The **Volume-Space-Cave** $m = 3$, with $[14 \times 2] = 28$ -**Nucleus-masses** of **11- Charges** and $2m^2 = 18$ Permitted-Orbit-Positions, per 2 Electrons for Stability $\rightarrow$ consists the Third **Onion Space-Energy-Volume**, enveloping the Priors, **Vector-Space-Cave** - m + Volume + Plane + Vector + Point +, Prior [ANOH], and for The Total Positions cave-number is filled with the **Permutation** number with Repetition of the **Two-Elements** in the **n-Spaces** and the Two **Sub-Spaces** which is $P_1^2 \cdot RP_2^n \equiv 2n^2$, $\rightarrow 28$, referring and all the Prior.

In (3) is, The m^{th} -Volume-Space-Cave with, $m = m$, with $\sum_1^n [m_n - 1]^2 = M$ -Nucleus-masses of $\{M/2\}$ Charges and with $2m^2$ Permitted-Orbit-Positions, per 2 Electrons for Stability, and consists the $\{m^{th} - \text{Onion-Space-Energy-Volume -Cave}\}$, enveloping all the Priors $\rightarrow$ Volume + Plane + Vector + Point+, $P - [ANOH] \leftarrow$ with the **Three-Elements Space $\oplus$, Anti-Space $\ominus$, Material-Point $[\oplus \leftarrow r \rightarrow \ominus]$** , of **Material-Geometry**.

Because Magnetic field $\bar{B}_F$ is **Independent** of the **Electron-velocity**, v_e , and of the Cave radius, r , therefore the rotating Electrons are not accelerated in Magnetic-Field, but their Strength only is **Dependent on frequency**, f , and of Charge, q only. Because of this Velocity-lag allows the in Hydrogen-Storage without Inverse Impedance which exists in M-Point.

Above Property makes the Hydrogen-Cave a **Uniform-Magnetic-field**, $\bar{B}_F$.

Photon was proved to be a Material-point in cave, r , where its **Inner Storage is the Stationary-Standing-wave** the Electromagnetic - Wave $[E^2 + H^2] = 2(2r).c.\sin 2\varphi. [\varphi = \frac{\bar{B}}{\Phi}]$

with n -Lobes representing the **Normal mode vibration** with frequencies $f_n = n.f_1 = \frac{E}{h} = \frac{n.v}{4r} = \frac{n\sigma}{8r} [1 + \sqrt{5}] = \frac{2n\bar{B}}{\pi^2 r^4}$, and **Outward the Storage is the Electromagnetic-Wave**, as $\rightarrow \{[E^2 + \mu B^2] = 2.\lambda.c.\sin.2\varphi. [\varphi = \frac{\bar{B}}{\Phi}]\} \leftarrow$ where **Particle $2r = n\lambda$, Cave, r ,**

And is The **Electromagnetic Energy - Storage**, and Electromagnetic Radiation, E, B , is the **Wave Conveyer of Cave, r , with frequency $f = \text{Energy } E / \text{Planck-constant } h$** , or $f = E / h$

which Duality-Photon-velocity is $\bar{v} \equiv \bar{c}. [\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}] \equiv \bar{c}. [\frac{\bar{f}_n}{f_n} + f_n]$ (f-v)

From Force-relation $G = \sigma A = (2\pi f r) \frac{A}{\Phi} = w r = \bar{c}. \frac{A}{\Phi}$, i.e. Action of $G \rightarrow$ on $\bar{c}$ and,

following relation $\sigma \times \Phi^3 \equiv G$, from Energy-force F_g in, $r = L_P$, Planck's scale of mass

$m_g = J.w^2$, where angular-velocity $w = \frac{c}{r}$ and, from 3-Dimensional $[2^3 = (\oplus \leftrightarrow \ominus)^3]$

Impedance g_z , of Space, ln(3), and Anti-Space, $\pi\sqrt{3}$, then the Centrifugal-Force is

$$F_g = \bar{g} = m_g \left[\frac{c^2}{r} \right] = m_g \left[\frac{c^2}{r} \right] = J w^2 \frac{c^2}{r} . g_z = \left[\frac{\pi r^4}{2} \right] . \left[\frac{c}{r} \right]^2 . \left[\frac{c^2}{r} \right] . 2^3 . \ln(3) . \pi\sqrt{3} \} = 4\sqrt{3} . \ln 3 . \pi^2 r c^4 = 9,8076754 \text{ m/s}, \text{ which is a Force acting on } r = L_P \text{ mass.}$$

i.e. Gravity $\bar{g}$, Is The effect of, G Force, on light-velocity $\bar{c}$, In the 3-Dimensional Impedance of Space ln(3) and Anti-Space $\pi\sqrt{3}$ in 2^3 , Planck-length $L_P = r$, ...(g)

A wide analysis of what is Impedance in Propagating-Photon $\bar{v} = \lambda_n . f_n = \bar{c}. [\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}]$

= Energy = $\bar{c}. [\frac{\bar{f}_n}{f_n}] + \bar{c}. f_n \equiv \bar{v}. \{ \frac{\bar{f}_n}{f_n} + f_n \} \equiv \left| \frac{v}{\pi^2 . r^4 n} \right| . [\bar{B}_n] + |\bar{c}| f_n \equiv \text{Particle + Wave, as in Material-Geometry [57-58].}$

G ... THE GRAVITATION CONSTANT G.

1-g.. The Gravitation Constant G and Photon :

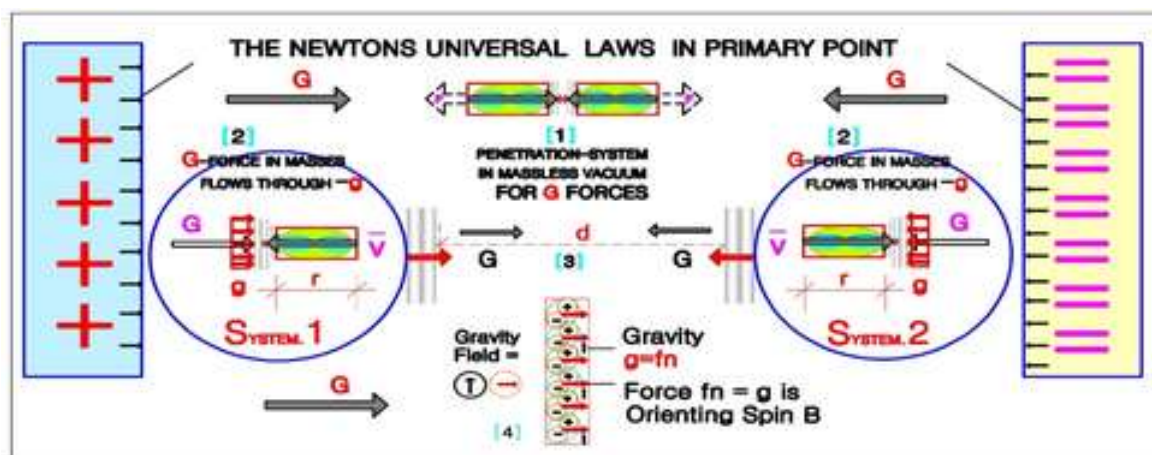


Figure – 17. The Newton's Universal Laws in **Primary-Material-Points** of Cosmology :

Above figure, is consisted of Two-Primary-Opposite-Spaces, $\{+\} \rightarrow \leftarrow \{-\}$, The Poles with Infinite Points for Parallel-lines such that, G , is a **Uniform - Pointy-Force**. The

STPL -Mechanism is the **mould** for *constructing the Elementary Particles* while Material Point , Photon , and Photon - Charge with Light velocity , c , the Gravity , g , Electrons , e , and , e^- Charge and Hydrogen cave are by the **effect of Gravitational constant G** Force .

In universe **exists Only-One-Force , The Gravitational-force G** , which is constant in all universe , therefore being constant , becomes from an Conservative –System . In Mechanics , a force F produces the Work W , when it removes the Point of its action from a Position , A , to another Position , B , as the Work equation , $W = F \cdot ds$, where $ds = |AB|$ displacement .

This right definition automatically defines that All this Work done and exists in universe , **as Space and Energy** , has been Produced by this Unique force G only . It was proved that this force is ,

$$\text{Gravitational force } G \equiv \sigma \cdot \Phi^3 \equiv \Phi^2 \cdot [\{\sigma \Phi\} \equiv [\frac{2B}{\pi r^3}]] \equiv 2\pi f_p r \equiv w r \equiv \bar{v} \equiv m a = m g = \bar{c}]$$

It was prior proved , that one of the smallest **Energy-Unit of Space** is that of Planck's length , and **it is an Energy-cave** , and this because from equation (s) , Space $s = 0$ and Type- $k = 1$. Energy which is motion is kept in the Massive-Box- B_p called **Photon** or **Energy-Storage** .

The velocity of Photon is $\bar{v} \cdot [\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}] \equiv \bar{v} \cdot [\frac{\bar{f}_n}{\bar{f}_n} + f_n]$, i.e. a Dual motion as ,

$$1.. \text{Energy-Storage } S \equiv [\oplus \leftarrow r \rightarrow \ominus] \equiv \text{Particle } [\bar{v} \cdot \frac{\bar{f}_n}{\bar{f}_n}] \rightarrow [\bar{v} = \bar{c} = \lambda \frac{f}{\phi}] \rightarrow \text{i.e.}$$

a **Stationary Standing - Wave** $\rightarrow \{S \equiv [EM-R \equiv f_{1=N}, f_2, f_3, f_D, f_n = w^2]\}$.

$$2.. \text{A moving-Energy where , Motion } M \equiv [\bar{v} - \text{Vector}] \equiv \text{Wave } [\bar{v} \cdot f_n] \equiv [f_1 = (E^2 + H^2) = n \frac{\Phi \cdot \sigma}{2\pi r} = \frac{\bar{B}}{\pi^2 r^4}] \rightarrow \text{i.e. a Propagating Wave } \{W \equiv EM-R \equiv [\epsilon E^2 + \mu B^2] = 2 \cdot \lambda c \cdot \sin 2\phi [\phi = \frac{\bar{B}}{\phi}]\}.$$

In both cases Photon - Wave carry the in Box , Golden-ratio-frequency Φ , Everywhere and Anywhere such in microcosm and as in macrocosm giving Energy and Information .

Gravitational force G , in order to communicate with another velocity-vector $\bar{v}$ which is axial also , **is needed to Have a Reaction to this motion** , i.e. Gravitational-Energy G is acting on Stress $g \rightarrow \bar{g}$, through the Waves $f_n \rightarrow$ on [Material-Point Unit Spin $S \approx g$] . The Force G **is Spread in a Layer** a **Field** which is the Stable –Ocean of the Spins S , becoming from the *Periodic motion* , and thus Communicates through Stress g on Spins $\bar{S}$ as Stress in all the inters .

It was proved that The **Electron-Spin** is $\rightarrow S/2 = 1, 4603748 \cdot 10^{-34}$ Joules $\leftarrow$ which is the same to the Material-Point-Periodic-motion-Spin . **From the Bonded Tack - Geometry** ,

- 1.. **A Charged-Particle** , is a Particle with an electric-charge , $\oplus$ or $\ominus$, which Produces an Electric - field $\bar{E}$, which exerts a force $\bar{F}$ on other charged Particles $\bar{e}$. Positive charges $+\bar{e}$ accelerate in the Left Direction of the Field $\bar{E}$. and Negative charges $-\bar{e}$ accelerate in the Opposite $\rightarrow$ Right-Direction to that of field $\bar{E}$.
- 2.. **A moving Charged-Particle** , $\oplus$ or $\ominus$, Produces a Magnetic-field $\bar{B}$, which exerts a Force $\bar{F}$ on other moving charges $\bar{e}$. The Force $\bar{F}$ of these charges is always $\perp$ Perpendicular to the Direction of their Velocity vector , so the *Velocity-magnitude* does not change , and the *Direction* only of the Velocity-Vector changes .
- 3.. **An accelerated-Charged-Particle** , $\bar{\oplus}$, Produces an Electro-Magnetic-Wave $\bar{E} \perp \bar{B}$, and are *Perpendicular each other* , which are Electric and Magnetic fields travelling through empty Space with the speed of light , c , and which is as an Charged - Particle which oscillates about an fixed and equilibrium Position . This oscillation frequency , f , is the same to the E-M-Wave and which wavelength $\lambda = c / f = c T$. The **E-M-Waves transport Energy** through Space , and may be delivered any distance away from the Source . This repelling force becomes from the beyond the Standing-Wave structure , where charges , $\oplus$ and $\ominus$, are Placed at the Two nodes of the wavelength λ .
- 4.. **Accelerated-Charges** produce , *Changing Electric and Magnetic-fields alternately* , which leads to the Propagating-Electromagnetic-Waves . In Zero-Periodic-motion $\{\oplus \rightarrow d \leftarrow \ominus\} = 0$ of a Distance , d , the motion as Pressure CANNOT act instantly between the two Stationary constituents , unless a Mean d , is mediated to transfer the Pressure of the $\oplus$ constituent , to the $\ominus$ constituent . This Mean is a Stationary-Primary-Material-Point $[\oplus \leftrightarrow \ominus]$ which is a **Standing-Wave-structure** becoming from $\{\oplus, \ominus\}$ Charges at the **Two nodes** of the wave's wavelength , Producing an **Constructive wave interference** , $\oplus \leftrightarrow \oplus$, or , $\ominus \leftrightarrow \ominus$, and or Producing an **Destructive wave - interference** $\{\oplus \rightarrow d \leftarrow \ominus\}$ where $d \equiv$ the nodes distance in wavelength $\lambda = c / f$. Because $\oplus$ charge exerts a Force $\rightarrow$ against $\ominus$ charge with Zero-Periodic motion and which two constituents equidistant , $d = n \cdot [\oplus \leftrightarrow \ominus]$, $n = 1, 2 \dots r$, then the two Charges create an Electric and an Magnetic field Perpendicular each other $\uparrow \leftrightarrow \downarrow$ which is the **Electric-Force** and the **Magnetic-Force** of the Standing wave structure .

This is the Way of Particles and Forces creation [91] . Moreover ,

There is Not Vacuum , instead exist the **Infinite-Material-Points** created from the Periodic excitation

and which are **Spinning in Opposite-Pairs for Stability**. The Un bonded-Force, **G**, or **Gravitational constant**, **G**, was shown to be the **Electric-Field-lines**, i.e. **The SPACE** is a **Huge-Electrostatic-Magnet** becoming from the **Infinite-Dipole-Opposite-Primary –Charges** which is **THE-ENERGY- PART**, of the Two-Primary-Points $\oplus$ to $\ominus$, [82-86]

5.. The Spinning in Opposite-Pairs for Stability, Produces the filling Gap with the **Double Ocean** of the **Pointy-Spinning-Material-Points**, which become from the **Stationary-Material –Points**, **Photons** or **Electrons**, while from the **moving-Energy-Storages Duality-Photons** $\vec{v} \cdot [\vec{f}_n] + f_n] = |\frac{v}{\pi^2 \cdot r^4_n}| \cdot [\vec{B}_n] + |\vec{c}| \cdot f_n$

The condition for **Irrotational Energy** is $\rightarrow \nabla \times \vec{B} = \nabla \times \vec{S} = 0$, or $\nabla \times \vec{B} = \nabla \vec{r} + 2\pi m f \cdot \vec{a} = 0$, and $\vec{r} = \pm 2\pi \cdot m \cdot f \cdot \vec{a}$. Vector $\vec{r}$, occupies Both directions for Rotational - equilibrium, i.e. **The vector** $\vec{r} = \pm \vec{B} \equiv \vec{S}_n = 2\pi m f_n$, and $f_n = \frac{B}{2\pi m_e} = \frac{E}{h}$, is the **Stationary-Filling-Ocean of the Spinning-Gravity-Material Point**, in the called **Empty-Space**, with frequency that of Material-Point $\rightarrow f_n = n \cdot f_1 = \frac{E}{h} = \frac{n \cdot v}{2\pi r} = \frac{n\sigma}{4\pi r} [1 + \sqrt{5}]$, and from $v = w \cdot r = 2\pi f \cdot r$, then $f_n = v / 2\pi r = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\sigma \cdot \Phi}{2\pi \cdot r_n}$, where $v = \sigma \cdot \Phi$, and Spin $S_n = \vec{B} = J \cdot w = \pi^2 \cdot r^4 \cdot f_n = e$

2g.. The Electron and Photon charges:

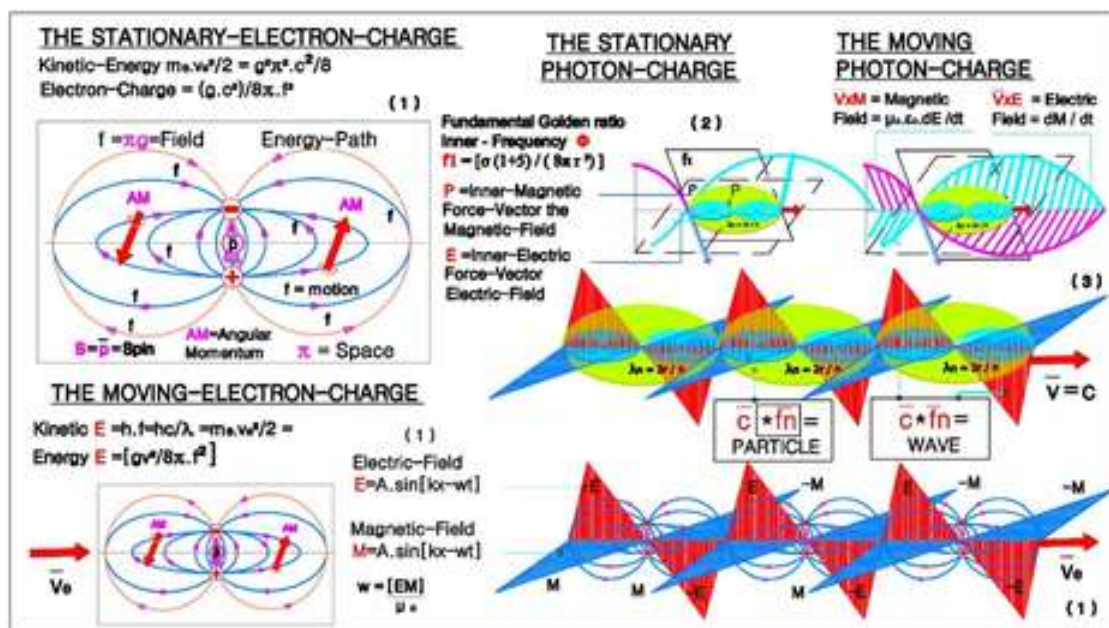


Figure 18. Conservation of motion $\equiv$ Energy in the Primary-Material-Point-Field-lines :

Photon $\equiv$ Energy $\equiv$ motion / T $\equiv (\frac{v}{2\pi r}) \cdot [\sigma + \sigma \Phi] = \vec{v} \cdot [\frac{\sigma}{2\pi r} + \frac{\sigma \Phi}{2\pi r}] = \vec{v} \cdot [\vec{f}_n] + f_n] =$

Moving - Storage $\rightarrow [\vec{v} \cdot \vec{f}_n] \leftarrow +$ Moving-Frequency $\rightarrow [\vec{v} \cdot f_n] \leftarrow \equiv$ Material-Point i.e.

The Energy produced in Photon-Cave is consisted of **Two-moving-Storages**, which travel. The Stationary-Charged-Particle is from equation, $g \cdot f^2 \cdot \pi^3 = 1$, where π is the Closed Space, πg , is the Stationary-Electric-Lines, and $f_1 = \sqrt[2]{g^{-1} \pi^{-3}}$, the motion = Energy = **the Stress** in the Two and Opposite-Spaces, $[\{ + \} \rightarrow \{ - \}]$, or in the consisted Poles, with Infinite Points and Parallel-lines such as **G**, which is as An-Uniform-Pointy-Force. Electrons can be Spinning clockwise or anti-clockwise and Propagate on a Spiral trajectory. A true definition of what is Electric-Charge and Electricity based on above follows.

In [1] **The-Stationary-Electron-Charge**

$$\text{Becomes from E-equation} \quad \bar{q} \equiv \frac{m_e c^2}{2} = \frac{g}{4\pi f^2_e} \left[\frac{c^2}{2} \right] = \frac{g c^2}{8\pi f^2}$$

while for Photon is directly from $G = F = \sigma A = (2\pi f r) \frac{A}{\Phi} = w r \frac{A}{\Phi} = \vec{v} \frac{A}{\Phi} = \sigma \Phi^3$, which is a straight-line Voltage. Since Energy is produced from motion, which is the continuous removal of $[\{ + \} \rightarrow \{ - \}]$ and because it occurs in Closed-loops, *The Electric-Field-lines are Straight-lines, in Space Φ and Energy*

Field σ and when these Pass from g ocean then continue to be *Straight-lines*, and this because Total-work $W = F \cdot s = [F \perp s] = 0 = h f = 0$.

The Geometry of cave (Tack-Geometry) controls the Electric-field and the Stability from g , while equilibrium from, $g f^2 \pi^3 = 1$, and created from the two opposite Angular Momentum vectors, M_u, M_d , at distance, r , thus is created the **E -Spin** as $2S = M_u \times [\{+\} \rightarrow \{-\}]$, and is acting on $[\{+\} \rightarrow \{-\}]$ axis.

i.e. The Stationary- Electron - Charge is the Storage of $r \equiv L_p$, cave in-where the Space and Anti-space, as πg , and as Stationary-Electric-Lines are creating Potential-Energy P_E , with such Geometry that, **to exist from the linear-motion are stored in the form of Dipole-Rotation with a changing-Spin, S, and of frequency $f = 1/T$ in the min-cave**. Here is cleared that frequency $f_e = B / (\pi^2 r^4)$ of Electron is Energy as angular velocity vector motion in r cave, and this is because in cave exists **the Natural-Frequency $f_n = \sqrt{g^{-1} \pi^{-3}}$** , of cave in Electric-Field-lines $E = g \pi$. Photon Frequency becomes from the Isochronous motion $w = \frac{2\pi}{T} = \frac{g}{4r} = 2\pi f$ which **Amplitude is Independent of motion**, and its velocity $\bar{v} = [\frac{G\Phi}{A}]$, is

Dependent on Impedance Z_p of Space-Anti Space A only.

In [2] the Electrostatic Unit of Charge $\bar{q}_p$, the Quantum of All $\rightarrow$ which when concentrated at Point $\{+\}$ and placed at a unit distance from an equal and Opposite concentrated quantity $\{-\}$, $\rightarrow$ and

Is the Pulling with a Unit-force. Mass m_e is the reaction to this Inner motion of $[\{+\} \rightarrow \{-\}]$ and consists the **Granular- Storage of Energy motion**, which is vibration in a closed loop, and it is a measurable Physical-Quantity denoting the Geometry of Electron in r cave, and Periodic motion. The Geometry of the Periodic motion issues the same such as for Electron and for Material Point

with different cave and one-frequency, *the Natural*, as $f_e = \frac{(1 + \sqrt{5}) \sigma}{4\pi r} = \frac{\sigma \Phi}{2\pi r} = \frac{\bar{B}}{\pi^2 \cdot r^4}$

Electric-current is then, The flow of the Electric-Charges and which is the moving-quantity of Charges. Since **Electrons** and **Electric Charges** exists in, $g \pi$ **loop-level**, therefore IS the Property that controls all **Interactions between Bodies** through these **Electrical-forces**.

In [2] The-Stationary-Photon-Charge is the case of Material Point with **Periodic Orbital motion** where issues the **Tack-Geometry** i.e. the tracks of the Electric-lines Pattern are closed loops and not straight-lines, and also because of the Voltage between the ends, is created the motion as an **Eternal rotation** of the $[\oplus]$ constituent towards $[\ominus]$ constituent, [The opposite issues for Rotational motion where in the **Moving - Photon - Tank** and because of Stress, σ , is created the Centrifugal-Force F_f]. and

the velocity $\bar{v} = [\frac{G\Phi}{A}]$. because $f_n = \frac{\bar{B}}{\pi^2 \cdot r^4} = \frac{\sigma^2 \Phi^2}{4 \cdot \bar{B}}$

so, Stress $\sigma = 0 \rightarrow \sigma$, and $\bar{B} = \text{Angular-Momentum} = \text{AM}$ independent of σ .

AM, and Spin is equal to $\text{AM} / \text{Unit-Area} = \text{AM} / \pi$, and because of the Closed **One-way loops**, **Spin is either Positive or Negative** and is $\rightarrow$ Electric-Charge $\bar{E} = \pm \text{AM} / \pi = E\text{-Spin} = \text{The } \pm \text{ Electron}$.

Above Spin disappears the ERP Paradox because is extended and actually is filling up the entire universe. These Stationary-Particles are permanently entangled, with Wave packets becoming from M-P-Photons, which Orientate and Re-orientate their Spins.

In [3] the The-Moving-Photon-Charge Is consisted of the above **Energy-Storage**, the, g in **min-cave**, occupying **All Properties of the Stationary-Electron-Charge** and **additionally** the Kinetic-energy

$E = \frac{m_e v^2}{2} = g \cdot v_e^2 / 8\pi f_e^2 = \bar{q}_e V = h \cdot f_e$, and $g \cdot v_e^2 = 8\pi h \cdot f_e^3$, or

$[v_e^2 / f_e^3] = 8\pi h / g = \text{constant}$, or $v_e^2 / f_e^3 = k$, and $v_e^2 \cdot T_e^3 = k = \frac{v^2}{f^3} = f^3 \left(\frac{T}{\lambda}\right)^2 = f^3 \cdot \left[\frac{\pi \lambda}{f}\right]^2 = k$, i.e.

The **Electron-velocity squared** to the **Electron's - cube Frequency** is constant, following the Orbit Unit-Energy equation $k = f_e^2 a^3$, and equal to the Inverse f squared to the **Electron's-cube-Frequency** in wavelength λ , interchanged and keeping light-velocity $\bar{c}$ without any other Force acting on them.

This Kinetic-Energy creates angular velocity $w = 2E/B = \frac{m_e v^2}{B}$ and the Inwards transverse

Electromagnetic-Waves, $E \perp M$, travelling with v_e , inner velocity as

$E = A \cdot \sin[kx - wt]$ and as $M = A \cdot \sin[kx - wt]$, and $E = M = A \cdot [1 - \sin wt]$, since $\sin kx = 0$.

i.e. The Moving-Electron-Charge is The Electromagnetic-Wave, $E \perp M$, which carries the Stationary-Electron-Charge, and which is The STORAGE of, g , in min-cave, in-where the Potential-Energy P_E , as linear-motion in $g \equiv r$ cave is stored in the form of Dipole-rotation, *Angular-momentum due to curved motion*, with Spin, S , directed from $\{-\} \rightarrow \{+\}$ and to the G-Primary Direction of frequency $f = 1/T$, and which is the Source in cave r .

3-g.. The Material-Geometry and Physics in Chemistry

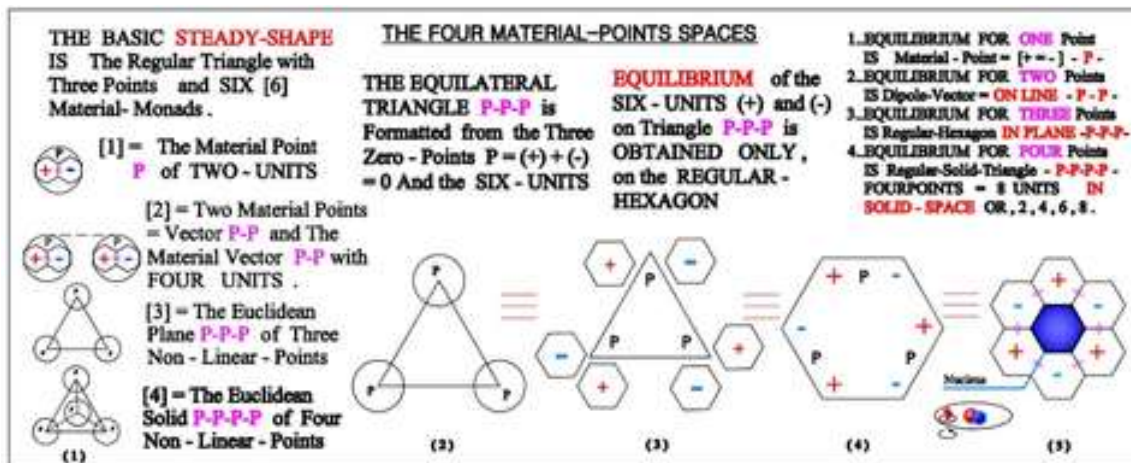


Figure – 19 - : The Relation of Euclidean to Material-Geometry in Three-Dimensions .

In (1), The Euclidean Geometry , E-G, is defined on the **Number of Points** which can define the Spaces Idepended of any other restrictions , i.e.

The **One-Point** in E-G is defining **One-Material-Point-Space** , The One M-P.

The **Two-Points** are defining the **Line-Segment-Space** , The Line-Segment M-P.

The **Three-Points** are defining the **Plane-Triangle-Space** , The Plane-M-P.

The **Four-Points** are defining the **Volume Tetrahedron-Space** , The Volume-M-P.

The **Five-Points** are defining the Volume **Regular Pentahedron-Space** , the SV-M-P.

and so on , representing the **Steady-Stable-Regular** Geometry-Formations.

The corresponding to the **Material-Geometry-Units** are for :

- 1.. One-Point → Two-Units , $[\oplus], [\ominus]$ with Dimension as , **the Material-Vector** $[\oplus \rightarrow \ominus]$
- 2.. Two-Points → Four-Units , $[\oplus], [\ominus]$ with One Dimension as , **the Material-Line**
- 3.. Three-Points → Six-Units , $[\oplus], [\ominus]$ with Two Dimension as , **the Material-Plane**
- 4.. Four-Points → Eight-Units , $[\oplus], [\ominus]$ with Three Dimension as , **the Material-Volume**

Keeping **the Property of Edge-Points** to be the Vector $\oplus \rightarrow \ominus$ then **Bond is the Potential** to the **Unique-Steady-Stable-Regular** Material-Geometry-Formations.

In (2-3-4-5). All Units in Vectors follow Quaternion $q = [s + \bar{v}Vi] = \overline{AB}$ Properties i.e.

$[\oplus] \rightarrow$ the Positive constituent of Quaternion at , A Point

$[\ominus] \rightarrow$ the Negative constituent of Quaternion at , B Point

In Euclidean-Geometry E-vector $\overline{AB}$ carries **Point A to Point B** as , Vector $A \rightarrow B$

In Material-Geometry M-vector $\overline{AB}$ carries **Energy** , $\oplus$, from Point A to $\ominus$, Point B when , $\oplus$ moves to $\ominus$, and which is **The Periodic - Pattern** .

Velocity $\bar{v} =$ The rate of change in AB , Therefore Units are Formatted according to the **Steady-Material-Geometry-Formations** which are :

The **Line-Vector in cave** , r , which is the Simplest with **Double number of 4-Units**

The **Plane-Regular-Triangle in Orbits** , is the most Stable Shape of **6-Plane-Units**

The **Volume-Regular-Tetrahedron in Space** is the most Stable Shape of **8-Volume Units** , **the Cube** , which are Crystals and upper structures .

The Regular n-Hedron are for all others . This is the Why The Glue-Bond , **Potential is the Bond** , between the 6-Units formulates the **Regular-Hexagon** as the First **Steady- Plane - Formulation** in nature as in Fig-19-

4-g.. The Elements needed in Cave for Black-Hole-Genesis .

Both motions , **Periodic and Rotational** , exist as the Mean between the Two Primary- Opposite in PNS $\equiv$ Primary-Neutral-Space . This Mean is the Ocean of the , **Two kinds of Spins** created from the inner motion in Material-points both Oriented by the acceleration **g** , created from Rotational-motion and which **g** , continually effects on Spins through which force **G** , Flows to all Energy structures .

From $r_{\min} = 1,07.10^{-7}$ m and $f_p^2 = \frac{1}{r^3}$ then $f_{\min} = 2,839844.10^{10}$ H , and Bonding Energy
 $L \equiv E = h.f_N = 6.62607.10^{-34} \cdot 2,8398447.10^{10} \text{ J} / 1,6.10^{-19} = 1,176063.10^{-6} \text{ eV}$ or in Joule
 $= 1,8817009.10^{-23} \text{ J} = (\text{Kg.m}^2/\text{s}^2)$. Hydrogen cave was found $a_H = 2,11450164.10^{-11}$ m
 and from Orbit-Quantum-Energy $f_H^2 = \frac{1}{g.r^3} = \frac{1}{9,8076754.(2,1127839.10^{-11})^3} = 10,811069.10^{30}$.

$f_H = 3,288019.10^{15}$ H , while Nutation-Frequency $f_N = \frac{sQ}{2\pi.J_3W} = 2,8398447.10^{10} \text{ s}^{-1} = f_{\min}$

Energy in caves $E = \left\{ \frac{k}{r} + \frac{L^2}{2mr^2} \right\} = \left\{ \frac{\pi g}{r} + \frac{L^2}{2 \left(\frac{g}{4\pi f_e^2} \right) r^2} \right\} = \frac{\pi}{g r^2} [g^2 r + 2L^2 f^2] \dots (1)$ It was proved that

magnitude $\vec{L} = \vec{a} \times \vec{v} = \text{Constant}$ for all central motions . For circular orbits gravitational force G_F equals the centripetal force C_F , so $C_F = G_F$ and $m_p v^2 / R = [G.m_p m_s] / R^2$ and velocity $v^2 = GM/R$. Substituting the expression into the formula for Kinetic - Energy then issues ,

$$K_E = \frac{mv^2}{2} = \frac{m.GM}{2.R} = \frac{GMm}{2.R} , \text{ or } K_E = (1/2) (-P_E) = -\frac{P_E}{2} \text{ and } \rightarrow -P_E = 2.K_E \leftarrow \dots (2)$$

The Total-energy $E = K_E + P_E = K_E - 2.K_E = -K_E$, i.e. **The Potential - Energy P_E is Always -Negative and Twice the Kinetic-Energy While The Total - Energy E , of an Central-Orbiting-System is Negative** . The ratio $L / E \equiv (-P_E / -3K_E) = (2.K_E) / (-3K_E) \equiv -2/3$

Placing (2) in Energy-equation $E = \frac{1}{r^2} \left[\frac{4\pi^2}{c^2} + \frac{S^2}{2m} \right] = \frac{1}{9a^2 mc^2} [36m\pi^2 + 2c^2 E^2]$ then becomes
 $2c^2.E^2 - 9mc^2 r^2.E + 36m\pi^2 = 0$, which is an 2nd degree Equation with solution $\rightarrow$

$$E = \frac{9mc^2 r^2}{4c^2} \pm \frac{1}{4c^2} \left[\sqrt{36mc^2 r^4 - 36.8. mc^2 \pi^2} \right] \dots (3)$$

Since E must always be Negative then , $mc^2 r^4 - 8mc^2 \pi^2 < 0$, or $r^4 - 8\pi^2 < 0$, and from

$$r^4 < 8\pi^2 \rightarrow r^2 < \sqrt{2}.2\pi \text{ then } r < 2,980856 \text{ m} \dots (4)$$

From Unit-energy relation $g f^2 a^3 = 1$, then $f_R = \sqrt{\frac{1}{g.a^3}} = \sqrt{\frac{10^3}{g(2,980856)^3.10^3}} = 6,14453.10^{-2} \text{ H}$ i.e.

a frequency corresponding to Energy $E = h f = 6,62606957.10^{-34} \cdot 6,14453.10^{-2} / 1,602.10^{-19}$

$$= 2,541136.10^{-10} \text{ eV in a cave } a = \sqrt[3]{\frac{1}{g.f^2}} = 2,980856 < 3 \text{ m} .$$

The kicked-Energy is $\rightarrow \vec{B}.f_n = E \equiv \left[\frac{\sigma.\Phi.\vec{B}}{4\pi r} \right] = 1,4603748.10^{-34} \cdot 6,14453.10^{-2} = 8,97332.10^{-36}$

$[\text{Kg.m}^2/\text{s} = \text{Kg.m}^2]$, and from $c = \frac{G\Phi}{A} = \frac{G\Phi}{e^{-i(\frac{\pi}{4}).b}}$, where $A = \sqrt{-i} = e^{-i(\frac{\pi}{4}).b}$, then are

The $\rightarrow$ **Anti-Space + Space-Positions** . From relation , $\sigma = \frac{F}{A} = \frac{G}{A} = \frac{E}{r.A}$, and if $A \rightarrow 0$,
 i.e. **as soon as $\rightarrow A = \{ \text{The Space + Anti-Space Positions in Universe} \}$, become Inadequate**

for Energy-Storage $A = e^{-i(\frac{\pi}{2}).b} = 0,207879576.b = 1,507.10^{-7} \text{ m}$, then **Motion $\equiv$ Energy $\equiv E$**
 is filling **The minimum cave** r , and with the **Necessary-Velocity-Vectors $\rightarrow$ Burst Into another cave** $a > A$ of L_p , **connected to G** , and which **Is an Overflow of the Energy in Space + Anti-Space Positions** [58] . The needed Storages become from $E \equiv \vec{v} . [\vec{f}_n] + f_n$.

The Black Holes :

Black Holes Follow Kepler laws , where , *On any moving Particle when Tangentially colliding or under any angle ϕ , with a Material-Point executing Circular motion* , then the Total Energy is , E , and the Particles follows constant Elliptical Energy - Orbits on the same semi major axis as equation , $1 = c . f_n^2 . a^3$, and of the same constant Energy .

Semi major axis , a , is related to energy as $\rightarrow a = G M m / 2E$, and for ellipse (a b axis)

$$\frac{B^2}{(mab)^2} = -\frac{q.q'}{(ma)^3} \text{ and Spin } |S|^2 \equiv [\vec{B}]^2 = -m q q' \left[\frac{b^2}{a} \right] \text{ or } \vec{B} \equiv \sqrt{maqq'} \left[\frac{b}{a} \right] = \vec{B} \equiv \sqrt{maqq'} \text{ for } a = b$$

i.e. for very large Energies , semi major axis tends to a **Negative-Energy-Point** , which is the beginning of the Black hole such as in microcosm and macrocosm . **For axis** $a \rightarrow \pm 0$, **then frequency** $f_n \rightarrow \infty$, or energy is Infinite , and $E \rightarrow \infty$, which is a Black-hole . [61]

In **Black-holes** where exists the Rotation-Energy , *the Spin* , velocities follow Quantization of Unit-velocity as $v = 2\pi.f_1[n c/2f_1] = n.\pi.c$. From prior relations in B-Holes-Energy is found the SPIN , $S \equiv B$, by using equation of kicked-Energy which is $\rightarrow \vec{B}.f_n = E \equiv \left[\frac{\sigma.\Phi.\vec{B}}{4\pi r_n} \right] \leftarrow$ for r_n in cave .

Angular-Momentum $\vec{B} = \frac{2L}{\vec{w}} = \frac{2L}{2\pi f} = \frac{\pi^2 r^4 . f}{2}$, and vector $\vec{B} = a m v$, becomes $\vec{B} = a m v =$

$$2,1127839.10^{-11} \text{ m} . 7,237315.10^{-32} \text{ kg} . 2,99798.10^8 = 4,5841758.10^{-34} / \pi , \text{ and Spin}$$

$S/2 = 1,4603748.10^{-34}$ which is the E-Spin . From cave-relation , a cave , as $d = a = \sqrt[3]{\frac{1}{g.f^2}} =$

$$\sqrt[3]{\frac{1}{9,808.f_3 M^2}} = \sqrt[3]{4,851734.10^{-30}} = a = 1,69290399.10^{-10} \text{ m , then it is Bracket-length}$$

$\Delta = 2a = 3,3858078.10^{-10} \text{ m}$.The Black-Hole-Gravity-equation related to the Inner-Quantum-velocity $v = c$, and to its n , **lobes** is the frequency squared as ,

$$f^2 = \frac{k}{m.a^3} = \frac{\pi g}{a^3 \cdot [\frac{g}{4\pi f^2}]} = \frac{4\pi^2 f^2 g}{ga^3} = \frac{w^2}{a^3} = \frac{v^3}{a^4} , \text{ and } \rightarrow f_n = \frac{c}{a^2} = \frac{n.\pi.c}{a^2} \leftarrow \text{Energy Increases .}$$

$$\text{Constant-Force } G \equiv \sigma . \Phi^3 \equiv \Phi^2 . [\{\sigma \Phi\} \equiv [\frac{2B}{\pi r^3}]] \equiv 2\pi f_p r \equiv w r \equiv \bar{v} \equiv m a \equiv m g = \bar{c} = \frac{2.B}{\pi r^3}]$$

$$\text{Energy of Photons} = \text{motion} / T \equiv (\frac{v}{2\pi r}) . [\sigma + \sigma \Phi] = \text{velocity} \rightarrow \bar{v} . [\frac{\sigma}{2\pi r} + \frac{\sigma \Phi}{2\pi r}] \equiv \bar{v} . [\frac{\bar{f}_n}{\bar{f}_n} + f_n]$$

For **Black-Holes** , the Total-Energy $L = \bar{B} \bar{w} = \frac{J.w}{2} w = \frac{\pi r^4}{2} [2\pi f]^2 = 2\pi^3 r^4 f^2 = r m v = r m . w r$

and mass $m = \frac{2\pi^3 r^4 f^2}{r^2 2\pi f} = \frac{\pi^2 r^2}{1} f = [\frac{\pi r}{2}] v$,while **Angular-Momentum** $B = r.m.v = r [\frac{\pi r v}{2}] v = \frac{\pi r^2}{2} v^2$

$$= \frac{\pi r^2}{2} v^2 = \frac{\pi r^2}{2} [n.\pi.c]^2 = \frac{\pi^3 r^2}{2} c^2 , \text{ or Black-Hole-Energy } \rightarrow B_E = 2.\pi^3.r^4.f^2 = 2r(\pi r)^3.f^2 \leftarrow$$

i.e. **Velocity in Black-Holes is Related to Cave , r^3 , and Energy f^2 times of light velocity.**

The Produced Work relation , $W = 2L = \bar{B} . \bar{w} = J.w^2$, and being as Centripetal-Force

$$F_G \equiv [\frac{v^2}{r}] Jw^2 = \frac{v^2}{r} [\frac{\pi r^4}{2}] \frac{v^2}{r^2} = \frac{\pi r v^4}{2} , \text{ which Generally represent ,}$$

The Black-Hole-Gravity-equation Related to the Inner Quantum-velocity $\bar{v}$ to its , n , lobes.

For gravity $g \cong \sigma = \frac{\text{Force}}{\text{Area}} = \frac{\text{Mass}}{\text{Area}} = \text{Gravity-Acceleration and Impedance} , s , \text{ then}$

$$g_G = s [\frac{\pi r v^4}{2}] = [\frac{3,1415926([\sqrt{5}+1].\sqrt[4]{2}.10^{-35}).(299793458)^4}{2}] . e^3 =$$

$$6,044981.10^{-35}.80,776078.10^{32}.20,085536 = \mathbf{9,8076925} , \text{ and is a constant .}$$

Moreover , from the Primary equation of Electron $\rightarrow w_e^2 . m_e = \pi g = \text{constant} \equiv \text{Energy}$

$\equiv [\text{the meter of area} * \text{meter of force}] \equiv \text{Electrons on Orbits}$, on *Traces* and also from the

Unit-Space $\equiv$ Massive -United-Unit-Space $\equiv \rightarrow [+ \bar{v}.s^2] \leftarrow$ The Nucleus is jointed through

the Neutral Material-Points [(+) [$\leftrightarrow$] (-)] with the , **Strong - force** $\rightarrow$ which is

$$S_F = h . f_n \equiv h . \{[S \equiv B_p \equiv \mathbf{EM-R} \equiv f_{1=N} , f_2 , f_3 , f_D , f_n = w^2]\} \equiv h.n \frac{(1+\sqrt{5})\sigma}{4\pi r} \equiv h \frac{2.\bar{B}}{\pi^2.r^3} , \text{ and is an}$$

increasing-Energy(mg) . From relation Force $G = \sigma A = [2\pi f r] \frac{A}{\Phi} = w r = \bar{c} . [\frac{A}{\Phi}]$ then ,

Action of $G \rightarrow$ on $\bar{c}$ follows relation $\sigma x \Phi^3 \equiv G$, and from Energy-force F_g in cave , $r = L_p$, Planck`s scale

then mass $m_g = J.w^2$, **where** angular-velocity $w = \frac{c}{r}$, and from the 3-Dimensional $[2^3 = (\oplus \leftrightarrow \ominus)^3]$ the

Impedance is g_Z , and of Space $\ln(3)$ and Anti-Space $\pi\sqrt{3}$, then the Centrifugal-Force F_g becomes,

$$F_g = m_g [\frac{c^2}{r}] = J w^2 . \frac{c^2}{r} . g_Z = [\frac{\pi r^4}{2}] . [\frac{c}{r}]^2 . [\frac{c^2}{r}] . \{ 2^3 . \ln(3) . \pi\sqrt{3} \} = \mathbf{4 \sqrt{3} \ln 3 . \pi^2 r c^4} ,$$

$$\text{and } F_g = \bar{g} = 4. \sqrt{3}.1,0986122886681.\pi^2.1,616199.10^{-35}.[2,99793458.10^2]^4 = \mathbf{9,8076754}$$

which agrees with the Prior .

5-g... Applications :

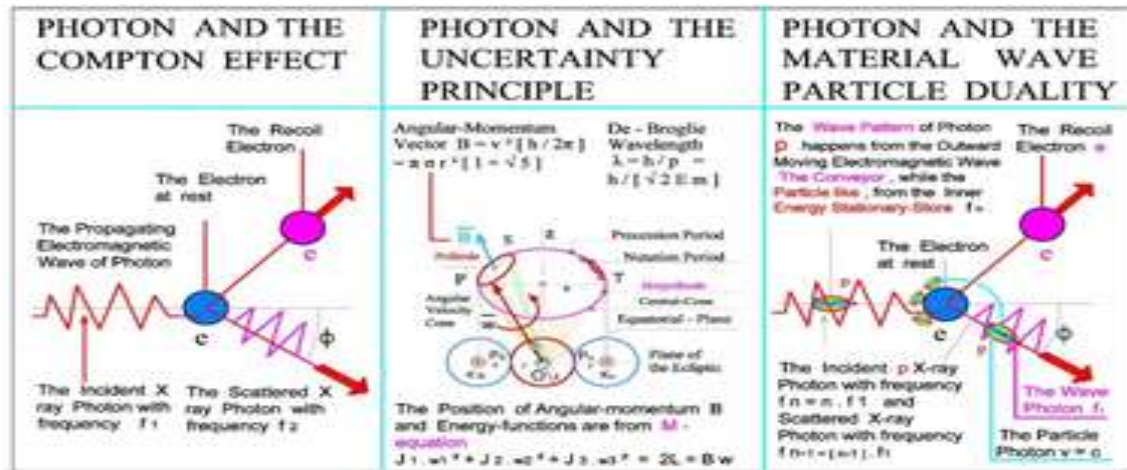


Figure – 20- : The Wave-Particle Duality of Photon as Wave and as Particle :

The equation of Photon is $\rightarrow \{ \bar{c} \cdot \bar{f}_n + \bar{c} \cdot f_n \} \leftarrow$ i.e. is of Dual Frequencies ,

The Wave $[f_1 = (E^2 + H^2) = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{2\bar{B}}{\pi^2 r^4}]$ - Particle $[\bar{v} = \bar{c} = \lambda \frac{f}{\phi}] \rightarrow$ Duality

In Revolving or Rotational motion , which is the opposite of prior , in the Moving Photon being a Material-Point , the Box B_p with fix-ends and the Inward-cave , r , which is the Energy-Storage B_p , is the Outward cave , r , as an Electromagnetic – Radiation of wavelength $\lambda = c T = c / f_p$, which carries , Pushes , the Storage B_p .

In Fig-20- Compton-effect is shown the Why Golden-ratio-frequency $f_p = \frac{\sigma \cdot r}{\pi \cdot B} = \frac{n \sigma \cdot \Phi}{2\pi r}$ exists in nature from the micro to the macro scale and is a Pressure everywhere in all the Energy structures . Energy is the motion defined In-Box , the minimum Resonance-Golden-ratio frequency $f_R = f_1$ which follows the Kepler constant for microcosm and frequency f_R defines in Outer-Box the Electromagnetic Radiation which is the Conveyer , the carrier of the Energy-Cave , r . The Reality is found that the Energy-Space United-universe of one Force which produces the Work $\equiv$ Force $\times$ Space , and which is conserved as a motion in all Space-Boxes . Potential-Energy $\equiv P_E$ stored in Material-Point is the Electric-Field $E = g \pi$, in where $[\oplus]$ moves to $[\ominus]$ and thus from Geometry-Shape are created the two opposite Angular-momentum vectors and from Dipole , the Spin $S = \frac{1}{2} S$, in r cave filling the whole universe .

In Periodic-Orbital-motion issues Tack-Geometry i.e. the tracks of the Electric lines are Pattern of closed loops-Pairs , starting Clock-wise and Anti-clockwise from the $\oplus$ Spring not as straight-lines because of the Voltage between ends of Spaces , and the created motion as an Eternal rotation of the $[\oplus]$ constituent towards $[\ominus]$ constituent . In both cases Angular momentum $\bar{B}$, is equal to $\pm$ Spin S . The Material Points , Segments etc. consist the Physical Structures . In the finite-Space of Material-Point , in cave r , is stored the Work as frequencies , and Because Stress $\sigma > 0$, due to Spin $\equiv$ Angular momentum $\bar{B}$, is equal to AM/Unit Area $= AM / \pi$, and frequency $f_n = \frac{\bar{B}}{\pi^2 r^4}$ so the Spin is either Positive or Negative and equal to the Electric Charge $\bar{E} = \pm AM / \pi$. The Spin becomes from the $\uparrow \leftrightarrow \downarrow$ Antiparallel Angular - Momentum-vectors $\bar{B}$.

which is equal to the Golden-ratio , becoming from Spin of cave r , the Spinning-Stationary M-point with Fundamental frequency f_1 that of equation $\rightarrow W = \left[\frac{4\pi r^3}{3} \right] \cdot f_1 = \frac{(1+\sqrt{5}) \cdot \sigma \cdot r^2}{3} = 2L = \bar{B} \cdot \bar{w} = J \cdot w^2$.

This Stationary-Energy-Storage is as the , Coulomb Electrical-Force where the Electrical-Force as $F_{\text{electron}} = k_c \frac{Q_1 Q_2}{d^2} = \frac{[\oplus \leftrightarrow \ominus]}{d^2} = k_c \frac{2\sigma}{|e|^2} = k_c \left[\frac{4\pi f_1}{r\Phi} \right] = k_c \frac{\sigma}{2r^2} = k_c \frac{2c}{r^2 \Phi}$ is in Box B_e , and for Photon

$F_{\text{photon}} = \frac{[\oplus \leftrightarrow \ominus]}{r^2} = \frac{[\sigma \cdot \sigma]}{r^2} = \left| \frac{\sigma}{r} \right|^2 = \left| \frac{2\pi f_1}{\Phi} \right|^2 = \left| \frac{w}{\Phi} \right|^2 = \left| \frac{2L}{\Phi \bar{B}} \right|^2 = \left| \frac{\bar{c}}{r \cdot \Phi} \right|^2$, is in the same Box B_e , since

Angular-momentum $\equiv$ Spin $\equiv \bar{B} = \frac{\pi r^3 \sigma}{4} [1+\sqrt{5}] = \left| \frac{\pi r^3 \Phi \sigma}{2} \right| = \left[\frac{\pi r^3 \bar{c}}{2} \right]$, as for Orbit-Forces .

Above relation agrees with Laplace-equations for Incompressibility and Irrotationality where $\nabla \times \bar{q} = \bar{r}_x + \bar{v}_y = 0$, and $\nabla \times \bar{v} = \bar{v}_x - \bar{r}_y = 0$, meaning that Space , $\bar{r}$, and Energy , $\bar{v}$ = motion are Interchanged $\rightarrow$ Because from the first relation issues that the Magnetic-field-Space $\bar{r}_x$ creates The Electric-field-Energy , $\bar{v}_y$, and from the second $\rightarrow$ Energy $\bar{v}_x$ Pushes the Space $\bar{r}_x$.

The Electron-Orbit-equation $\rightarrow 4\pi^2 f_e^2 \cdot m_e = k = \pi g$ or $4\pi f_e^2 \cdot m_e = g$, $k = \pi g$, denotes that $\oplus$ **Space** $\equiv$ Electric-field in-where exist Electric-lines, i.e. the tracks of Electron motion of the $\ominus$ **Anti-space**.

The Right Momentum vector $AM \equiv \uparrow$ is the Produced Work and **stored in Magnetic-field** as motion while left-vector $AM \equiv \downarrow$ is the Produced Work and stored in the opposite **Magnetic field** as motion and both consist the Dipole $[\oplus \leftrightarrow \ominus]$, **Tack-Geometry**. The **Chains of Stationary-Periodic-Spins** are Pointy-vibrating in Orbit as LRC- Circuit with its frequencies $\{f_1 = \frac{(1+\sqrt{5}) \cdot \sigma}{4\pi r}\} \times \bar{B} = [\sigma \Phi \pi r^3] f = \frac{\bar{B}^2}{\pi^2 r^4} = |\frac{\pi r^3 \sigma \Phi}{2}| \bar{B}$, filling up the entire universe. **Stationary-Electron-Charge** $q \equiv \ominus$, with **Orbit-Velocity-Vector** $\bar{v} = \sqrt{\frac{2}{m} [E - \{\frac{k}{r} + \frac{L^2}{2m r^2}\}]}$ occupies Zero Kinetic-energy between Q_1, Q_2 therefore, $K_E = \frac{mv^2}{2} = E - \{\frac{k}{r} + \frac{L^2}{2m r^2}\} = 0$ or $E = \{\frac{k}{r} + \frac{L^2}{2m r^2}\} = \frac{2\pi g}{r} + \frac{S^2}{2(g/4\pi^2) r^2} = \frac{2\pi}{g r^2} [g^2 r + S^2 f^2]$ (s). Equation (s) issues for the Spinning Points and Atoms-Stationary-nucleus and is **The Strong-Force** between **Nucleus-Protons**.

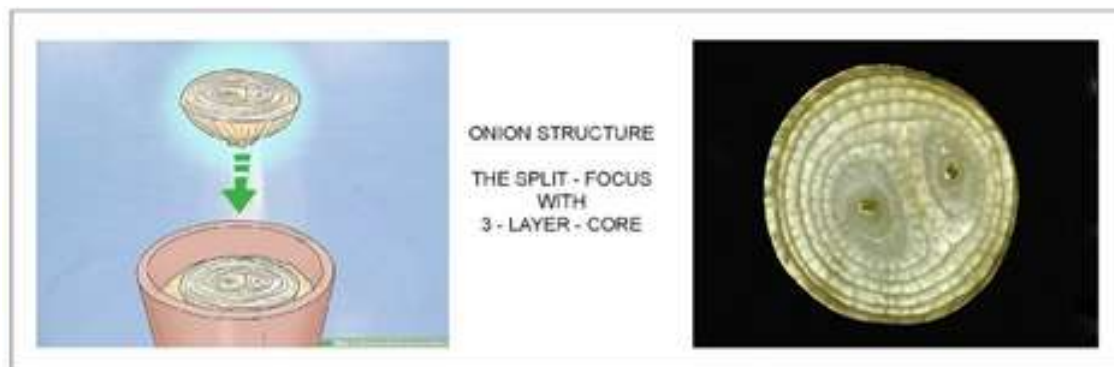


Figure – 21. The Newton's Universal Laws in Atoms and in Onion - Structures.

The Slit-Focus-Atom structure with the three Hydrogen – Orbitals.

The Neutral Material-Points $[(+) [\leftrightarrow] (-)]$ with the **Strong –Nuclear - Force**

$$S_F = h f_n \equiv h \cdot \{[S \equiv B_P \equiv \mathbf{EM-R} = f_{1=N}, f_2, f_3, f_D, f_n]\} \equiv h \cdot n \frac{(1+\sqrt{5})\sigma}{4\pi r} \equiv h \frac{n\sigma \cdot \bar{B}}{8 r^2}$$

are so because $f_n = |\frac{\sigma^2 \Phi^2}{2\pi \cdot c}| \cdot \bar{B}$, and it is the DNA of all Energy-Structures.

In Fig-21-, The Vector-Space-Cave $m = 1$, with Two-Nucleus-masses of One-Charge and with $2m^2 = 2$ Permitted-Orbit-Positions, per 2 Electrons for Stability, consists the first, **3**, Perpendicular-Plane-Permitted Positions in Cave, for the $\rightarrow$ **Lissajous – Eight - Shapes**. The Linear-Vibrations $[\ddot{x} + \omega^2 x = 0]$ of the 3-masses, Occur on the Two Perpendicular each other, Line-Vectors of $x \perp y$ Plane, as above Shapes which for

- Difference of Phase $d_\phi = 90^\circ$ emission is $\rightarrow$ The Eight-Shapes ∞ on Nucleus.
- Difference of Phase $d_\phi = 0^\circ$ emission is $\rightarrow$ The Ellipse-Shapes $\propto$, after 1st curve.
- Difference of Phase $d_\phi = 45^\circ$ emission is $\rightarrow$ The Double-Saddle-Shapes $\mathfrak{S}, \mathfrak{G}$, on the two, One Proton and One Neutron-Nucleus. The Circular-motion happens after the Lissajous-Shapes on Elements $2m^2 = 2.4 = 8$ region which is the Helium cave.

The Light velocity vector $\bar{v} = \bar{c}$ is acting on **an-cave**, $r \neq L_P$, faces-to the Impedance Z_c from Velocity $\bar{c}$, and Becomes the minimum-Energy-cave in L_P , and Equals to $E \equiv r Z_c \bar{c}$, and cave

$$r_H = \frac{h}{c Z_c} = \frac{[6,62606957 \cdot 10^{-34}]}{2,99798 \cdot 10^8 \cdot 1,0460975 \cdot 10^{-31}} = 2,1127839 \cdot 10^{-11} \text{ m, Is the Hydrogen cave.}$$

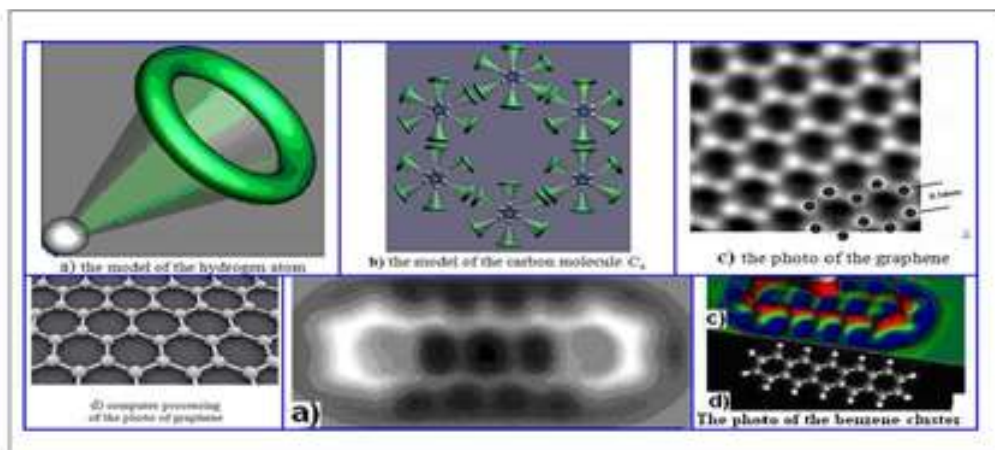


Figure – 22 - : Photo from → RESOLUTION OF THE RUSSIAN THEORY OF MICROWORLD :
By Professor Ph. M. Kanarev [kanarevm@mail.ru]

- In-a- Is shown the structure of Graphene (Regular Hexagon of E-geometry) in a higher Level .
 In-b-d Is shown the Regular Hexagon structure with Nucleus ,Core, to be the Torsional missing link of Cluster , and this because Core is a Cave .
 In-c- Is shown the Hexagon structure becoming from the Triangle ,times, two Units each point and is equal to Six units , or (3 vertex x 2 units = 6 Units) , for any compound Cluster .
 In-c-d Hexagon shape is because in Photos is included the Projective Plane of Graphene only . The Plane Directions , for the Steady - Triangle Shapes , of $3 \times 2 = 6 (\pm)$ elements ,is the Regular-Hexagon-Plane-Bonding .The Hydrogen-Light-Photon-cave $2,114501610^{-11}$ m as well the Inverse Electromagnetic-Radiation Show the above , Photos in 3-D . The Plane Bonding of Atoms follows The Stability of Material-Geometry [86] .

6-g... The Greatest Energy-Pressure-Level



Figure – 23 - : The [+] Spaces , [-] Anti-Spaces , [+ -] Sub-Spaces in a circle (R , OA)

The Material-Geometry explanation of the Pascal's-Triangle .

Stress $\sigma = \frac{\text{Force}}{\text{Area}}$, and is the Pressure executed by the Force on an Surface A . Sound Pressure , SP, is the Pressure measured within the wave relative to the surrounding air Pressure . The SP , like other kinds of Pressure , is commonly measured in units of Pascal's (Pa) = $\frac{\text{N}}{\text{m}^2} = \frac{\text{Kg}}{\text{ms}^2} = \frac{\text{J}}{\text{m}^3}$, with minimum SP , equal to , **Quantum** $p_0 = 2.10^{-5}$ Pa ≈ 0 (dB) the Decibel .

The equation of Sound-Pressure-Level , SPL, is $L_{SP} = 20 \cdot \log_{10}(\frac{P}{P_0})$ dB , where P =Pressure , $L_{SP0} = 0$ dB corresponds at Unit frequency $f_s = 1$ kHz . The Sound-Intensity-Level , SIL is , $L_{SI} = 10 \cdot \log_{10}(\frac{I}{I_0})$ dB , where Intensity $I = \frac{p^2}{Z_0}$, and Impedance of the Quantum p_0 is $Z_0 = 400 \text{ Ns/m}^3$

The greatest SP , cannot be exceeded the average air Pressure which is , 101325 Pa , and fixed

$$\text{SPL , is } L_{SP} = 20 \cdot \log_{10}(\frac{101325}{0.00002}) = 194 \text{ dB} \quad \dots\dots(s1)$$

In Material Geometry Photon-frequency $f_{ph} = \left[\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r} \right]$ which is related to the Stress ,
 σ = Force/Area , and is the **Energy-Pressure-Level** , **EPL** , of the ,**Wave + Particle Photon** , for
 its dual-frequency . The Greatest , EPL , for the two Opposite-Elements $\{\oplus, \ominus\}$ in Space is their
 Permutation $P_{1S}^2 = 2$, and for Anti-Space $P_{1AS}^2 = 2$ or for both $P_{1,S+A}^2 = 2 \cdot 2 = 4$, as min-Levels .
Because in [9] , The Circumscribed-Regular-Polygons in a circle (O,OA) Denote the Spaces and
 Anti-Spaces $[(\oplus \leftrightarrow \ominus)]$, and the Inscribed-Regular-Polygons of the circle Denote the Sub-Spaces
and Because in [63] ,The Regular-Polygons Denote the Structure of Material-Geometry to be as ,
 A Point $\rightarrow n=1$, $m=2$, $\{S \equiv \oplus \leftrightarrow \ominus \equiv A\} \rightarrow S = \text{Space} , A = \text{Anti-Space}$ and for ,
 Line-sector $\rightarrow n=2$, $m=4$, $\begin{pmatrix} S & \leftrightarrow & S \\ S & \leftrightarrow & A \\ A & \leftrightarrow & A \end{pmatrix} \rightarrow S = \text{Space} , A = \text{Anti-Space}$ and for ,
 Plane-Triangle $\rightarrow n=3$, $m=6$, $\begin{pmatrix} S & A & S \\ s & s & s \\ A & S & A \end{pmatrix} \rightarrow S = \text{Space} , A = \text{Anti-Space} , s = \text{Sub-Space}$, for ,
 A Volume $\rightarrow n=4$, $m=8$, $\begin{pmatrix} S & A & S \\ s & S & s \\ A & S & A \end{pmatrix} \rightarrow S = \text{Space} , A = \text{Anti-Space} , s = \text{Sub-Space}$
and Because **Regular-Hexagon** is of $3 \times 2 = 6$ Vertices on **Plane-Triangle** +
Regular--Octagon is of $4 \times 2 = 8$ Vertices on **Volume-Tetrahedron** then ,
Regular-Heptagon-Anti Heptagon is of , $7 \times 2 = 14$ Vertices [63-P70] .

The Regular-Heptagon is Between the Two-Regions , **Plane –Volume** , therefore Needs more **Pressure** , and
 consists the Upper - Largest Energy-Level with Permutation , the number of **Permutation** with Repetition of the
Seventh - Element as , $RP_2^n \equiv n^2 \rightarrow P_2^7 = 7^2 = 49$, and

$$\text{The Greatest EPL is } \rightarrow P_{1,S+A}^2 \times P_2^7 = 4 \times 49 = 196 = L_{EP} = \mathbf{196 \text{ dB}} \dots\dots(s2)$$

Remarks :

- 1... The Stress σ is executed on all Surfaces , either in Planes or on Surfaces of Volumes , and
 consists the exclusive-meter of measurements , in dB , in all nature .
- 2... Stress σ , occupies minimum and maximum limits , $0 \approx 196 \text{ dB}$, differing 2 Units which
 can be changed by altering the Base of Pressure from , 101325 to $\rightarrow 102389 \text{ Pa}$.
- 3... Minimum and Maximum limits , $0 \approx 194 \approx 196 \text{ dB}$, become from $L_{EP} = \left[\frac{\pi^2}{N_c} \right]^3 = 194 \text{ dB}$
- 4... Stress , σ , occupies Minimum and Maximum because is related to frequency and velocity
 $f_{ph} = \left[\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r} \right] \equiv \frac{\sigma + \sigma\Phi}{2\pi r} = \frac{\sigma[1+\Phi]}{2\pi r} = \frac{\sigma[\Phi]^2}{2\pi r}$, or $\sigma \equiv \frac{f_{ph} \cdot 2\pi \cdot r}{\Phi^2} \equiv \frac{w \cdot r}{\Phi^2} \equiv \frac{v}{\Phi^2} \equiv \bar{c} \cdot \frac{1}{\Phi^2}$
 and is **The-Stress-Way** of Photon-Storages $\left[\bar{f}_n \right] \equiv \frac{\sigma}{2\pi r}$, and Photon-Information $f_n \equiv \frac{\sigma\Phi}{2\pi r}$
 From force $G \equiv \sigma \cdot \Phi^3 \equiv \Phi^2 \cdot [\{\sigma\Phi\}] \equiv \left[\frac{2B}{\pi r^3} \right] \equiv 2\pi f_p r \equiv w r \equiv \bar{v} \equiv m a = m g = \bar{c}$] then
 Stress $\{\sigma\Phi\} \equiv \left[\frac{2B}{\pi r^3} \right] \equiv 2\pi \cdot f_p r \equiv w r \equiv \bar{v} \equiv m a = m g = \bar{c}$] is dependent on Total-Prior.

As soon as $A = \sigma\Phi \equiv \{\text{The Space +Anti-Space Positions in Universe}\}$, become **Inadequate** for
 an **min-Energy-Storage** $A = e^{-i \cdot \left(\frac{\pi}{2}\right) \cdot b} = 0$, $207879576 \cdot b = 1,507 \cdot 10^{-7} \text{ m}$, then **Motion** $\equiv$ **Energy**
 is first filling **The minimum cave** , r , and with the Necessary **Velocity-Vectors** $\rightarrow$ **Burst**
Into another cave $a > A = 1,507 \cdot 10^{-7} \text{ m}$, in L_p , and **connected to** , G , and which is
An Overflow of the Energy in the , **Space +Anti-Space Positions** [58] .

In Photon relation $E_{ph} \equiv \bar{c} \cdot \left\{ \left[\bar{f}_n \right] + f_n \right\}$ is seen the Storages $\left[\bar{f}_n \right]$, and from $c f = \bar{q}_{ph} \equiv \frac{\bar{c} \cdot \sigma\Phi}{2\pi r} \equiv \frac{\bar{w} \cdot \sigma\Phi}{2\pi r}$, The
 Stresses . **Overflow of Photon Energy** happens **In Anti-Quadrature** where , **The Pushing of E-Squares**
 $\{\text{Each-Individual-Square} \equiv \text{EM-Wave}\}$, **Into Its-Inscribed-Circle** , is **Its - Unit-Energy- Quantum** .11- j .

H ... THE ELEMENTARY PARTICLES :

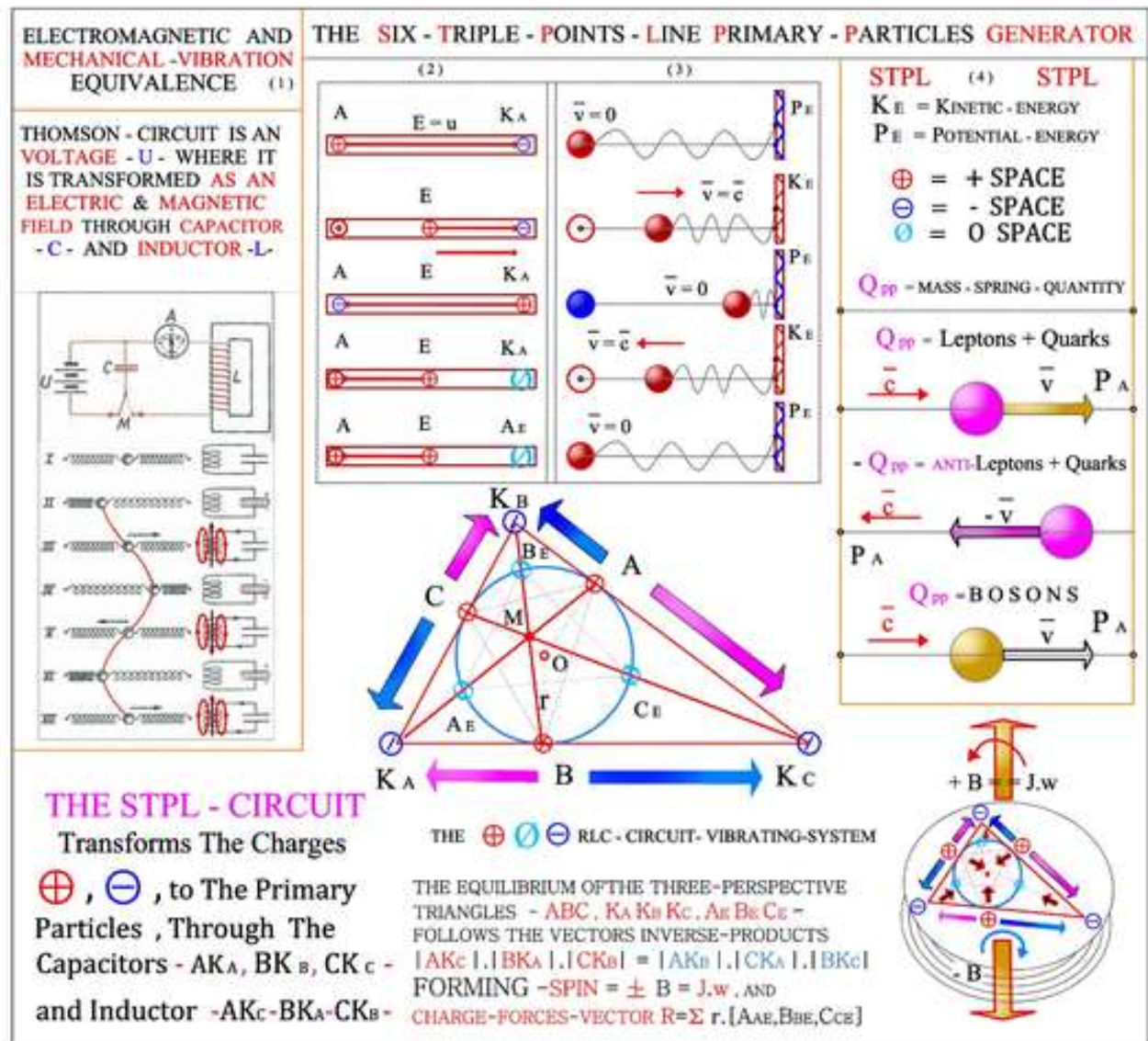


Figure – 24. The Analogous of an { RLC circuit of Charges $\oplus, \ominus$ } to an Oscillating Mass-System on $r = u$, Displacement with No - Friction, No -Stiffness and No - Driving-Force. The CTPL - Circuit is an Automobile-System, since The Three-Charges, +, -, 0, exist on The Three-Spaces as in fig-28, 32.

All bodies possessing mass and Elasticity are capable of vibration, and for Thomson-Circuit the System is forced to vibrate at the excitation **Resonant-frequency** from an Voltage U as charging-current, i , and oscillation as, $\omega = 2\pi f$, will take place at its Natural frequency, f_n , which is a Property of the System.

The **Capacitors** - Store Electrical-energy as Charging-current in *an Electric-field*, while

The **Inductors** - Store Electrical-energy as Charging-current in *an Magnetic-field*.

Thomson-circuit is a **System** consisted of an Voltage U , an Capacitor C , and an Inductor L .

STPL - circuit, is a **System** consisted of an Voltage, $U \equiv [\oplus \rightarrow \ominus]$, an Capacitor, $C \equiv [\oplus \cup \ominus]$, and the Three Inductors, $L_1 \equiv AK_A - A_E K_A$, $L_2 \equiv BK_B - B_E K_B$, $L_3 \equiv CK_C - C_E K_C$, on Common-circle $[O, OA]$, as a **Three-Phase-Rotor**, becoming from the Three M-P-Elements, $\oplus, \ominus, \emptyset \equiv [\oplus \leftrightarrow \ominus] \equiv \{+, 0, -\}$.

In Thomson circuit, the **Energy** = motion as **Voltage** U , or *Potential difference*, or *Electromotive force* EMF, is **Transformed** as an charging current $i = C \frac{dU}{dt}$, into the Capacitor C and the **electric-Charges**, $\oplus, \ominus$, are stored into an **Produced -Electric -field** E_F , which, E_F is generated between the two Plates from the Dielectric of the Opposite-Polarity Charges, $\oplus, \ominus$, on the Capacitors Plates. The Three circular Circuits on Spaces-System are $AB_E A_E C_E, BC_E B_E A_E, CA_E C_E B_E$, on which issues **Ptolemy's** theorem $|AC_E| |A_E B_E| + |AB_E| |A_E C_E| = |AA_E| |C_E B_E|$, $|BA_E| |B_E C_E| + |BC_E| |B_E A_E| = |BB_E| |A_E C_E|$, $|CB_E| |C_E A_E| + |CA_E| |C_E B_E| = |CC_E| |B_E A_E|$, **for Static-Equilibrium**, and for the **Torque-Balance of $\pm$ Spins**, as **Ceba's** Theorem. $\rightarrow |AK_C| \cdot |BK_A| \cdot |CK_B| = AK_B \cdot |CK_A| \cdot |BK_C| \leftarrow$
Once M-Switch is On to **Inductor C**, then current i , flows into Inductor L , since its Electromotive force U , is

the minimum and that of Capacitors the maximum . The **electric-Charges** , $\oplus$, $\ominus$, are stored into Inductor **L** , by **Producing an Magnetic-field** , M_F , and this because of the Inductor's Shape and opposite to Capacitor's .

Meanwhile its Electromotive force , EMF , increases Up to U , and the Capacitor's , EMF , is constantly changing across its Plates and decreases to the minimum **and** , Capacitor's **Electric-field** E_F , is transformed to initial **Magnetic-field** M_F , *due to the opposite Polarity(= direction) charges* , while the Inductor's **Magnetic-field** M_F , is transformed to initial **Electric-field** E_F , **and This Procedure is continuously repeated** .

In System-circuit , motion occurs from the Spring-Voltage U , either to Capacitor C , or to Inductor L , therefore Electric-Charges , $\oplus$, $\ominus$, are moving from $\rightarrow$ **Capacitor to** $\rightarrow$ **Inductive** , and vice-versa $\leftarrow$ **i.e.**

Charges Oscillate between $C \leftrightarrow L$, or $u = |C \leftrightarrow L|$, following equation $m \cdot \ddot{u} + w^2 u = 0$, with solution $w^2 = [k/m]$, Period $T = 2\pi \cdot \sqrt{\frac{m}{k}}$, Frequency $f_H = \frac{1}{2\pi} \sqrt{\frac{k}{m}}$, Energy $E = h \cdot f_H$, where m = System-mass k = The constant of Integration ,or Unit-energy-Stiffness for Orbit-motion $k = \frac{1}{f^2 \cdot u^3}$, h = Planck's constant

In **STPL-circuit** , the **Energy** = motion ,becomes from the Force-Charges, $\oplus$, $\ominus$,which affect on $\bar{F}_S$ -**Segments** $u_S = AK_A$, BK_B , CK_C , as the **Electric-Current** , $\ominus$, and on $\bar{F}_T$ -**Tangents** , $u_T = K_A K_B$, $K_B K_C$, $K_C K_A$, as **Magnetic-Moment** , $\bar{\mu}$, of Material – Point = $[\frac{h}{2\pi}] \equiv \text{SPIN}$, on Sub-Space-circle of radius , $r = OA = OB = OC$ where , **Electric-Current** , $\ominus$, is the Space-Part and **Magnetic-Moment** , $\bar{\mu} = \text{SPIN}$, is the Anti-Space-Part , as

1...The **Charge-Segment- Forces** $\bar{F}_S$ as $\rightarrow Q_{AK_A}$ and $Q_{A_E K_A}$, **Push** Particles Out the Sub-Space circle and form Elementary-Particles at P_A and D_A Points of STPL -circuit .

2...The **Charge-Tangential- Forces** $\bar{F}_T$ as $\rightarrow Q_{K_A, K_B}$ and $Q_{K_A, K_C} = Q_{\pm} = [\frac{eS}{r^2}] \leftarrow$ **Rotates Particles** giving them Spin $\pm \bar{B} = \frac{\pi r^3 \Phi \cdot \sigma}{4} \equiv \frac{2L}{2\pi f} = \frac{\pi^2 r^4 \cdot f}{2}$, and from $\bar{B}$, the **Natural frequency** $\rightarrow w_{Nf} = 2\pi \cdot f = 2\pi [\frac{B}{\pi^2 r^4}]$.

1-h.. The Size of Cosmic Particles .

1.. The **Three Elements** $\equiv$ Digits of Material-Geometry are , $\{\oplus, [\oplus \leftrightarrow \ominus], \ominus\} \equiv [+ , 0 , -]$

The **Permutation** , *arrangement* , of the Two-Elements $P_1^2 = 2$, i.e. the $\rightarrow [\oplus, \ominus] - [\ominus, \oplus]$

The **Three-Elements in Space** need $P_1^3 = 3 \cdot (3-1) \cdot (3-2) = 6$ Positions and the same for the **Three-Elements in Anti-Space** need $P_1^3 = 3 \cdot (3-1) \cdot (3-2) = 6$ Positions , and the needed Total

Places are $P_1^3 \cdot P_1^3 = 6 \times 6 = 36$ Positions for **Spaces and Anti-Spaces** as **Impedance** , and as before the maximum Growth for , $\log_x x$ and Base $x = 10$ is $\log_{10} 10 = 10^{10}$, and for the two elements $[\oplus, \ominus]$, the Growth is $10^{[10]^2} = 10^{20}$ **Positions** $\equiv$ Distances $\equiv r$, and since also issues

$10^{-x} = \frac{1}{10^x}$, then **Impedance** , **b** , for **Two Elements in Space Anti-Space** is , $b = 36 \cdot 10^{-20} \text{ m}$.

and for the velocity $\rightarrow \bar{v} = \bar{c} = \frac{F \Phi}{A \cdot b} = [\frac{G \Phi}{A}] = [\frac{6,673692 \cdot 10^{-11} \cdot 1,6180339887}{36 \cdot 10^{-20}}] = 2,9995163 \cdot 10^8 \text{ m/s}$,

and 200-times the Impedance is $= 200 \cdot b = 3,6 \cdot 10^{-19} = 7,2 \cdot 10^{-21} \equiv$ Neutrino-cave $a_v = 7,2 \cdot 10^{-21} \text{ m}$.

2.. The Light velocity vector $\bar{v} = \bar{c}$ is acting on cave , $r = L_P$, and finding Impedance the mass m_g , becomes the Centrifugal-Force , F_g , of the Cave and is Equal to Gravity , g , while the **Light velocity vector** $\bar{v} = \bar{c}$ acting on **an-cave** , $r \neq L_P$, as that is the **STPL - Common circle** then finds the-Impedance Z_c of the Velocity $\bar{c}$, and becomes the minimum-Energy-cave in $2r$, and is equal to $E \equiv r Z_c \bar{c} \dots (1)$ where , E = The Planck's-Total-Energy $E_p = h = 6,62606957 \cdot 10^{-34} \text{ J.s}$, r = The min-Energy cave of Common-circle Z_c = The Total Impedance in Universe $\equiv$ Space + Anti-Space from velocity motion $\bar{c}$ = The light-velocity in m/s . Equation (1) becomes , $r Z_c c = h \dots (1a)$. From - **3f**

The **Three Elements** $\equiv$ **Digits** of Material-Geometry which are $\{\oplus, [\oplus \leftrightarrow \ominus], \ominus\} \equiv [+ , 0 , -]$, and as before for $\log_x x$ and Base $x = 10$ then $\log_{10} 10 = 10^{10}$ is the Growth , **Impedance is the Anti-Growth** or the **Anti-logarithms** 10^{-10} of their **g-Position** so , the Antilog $\frac{-g/10}{10} = 0,10460975$ is for the $\rightarrow$ three dimensions Total-Impedance $Z_c = 0,10460975 \cdot (10^{-10})^3 = 1,046097 \cdot 10^{-31}$ and the cave is ,

$r_H = \frac{h}{c Z_c} = \frac{[6,62606957 \cdot 10^{-34}]}{2,99798 \cdot 10^8 \cdot 1,0460975 \cdot 10^{-31}} = 2,1127839 \cdot 10^{-11} \text{ m}$, and it is the Hydrogen cave , i.e.

$L_H = r = \frac{h}{c Z_c} = 2,1127839 \cdot 10^{-11} \text{ m}$ is the minimum-cave in Planck's-cave with max-Energy h .

3.. It was shown that The **[Magnetic-Fields] $\equiv$ [Energy-Baskets] is the Way for Energy Propagation** because the Strength-field $\bar{B}_F = [\frac{2\pi \cdot m \cdot r}{q_T}] \cdot f \equiv \bar{B} = \frac{\pi r^3 \Phi \cdot \sigma}{4} \rightarrow$ is Wave $\equiv \{ [\epsilon E^2 + \mu B^2] = 2 \cdot \lambda c \cdot \sin[\frac{2\pi c}{\lambda}] \}$,

where $\bar{\mathbf{w}} = 2\pi f = \frac{s_p}{m}$, issuing that Tangent of Ellipsoid, $\bar{\mathbf{B}} \perp \bar{\mathbf{w}}$ Vector, and the Tangent of Ellipsoid $\rightarrow \bar{\mathbf{w}} \perp \bar{\mathbf{B}}$ Vector. Also the Moving Electron of charge $\bar{\mathbf{q}} \equiv \ominus$, with the **Orbit-Velocity-Vector**, $\bar{\mathbf{v}}$, as $\bar{\mathbf{v}} = \sqrt{\frac{2}{m} [E - \{\frac{k}{r} + \frac{L^2}{2mr^2}\}]}$, is forming the angle $< \theta$ with $\bar{\mathbf{B}}$ Vector, and **Creates IN ORBIT**, $\mathbf{r}$, the Perpendicular Magnetic-Field $\bar{\mathbf{B}}$, which Magnetic-lines are the Energy (circles **O**) in $\mathbf{B}$, Due to the velocity-constituent $\mathbf{V}_p$, and are Perpendicular to the Magnetic-circles **O**,

$$\text{i.e. The Magnetic-field } \bar{\mathbf{B}}_F = [\frac{2\pi m e}{q_e}]. \mathbf{f} \quad \dots\dots(1)$$

It has been shown [82] that in a cave, say *Hydrogen cave*, Electron-Spin is the Angular-momentum vector $\bar{\mathbf{B}}$ which rotates according to equation, $\frac{d\bar{\mathbf{B}}}{dt} = [\bar{\mathbf{u}}\bar{\mathbf{B}}] = \mathbf{u} \mathbf{B} \cdot [\bar{\mathbf{k}}\bar{\mathbf{k}}']$, in the Gravitational Potential $U_g = [mg].s.\cos\theta = -s.Q.[\bar{\mathbf{k}}\bar{\mathbf{k}}']$, so the change of $\bar{\mathbf{B}}$ is $\rightarrow \frac{d\bar{\mathbf{B}}}{dt} = \mathbf{u} = \frac{s.Q}{\mathbf{B}} = \frac{s.Q}{J_3.w_3}$ and from 1-degree equation of motion, $\leftarrow \mathbf{u} \rightarrow$, which is $\rightarrow \ddot{\mathbf{u}} + \mathbf{w}^2 \mathbf{u} = \mathbf{0} \leftarrow$ and the solution is the **Period of Nutation** $T = \frac{2\pi}{\mathbf{u}} = \frac{2\pi.J_3 w}{s.Q}$, and **Nutation-Frequency** $f_N = \frac{s.Q}{2\pi.J_3 w} \dots(n)$ where, s = amplitude of vibration and $Q = Q_+$ = the force = $[mass.g]$. In the case of Null-Potential in a cave Then, equation (n) is, $f_N = \frac{s.Q_+}{2\pi.J_3 w} = \frac{r.F}{2\pi.(\pi r^4/2)(v/r)} = \frac{r^2 F}{\pi^2 r^4 \bar{v}} = \frac{F}{\pi^2 r^2 \bar{v}} = \frac{r^2 F}{[\frac{B}{f}]\bar{v}} = \frac{r^2 F.f_N}{B.\bar{v}} = \frac{r^2 F.f_N}{S.\bar{v}}$, or force $\mathbf{F} = [\frac{\bar{v}.S}{r^2}] \dots\dots(2)$ and from **Lorentz-force** $\mathbf{F} = \bar{\mathbf{q}} \bar{\mathbf{v}} \times \bar{\mathbf{B}}_F$, and the Magnetic field $\mathbf{q} \mathbf{v} \mathbf{B} = mv^2/r \rightarrow \mathbf{q} \mathbf{B} r = m v = m r \mathbf{v}$ $\bar{\mathbf{B}}_F = \frac{m.2\pi}{q}.f = [\frac{2\pi.m}{Q_+}].f$, then force, $\mathbf{F} = \bar{\mathbf{q}} \bar{\mathbf{v}} \times [\frac{2\pi.m}{Q_+}].f = 2\pi.\bar{\mathbf{q}}\bar{\mathbf{v}}.[\frac{m}{mg}].f \equiv \frac{\bar{v}.S}{r^2}$ or $\rightarrow \frac{2\pi \bar{q}}{g} \mathbf{f} = \frac{S}{r^2}$ and the

$$\text{Magnetic - Force } \bar{\mathbf{B}}_F = \frac{\bar{S}}{q.r^2} \dots(3) \text{ and } \bar{\mathbf{B}}_F = \frac{5,691952.10^{-34}}{1,602.10^{-19}[10^{-19}]^2} = 3,5525851.10^{23} \text{ T, half Plank-M-Field.}$$

The Nutation-Force $\mathbf{F}_N = q c B = 1,602.10^{-19}. [2,9978.10^8]. 3,553.10^{23} \equiv 1,7063.10^{13}$ Newton. Equation (3) relates the Inside existing force, $\mathbf{F}$, which becomes only from Charge Q_+ , from Spin S , and from, $\mathbf{r}$, cave, and in STPL Mechanism creates the, **Six - Forces**, of Nature, i.e.

In the same cave $\mathbf{r}$, Charge Q_+ , creates the Magnetic field $\bar{\mathbf{B}}_F$, in where gravity, $\mathbf{g}$, acts on Charge mass m_+ and creates the Nutation-frequency, f_N , and the Inertial-Force $\mathbf{F}$.

The Hydrogen cave $L_H = \mathbf{r} = \frac{h}{c.Z_c} = 2,1127839.10^{-11} \text{ m}$ is the min-cave in Planck's-cave with the max-Energy h . The cave with **[Anti-Space + Space-Positions]** is $0,707106781.10^{-20} \text{ m}$ and it is the **Border-line** between the, **Weak and Strong Forces** $\equiv |W-S|$, because in this cave exist the maximum Space-Positions. Placing the above $\mathbf{r}$, Nucleus-Cave in charge Q_+ then.

$$\bar{\mathbf{q}} \mathbf{w} \cdot \mathbf{s} = \frac{g.S}{2\pi r^2} = \frac{9,8076754.[5,691952.10^{-34}]}{2\pi.[10^{-20}]^2} = 8,8850576.10^{11} \text{ J} / 1,602.10^{-19} \text{ eV} = 5,546.10^{25} \text{ eV}$$

$$\text{or the Border-line of W-S Forces } \rightarrow \bar{\mathbf{q}} \text{ Weak-Strong } \equiv 5,546.10^{16} \text{ GeV} \leftarrow$$

$$\text{From Magnetic-field } \bar{\mathbf{B}}_F = [\frac{2\pi.m_+}{q_+}].f = [\frac{2\pi.m_+}{q_+}].[\frac{F.f}{\pi^2 r^2 \bar{v}}] = [\frac{2.m_+.F.f}{\pi^2 r^2 \bar{v}.q_+}] \text{ issues, } \mathbf{F} = \bar{\mathbf{q}} \bar{\mathbf{v}} \times \bar{\mathbf{B}}_F = 2\pi.\bar{\mathbf{q}}\bar{\mathbf{v}}.[\frac{f=1}{g}]$$

which is equal to the Nutation-force $\mathbf{F} = [\frac{\bar{v}.S}{r^2}]$, and so $\rightarrow \mathbf{M-Force} \bar{\mathbf{Q}}_{P.E} = \mathbf{f} . \bar{\mathbf{q}}_{\text{Cave}} \equiv \frac{\bar{S}.g}{\bar{c}.r} \equiv \frac{\bar{S}.g}{2\pi r^2} \leftarrow$ are the Potential-Energy-Forces in caves $\mathbf{r}$, from which become all the known Forces, is as

- Gravitational-force as $\mathbf{F}_g = m_e . g = \text{The min-Quantum-Energy } E = 1,745 \text{ eV}$
- Strong - force as $\mathbf{F}_S . r = [\frac{g.S}{2\pi r^2}] = 2,8.10^4 \text{ N for } 10^{-14} < d < 10^{-16} \text{ m,}$
- Electric-force. as $\mathbf{F}_e = q_+. \bar{\mathbf{E}} = 2,8.10^3 \text{ N for } 10^{-\infty} < d < 10^{+\infty} \text{ m,}$
- Magnetic-force as $\mathbf{F}_m = \bar{\mathbf{c}} . \mathbf{q}_+ . \bar{\mathbf{B}}_F = 2,8.10^2 \text{ N for } 10^{-\infty} < d < 10^{+\infty} \text{ m,}$
- Weak - force as $\mathbf{F}_W . r = [\frac{g.S}{2\pi r^2}] = 2,8.10^{-2} \text{ N for } 10^{-17} < d < 10^{-19} \text{ m,}$
- Strong - force as $\mathbf{F}_S . r = [\frac{g.S}{2\pi r^2}] = 2,8.10^4 \text{ N for } 10^{-14} < d < 10^{-16} \text{ m,}$
- X-Strong-force as $\mathbf{F}_{XS} . r = [\frac{n.g.S}{2\pi r^2}] = 2,8.10^{10} \text{ N for } 10^{-17} < d < 10^{-20} \text{ m,}$

Conclusions :

- The Total Impedance Z_c , is either Growth or Anti-Growth depending on the **velocity** $\bar{\mathbf{c}}$ **Energy**, and the Number of Element = Positions, h . Neutrino-cave is $\mathbf{a}_v = 7,0.10^{-21} \text{ m}$
- The Total Impedance $Z_c = 1,0460975.10^{-31} \text{ m}$, for the Three elements $[+, 0, -] \equiv \oplus, \emptyset, \ominus$, $\equiv$ Breakages $\{\mathbf{s}^2 \equiv + \text{Charge}, -\mathbf{s}^2 \equiv - \text{Charge}, 2\mathbf{s}^2 \equiv 0 \text{ Charge}\}$ issues in STPL- Line Common circle, $2r$, which is the Physical-Rotor for the Cosmic-Particles origination.
- The Duality-Photon Energy is $\rightarrow \{\bar{\mathbf{c}} . [\bar{\mathbf{f}}_n] + \bar{\mathbf{c}} . \mathbf{f}_n\} \leftarrow \equiv \rightarrow \text{Particle} + \text{Wave} \leftarrow$ and is NOT becoming from STPL Mechanism, BUT from Prior as an Material-Point. [91].

From Voltage $V = \frac{h.f}{q} = \frac{h.c}{q.\lambda}$ and $\lambda=10^{-7} \text{ m}$ $V = \sqrt[2]{\frac{1}{a^3}} = \sqrt[2]{\frac{1}{10^{-21}}} .4,1361232.10^{-15} = \mathbf{12,398eV}$

4... For the in-Planck's length Spin-Energy **Gamma-ray**, γ , is the minimum Energy in caves

$$E = h f / q = 4,1361232 . 10^{-15} f = 4,1356586.10^{-15} . \sqrt[2]{\frac{1}{r^3}} \leftarrow \text{eV} \text{ and is in the Smallest}$$

acceleration Space-cave $a_\gamma = 1.10^{-15} \text{ m}$ where issues $f_\gamma = 3,1622776.10^{28} \text{ H}$.

5... For the Beyond Planck's length Spin-Energy is $\rightarrow E = [\Phi \frac{\sigma}{4\pi r}] . \bar{B} \equiv \frac{|\mathbf{B}|^2}{2 \pi^2 r^4} \leftarrow$

6... The Resonance-Energy for caves is $E_R = \frac{1}{a^2} [\frac{4\pi^2}{c^2} + \frac{L^2}{2m}] = \frac{1}{a^2} [\frac{4\pi^2}{c^2} + \frac{S^2}{2m}]$, and is a **Signal**

7...From **Lorentz-Force** $F = \bar{q} \bar{v} \times \bar{B}_F = \frac{m.v^2}{r}$ Centripetal-force, and from **Cave-Spin** $S = r m v$, then

Force / cave $\equiv \bar{q} \bar{B} r = mv$ and $\bar{q} \bar{B} = \frac{S}{r^2}$, Common-Force/cave $= [\bar{q} \bar{B} c = \frac{c.S}{r^2}]$, originating E-Caves

i.e. **Forces** $Q_+ = [\frac{c.S}{r^2}] = \frac{2,9978.10^8 . [5,691952.10^{-34}]}{[1,602.10^{-19}] . r^2} = 10,649939.10^{-7} . [\frac{1}{r^2}] \text{ eV} \dots (\text{Cave-Force})$

The Force in Charged-Particle, related to their Cave $r \text{ (m)}$,

$$1\text{-Particle } r = 1.10^{-7} \text{ m} \rightarrow Q_{-7} = 1,0649939.10^{-6} . [\frac{1}{[10^{-7}]^2}] = 10,65.10^7 \text{ eV}.$$

$$2\text{-Particle } r = 1.10^{-8} \text{ m} \rightarrow Q_{-8} = 1,0649939.10^{-6} . [\frac{1}{[10^{-8}]^2}] = 10,65.10^9 \text{ eV}.$$

$$3\text{-Particle } r = 1.10^{-9} \text{ m} \rightarrow Q_{-9} = 1,0649939.10^{-6} . [\frac{1}{[10^{-9}]^2}] = 10,65.10^{11} \text{ eV}.$$

$$4\text{-Particle } r = 1.10^{-10} \text{ m} \rightarrow Q_{-10} = 1,0649939.10^{-6} . [\frac{1}{[10^{-10}]^2}] = 10,65.10^{13} \text{ eV}.$$

$$5\text{-Particle } r = 1.10^{-11} \text{ m} \rightarrow Q_{-11} = 1,0649939.10^{-6} . [\frac{1}{[10^{-11}]^2}] = 10,65.10^{15} \text{ eV}.$$

$$6\text{-Particle } r = 1.10^{-12} \text{ m} \rightarrow Q_{-12} = 1,0649939.10^{-6} . [\frac{1}{[10^{-12}]^2}] = 10,65.10^{17} \text{ eV}.$$

$$7\text{-Particle } r = 1.10^{-13} \text{ m} \rightarrow Q_{-13} = 1,0649939.10^{-6} . [\frac{1}{[10^{-13}]^2}] = 10,65.10^{19} \text{ eV}.$$

$$8\text{-Particle } r = 1.10^{-14} \text{ m} \rightarrow Q_{-14} = 1,0649939.10^{-6} . [\frac{1}{[10^{-14}]^2}] = 10,65.10^{21} \text{ eV}.$$

$$9\text{-Particle } r = \mathbf{1.10^{-15} m} \leftarrow \rightarrow Q_{-15} = 1,0649939.10^{-6} . [\frac{1}{[10^{-15}]^2}] = \mathbf{10,65.10^{23} eV}.$$

$$10\text{-Particle } r = 1.10^{-16} \text{ m} \rightarrow Q_{-16} = 1,0649939.10^{-6} . [\frac{1}{[10^{-16}]^2}] = 10,65.10^{25} \text{ eV}.$$

$$11\text{-Particle } r = 1.10^{-17} \text{ m} \rightarrow Q_{-17} = 1,0649939.10^{-6} . [\frac{1}{[10^{-17}]^2}] = 10,65.10^{27} \text{ eV}.$$

$$12\text{-Particle } r = \mathbf{1.10^{-18} m} \leftarrow \rightarrow Q_{-18} = 1,0649939.10^{-6} . [\frac{1}{[10^{-18}]^2}] = \mathbf{10,65.10^{29} eV}.$$

$$13\text{-Particle } r = 1.10^{-19} \text{ m} \rightarrow Q_{-19} = 1,0649939.10^{-6} . [\frac{1}{[10^{-19}]^2}] = 10,65.10^{31} \text{ eV}.$$

$$14\text{-Particle } r = 1.10^{-20} \text{ m} \rightarrow Q_{-20} = 1,0649939.10^{-6} . [\frac{1}{[10^{-20}]^2}] = 10,65.10^{33} \text{ eV}.$$

$$15\text{-Particle } r = 1.10^{-21} \text{ m} \rightarrow Q_{-21} = 1,0649939.10^{-6} . [\frac{1}{[10^{-21}]^2}] = 10,65.10^{35} \text{ eV}.$$

$$16\text{-Particle } r = 1.10^{-22} \text{ m} \rightarrow Q_{-22} = 1,0649939.10^{-6} . [\frac{1}{[10^{-22}]^2}] = 10,65.10^{37} \text{ eV}.$$

$$17\text{-Particle } r = 1.10^{-23} \text{ m} \rightarrow Q_{-23} = 1,0649939.10^{-6} . [\frac{1}{[10^{-23}]^2}] = 10,65.10^{39} \text{ eV}.$$

$$18\text{-Particle } r = 1.10^{-24} \text{ m} \rightarrow Q_{-24} = 1,0649939.10^{-6} . [\frac{1}{[10^{-24}]^2}] = 10,65.10^{41} \text{ eV}.$$

Voltage in caves becomes from **Lorentz-force** $F = \bar{q} \bar{v} \times \bar{B}_F$, from the Magnetic field, $q v B = mv^2/r$

$\rightarrow q B r = m v = m r w$, and Energy equation $E = h f = F / c = q V$, or $\bar{E} = \nabla V$, i.e.

$$\text{Voltage } V \text{ in a cave } r \text{ is } \rightarrow V = \frac{h.f}{q} = \frac{h}{2\pi q e V} \sqrt[2]{\frac{g}{r^3}} = \frac{6,62606957.10^{-34}}{2\pi.1,602.10^{-19} \sqrt{r^3}} = \mathbf{0,6582148.10^{-15} . \sqrt[2]{\frac{g}{r^3}} \leftarrow}$$

The Voltage in Charged-Particles, and the relation to their **Cave** $r \text{ (m)}$ is,

$$1\text{-Energy in } r = 1.10^{-7} \text{ m} \rightarrow V_{-7} = 0,6582148.10^{-15} . \sqrt[2]{\frac{g}{[1.10^{-7}]^3}} = 6,518653.10^{-5} \text{ eV}.$$

$$2\text{-Energy in } r = 1.10^{-8} \text{ m} \rightarrow V_{-8} = 0,6582148.10^{-15} . \sqrt[2]{\frac{g}{[1.10^{-8}]^3}} = 2,061375.10^{-3} \text{ eV}.$$

$$3\text{-Energy in } r = 1.10^{-9} \text{ m} \rightarrow V_{-9} = 0,6582148.10^{-15} . \sqrt[2]{\frac{g}{[1.10^{-9}]^3}} = 6,518653.10^{-2} \text{ eV}$$

$$4\text{-Energy in } r = 1.10^{-10} \text{ m} \rightarrow V_{-10} = 0,6582148.10^{-15} . \sqrt[2]{\frac{g}{[1.10^{-10}]^3}} = 2,061375.10^0 \text{ eV}.$$

- 5- Energy in $r = 1.10^{-11} \text{ m} \rightarrow V_{-11} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-11}]^3}} = 6,518653.10^2 \text{ eV}$
- 6- Energy in $r = 1.10^{-12} \text{ m} \rightarrow V_{-12} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-12}]^3}} = 2,061375.10^3 \text{ eV}.$
- 7- Energy in $r = 1.10^{-13} \text{ m} \rightarrow V_{-13} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-13}]^3}} = 6,518653.10^4 \text{ eV}$
- 8- Energy in $r = 1.10^{-14} \text{ m} \rightarrow V_{-14} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-14}]^3}} = 2,061375.10^6 \text{ eV}.$
- 9- Energy in $r = 1.10^{-15} \text{ m} \rightarrow V_{-15} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-15}]^3}} = 6,518653.10^7 \text{ eV}$
- 10- Energy in $r = 1.10^{-16} \text{ m} \rightarrow V_{-16} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-16}]^3}} = 2,061375.10^9 \text{ eV}.$
- 11- Energy in $r = 1.10^{-17} \text{ m} \rightarrow V_{-17} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-17}]^3}} = 6,518653.10^{10} \text{ eV}$
- 12- Energy in $r = 1.10^{-18} \text{ m} \rightarrow V_{-18} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-18}]^3}} = 2,061375.10^{12} \text{ eV}.$
- 13- Energy in $r = 1.10^{-19} \text{ m} \rightarrow V_{-19} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-19}]^3}} = 6,518653.10^{13} \text{ eV}$
- 14- Energy in $r = 1.10^{-20} \text{ m} \rightarrow V_{-20} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-20}]^3}} = 2,061375.10^{15} \text{ eV}.$
- 15- Energy in $r = 1.10^{-21} \text{ m} \rightarrow V_{-21} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-21}]^3}} = 6,518653.10^{16} \text{ eV}$
- 16- Energy in $r = 1.10^{-22} \text{ m} \rightarrow V_{-22} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-22}]^3}} = 2,061375.10^{18} \text{ eV}$
- 17- Energy in $r = 1.10^{-23} \text{ m} \rightarrow V_{-23} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-23}]^3}} = 6,518653.10^{19} \text{ eV}$
- 18- Energy in $r = 1.10^{-24} \text{ m} \rightarrow V_{-24} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-24}]^3}} = 2,061375.10^{21} \text{ eV}$
- 19- Energy in $r = 1.10^{-25} \text{ m} \rightarrow V_{-25} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-25}]^3}} = 6,518653.10^{22} \text{ eV}$
- 20- Energy in $r = 1.10^{-26} \text{ m} \rightarrow V_{-26} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-26}]^3}} = 2,061375.10^{24} \text{ eV}$

Remarks :

1.. Caves r , determine the Voltage $V = U$ Potential energy in caves . The Kinetic - Energy is ,

$$K_E = \frac{mv^2}{2} = \frac{m.GM}{2.R} = \frac{GMm}{2.R} , \text{ or } K_E = (1/2) (-P_E) = -\frac{P_E}{2} \text{ and } \rightarrow -P_E = U = 2.K_E \leftarrow$$

The Total-energy is $E = K_E + P_E = K_E - 2.K_E = -K_E$, i.e. **The Potential - Energy P_E is Always - Negative and Twice the Kinetic-Energy , While The Total - Energy E , of any Central-Orbiting-System is Negative .**

This Property $U = 2.K_E = hf = h/T$ is very interesting for caves with changeable frequency because the two unknowns K_E , T , may be measured or be calculated . For Weak Force Z in caves $d = 10^{-17} \text{ m}$

then Period $T = \frac{d}{c} = \frac{10^{-17} \text{ m}}{[2,998.10^8 \text{ m/s}]} = 3,3358.10^{-26} \text{ s}$, and the produced Energy in d , is $E_Z = \frac{h}{T} =$

$$= \frac{1,055.10^{-34} \text{ J.s}}{2.[3,3358.10^{-26} \text{ s}].[1,6022.10^{-19} \text{ J/eV}]} = 98,84.10^9 \text{ eV} \equiv 99 \text{ GeV}$$

2.. From the equation of **Forces $Q_+ = \frac{c.S}{r^2} = 10,649939.10^{-7} \cdot [\frac{1}{r^2}] \text{ eV}$** , is seen that Strong and Weak-Forces

Converge at cave $5,546.10^{-16} \text{ m} \equiv 0,5546.10^{-15} \text{ m} \equiv 0,56 \text{ femtometer}$, and an Voltage $V_{-16} = n.[1/r^2] = 2,06.10^9 \text{ eV}$, to smaller than , $r < 10^{-15} \text{ m}$ caves . The Range of action of forces is analogous to cave in STPL

In all caves **Exist** the Fundamental Particles [The Six-Quarks and The Six-Leptons] , and their Antiparticles as well as **Their combinations** of these twelve monads , **Plus** those of **Forces** .

3.. **Kinetic Energy equation of Elementary-Particles** is given from $E = q V = mc^2/2 \dots\dots(1)$

From $B = r m v = r^2 m w = r^2 m (2\pi f) = \pi^2 . r^4 . f$, then $\rightarrow m = \pi r^2/2 \leftarrow$ and (1) becomes as

$q = \frac{\pi c^2 r^2}{4[V]} = 7,0590672.10^{16} \cdot [\frac{r^2}{V}]$, from above $V = 0,658.10^{-15} \cdot \sqrt{\frac{g}{r^3}}$ and for the three types of Particles ,

$$\text{lepton.. } r = 10^{-15} \text{ m} \rightarrow V_{\text{Leptons-Ecave}} = 0,6582148.10^{-15} \cdot \sqrt{\frac{g}{[1.10^{-15}]^3}} = 6,5188857.10^7 \text{ eV}$$

$$Q_{\text{Leptons-charge}} = 7,0590672 \cdot 10^{16} \cdot \frac{10^{-30}}{[6,5188857 \cdot 10^7]} = 1,082864 \cdot 10^{-21} \text{ C}$$

$$\text{quark.. } r = 10^{-17} \text{ m} \rightarrow V_{\text{Quarks-Ecave}} = 0,6582148 \cdot 10^{-15} \cdot \sqrt{\frac{g}{[1 \cdot 10^{-17}]^3}} = 6,5188857 \cdot 10^{10} \text{ eV}$$

$$Q_{\text{Quarks-charge}} = 7,0590672 \cdot 10^{16} \cdot \frac{10^{-34}}{[6,5188857 \cdot 10^{10}]} = 1,082864 \cdot 10^{-28} \text{ C}$$

$$\text{neutrino.. } r = 10^{-19} \text{ m} \rightarrow V_{\text{Neutrinos-Ecave}} = 0,6582148 \cdot 10^{-15} \cdot \sqrt{\frac{g}{[1 \cdot 10^{-19}]^3}} = 6,5188857 \cdot 10^{13} \text{ eV}$$

and $Q_{\text{Neutrinos-charge}} = 7,0590672 \cdot 10^{16} \cdot \frac{10^{-38}}{[2,0814579 \cdot 10^{13}]} = 1,082864 \cdot 10^{-35} \text{ C}$
 i.e. Energy in Elementary-Particles is related to cave r , and Voltage V of cave .

4... From above is seen the following **Diagram of Forces** in $[\text{eV}]^2$.

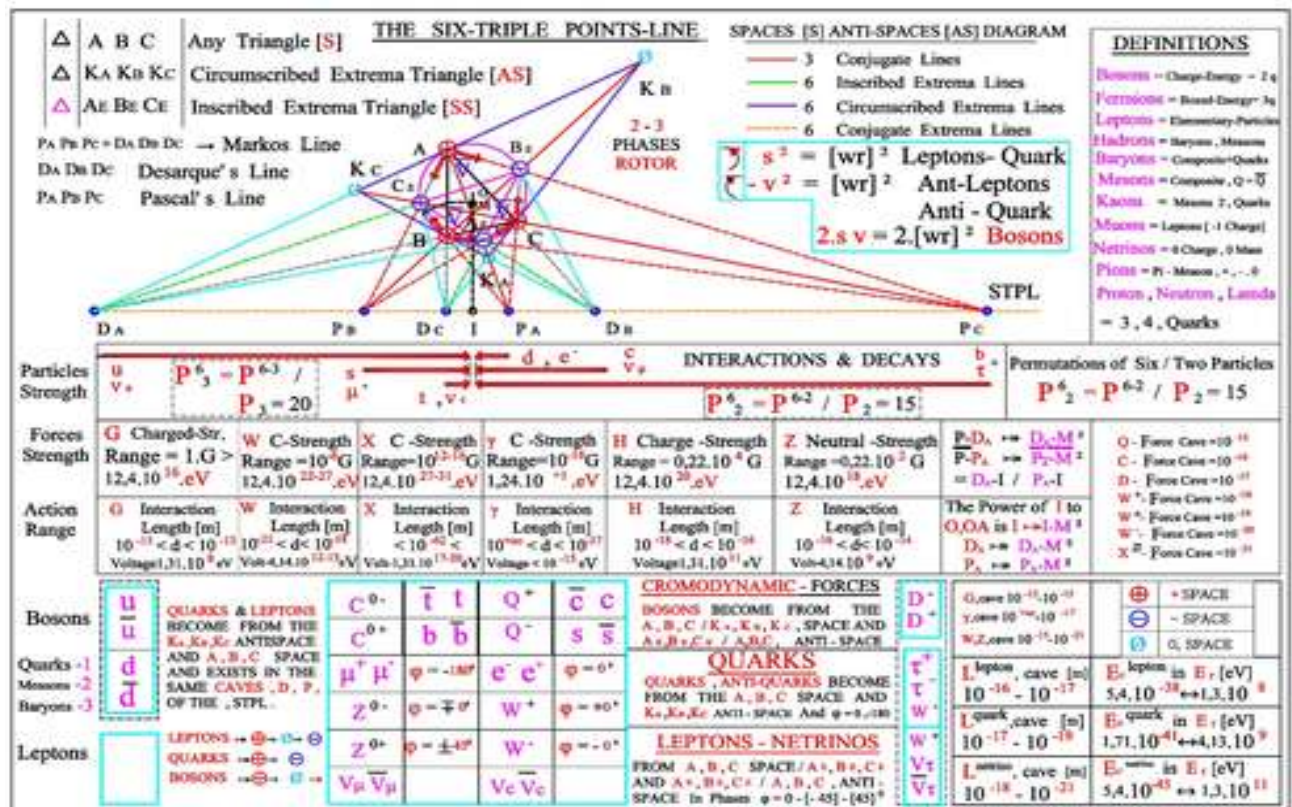
Cave r (m)	Force -	Strength (eV)	Voltage $U \equiv V$ (eV)	Action-Range (m) $\rightarrow$ In r
1.. 10^{-13} m	Gluon G	$Q_G = 12,2 \cdot 10^{14-16} \text{ eV}$	$V_G = 10^9 \text{ eV}$	$a = 10^{-15} \text{ eV} \rightarrow 10^{-[14-15]} \text{ m}$
2.. 10^{-14} m	Weak Z^0	$Q_Z = 12,2 \cdot 10^{13} \text{ eV}$	$V_Z = 10^{10} \text{ eV}$	$a = 10^{-16} \text{ eV} \rightarrow 10^{-[16]} \text{ m}$
3.. 10^{-15} m	Weak Z^1	$Q_Z = 12,2 \cdot 10^{14} \text{ eV}$	$V_Z = 10^{11} \text{ eV}$	$a = 10^{-16} \text{ eV} \rightarrow 10^{-[16]} \text{ m}$
4.. 10^{-16} m	Higgs H^0	$Q_H = 13,6 \cdot 10^1 \text{ eV}$	$V_H = 10^9 \text{ eV}$	$a = 10^{-15} \text{ eV} \rightarrow 10^{-[16]} \text{ m}$
5.. 10^{-17} m	Weak W^+	$Q_W = 12,2 \cdot 10^{10} \text{ eV}$	$V_W = 10^9 \text{ eV}$	$a = 10^{-18} \text{ eV} \rightarrow 10^{-[18]} \text{ m}$
6.. 10^{-18} m	Weak W^0	$Q_W = 12,2 \cdot 10^9 \text{ eV}$	$V_W = 10^{14} \text{ eV}$	$a = 10^{-19} \text{ eV} \rightarrow 10^{-[19]} \text{ m}$
7.. 10^{-19} m	Weak W^-	$Q_W = 12,2 \cdot 10^{10} \text{ eV}$	$V_W = 10^{15} \text{ eV}$	$a = 10^{-20} \text{ eV} \rightarrow 10^{-[20]} \text{ m}$
8.. 10^{-20} m	Strong X^+	$Q_X > 12,4 \cdot 10^{28} \text{ eV}$	$V_X = 10^{17} \text{ eV}$	$a = 10^{-21} \text{ eV} \rightarrow 10^{-[20-23]} \text{ m}$

5... **Question?** How Forces as Strength-Voltage V , (eV), Quarks q , as Charges $(2/3 - 1/3) \cdot e$

Leptons l , as Charges $(-1) \cdot e$ and Neutrinos, ν , with 0 Charge, in Caves, D , P
Linearly Effect (Interact) and How these are **Connected** ???

Answer $\rightarrow$ Charge $D = + \overrightarrow{DI}$, and **Charge of Point P** is $\rightarrow$ Charge $p = - \overrightarrow{PAI}$. (2c-Fig-3) i.e.

It is proved in [90-91] that, External-Power of all Points on STPL is Related only to their (+) Distance $\rightarrow$ and (-) Distance $\leftarrow$ from the Null-Point I , where point, I , is the foot of Perpendicular $OI \perp PD$. i.e.
 D_A Charge-Content $\equiv [D_A M]^2 \equiv | \rightarrow [D_A I] |$, P_A Charge-Content $\equiv [P_A M]^2 \equiv [D_A I] \leftarrow - |$, or
 u -Charge $\equiv$ Charge $u = + \overrightarrow{DAI} = + \frac{2}{3}$, d -Charge $\equiv$ Charge $d = - \overrightarrow{PAI} = - \frac{1}{3}$, linear Effect and Confined.



$$W^+ = [\rightarrow D_A I] > [\leftarrow P_A I], W^- = [\rightarrow D_A I] < [\leftarrow P_A I], W^0 = [\rightarrow D_A I] = [\leftarrow P_A I] \dots (w)$$

Figure –25 - : The [STPL] Physical-Mechanism -Cave-axis of $\rightarrow$ Forces and Energy-Caves $\leftarrow$

2-h... The Origination of Elementary-Forces and the Objective Reality.

Because Force *can't exist by itself*, there must always be an equal and Opposite Reaction-force acting on the Opposite Position or Direction. The **Coulomb-Force** acting between two Particles is $\mathbf{F}_c = \mathbf{C} \frac{q_1 \cdot q_2}{r^2}$

while the Voltage of cave r , is $\mathbf{V}_r = \mathbf{C} \frac{q_1 \cdot q_2}{r}$ and issues $\rightarrow \mathbf{V}_r = \mathbf{F}_c \cdot r$ i.e.

When Two Particles are in a cave, r , then exists an Interaction between the two Particles as follows, **The $\oplus$ Charged-Particle** produces an **Electric-field $\vec{E}$** , which exerts a force $\vec{F}$, on the other charged Particle creating The-**Constructive**, or the **Destructive-Interference** in an Homogenous Harmonic vibration Voltage as the Dynamic Matrix $[\lambda M+K] X = 0$, where $\bar{\lambda} = 1/w^2 = 1/\lambda$ and $w = 2\pi f$.

Strong - Forces are created on, **Markos-STPL**, in Pascal's and Desargues's Six-Triple-Point-Line Points.

Placing Magnetic field $\vec{B}_F = \frac{m \cdot 2\pi}{Q_+} f$, in Centripetal-Lorentz force $\mathbf{F} = \bar{q} \vec{v} \cdot \vec{B}_F = \bar{q} \vec{v} \left[\frac{2\pi \cdot m}{Q_+} f \right]$, becomes

$$\mathbf{F} = 2\pi \cdot \bar{q} \vec{v} \left[\frac{m}{mg} \right] \cdot f \equiv \frac{mv^2}{r} \equiv \frac{S \cdot v}{r^2}, \text{ since Spin } S = r m \vec{v}, \text{ and } 2\pi \cdot \bar{q} \vec{v} \cdot \left[\frac{f}{g} \right] = \frac{\bar{v} \cdot S}{r^2}, \text{ or } \frac{2\pi \bar{q}}{g} r f = \frac{S}{r}$$

and since frequency $f = \frac{\sigma \cdot \Phi}{2\pi r}$ then $\rightarrow \frac{\bar{q}(\sigma \Phi)}{g} = \frac{S}{r}$, which becomes $\rightarrow r \cdot \sigma \cdot \bar{q}_{\text{Cave}} = \frac{S \cdot g}{\Phi} \leftarrow$

From Angular-Momentum-Vector $\vec{B} = \pi^2 \cdot r^4 f \equiv \text{Spin } \pm \vec{S}$ which is equal to $\frac{\pi r^3 \sigma}{2} [1 + \sqrt{5}] \equiv$

$$\pi r^3 \cdot \sigma \Phi \equiv \left[\frac{h}{2\pi} \right] \equiv \frac{2L}{2\pi f}, \text{ then Charge of cave, } r, \text{ is } \rightarrow \bar{q}_{\text{Cave}} = \frac{\bar{S} \cdot g}{\sigma \cdot r \cdot \Phi} \equiv \frac{\bar{S} \cdot g}{\bar{c} \cdot r} \leftarrow \dots (q) \text{ i.e.}$$

Above equation (q) relates the Inside existing, **Spin S** , of cave, r , where **Charges $\bar{q}$** create the forces $\mathbf{F}$. These Charges, $\pm \bar{q}$, { following Spin $\vec{S}$ are $\oplus$ or $\ominus$ } when are found in STPL Mechanism create the Coulomb-forces, $\mathbf{F}$, which are either Repulsion or Attractive, and which Forces Joint the Charges, $\pm \bar{q}$, independently of Charge-Type, and so is done **The-Origination of the First Six-Forces and Anti-Forces**. The moving Charged Particle, $\oplus$ or $\ominus$, Produces a **Magnetic-field $\vec{B}_F$** , which exerts a Force $\vec{F}$ on other moving charges. Any Obstacle, or The Force $\vec{F}$ of these Charges is always Perpendicular to the Direction of their Velocity vector so the **Velocity-magnitude** does not change while the **Direction** of the Velocity vector changes. By this way, **of the Two Transverse motions**, is created an **Electromagnetic Wave in cave r** , with Wavelength $\lambda = 2r$, on the Two or more Possible nodes of the Wave -Wavelength, i.e.

It is a **Standing-Wave**, with the **Two**, $\oplus$ or $\ominus$, $\pm$ **Charges** at their **Two-nodes**.

The Double-Orbital-Periodic motion $[\oplus \leftrightarrow \ominus]$ in above Material-Point is the Eternal-Plane-curve motion of the $\oplus$ constituent to the $\ominus$ constituent in The Two axis, x, z , of motion.

The above **Double-Orbital-motion** is in a Uniform-Energy-Pointy-Space as this is for Spin $S = \vec{B}$, so Issues for Spin $\rightarrow |\vec{B}| = \bar{r} m \vec{v} = \bar{r} \cdot [m \vec{v}] = \sqrt{|\vec{r}|^2 + m^2 |\vec{v}|^2}$, since $\bar{r} \equiv$ The Space, and which is Perpendicular to, $|m\vec{v}| \equiv$ The Energy Part $\equiv$ The Anti-Space, where issues $\rightarrow \bar{r} \perp \uparrow m \vec{v}$, or $\rightarrow \uparrow$.

Above indicates, **The Origination of Everything, through The Existence of Opposites, $[\oplus \rightarrow \ominus]$** , in All Spaces levels independently of their magnitudes and or Orientations.

The Spin magnitudes, $1/2, 1, 2$, of r caves, is acquired as that of **Photon-Angular-velocity $|\vec{w}| = \sigma \Phi / r$** .

The **Two-Types of charges $\bar{q} \rightarrow \oplus, \ominus$** , consist the Sources of Electromagnetic fields while **masses** for Gravitational field, and now from Centrifugal-Force F_g , **is the Impedance $\equiv$ mass** of Planck- Cave L_p .

Above **Dual Property of Spin, $\vec{S}$** , simultaneously as { **Space + Energy** } in caves $\rightarrow \vec{S} \equiv \frac{\bar{c} \cdot r}{g} \bar{q} \leftarrow$

is created from the Two-Types of Charges $\pm \bar{q}$, which are the Sources of Electromagnetism and vice versa, from Charges $\pm \bar{q}$, the Coulomb-forces $\mathbf{F}$, which Forces Joint the Charges through the Three Passages, **Constructive $[\oplus \rightarrow (+) \leftarrow \oplus]$ or $[\ominus \rightarrow (+) \leftarrow \ominus]$** , and to the **Destructive $[\oplus \rightarrow (-) \rightarrow \ominus]$ Interference**.

Furthermore the very interesting Question for Chemistry is The, **WHY Atoms Bond** and create the Molecules. An answer in [82-88]. (P-11) markos 24 / 12 / 2019

- 1..The $\oplus$ Breakage being alternative at Space-Points, **A, B, C**, **Attacks $\rightarrow$** to The $\ominus$ **Charges** at Anti-Space Points, **K_A, K_B, K_C**, and Forms **Leptons** { **e⁻, μ^+ , τ^+ , ν_e , ν_μ , ν_τ** } and **Quarks** { **d, s, b, u, c, t** } on STPL Points, **P_A, P_B, P_C - D_A, D_B, D_C**, with the **3-Types-Forces**, and through **circular-Passages**.
- 2.. Because The $\oplus$ Breakage **Attacks $\Rightarrow$** To $\ominus$ **Charge**, Thus Anti-Particles are Generated only from the Opposite-motion, **The Opposite Direction**, in their Conductors **D, P $\rightarrow$ I $\leftarrow$ P, D**.
- 3.. From [91] The Geometry of STPL line, allows Six Quantities on the Three Loads as issues in The **Artificial**

3-Phase-Star-Circuit and to This , **Physical 4-Phase-Delta-Circuit** , with Quantities Q_{AK_A} ,and Q_{AEK_A} Passing through **3-circular-Passages** between Spaces , before launched at P_A and D_A Points of STPL .

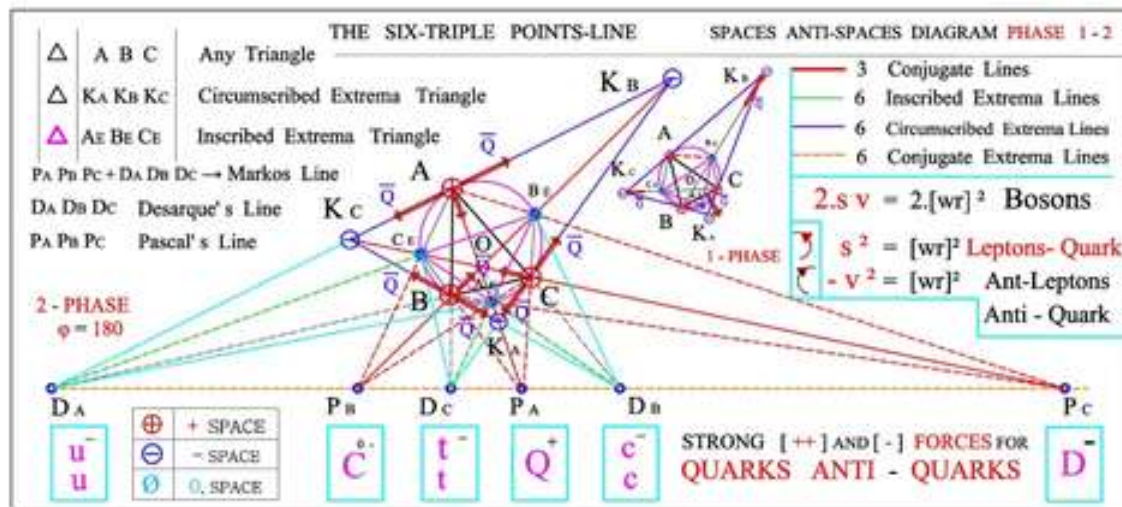


Figure - 26 - : The Physical-Rotor in [STPL]-Mechanism Produces at Pascal's and Desargues Points $P_A, P_B, P_C, D_A, D_B, D_C$, **Elementary- Forces** and Strong **Quarks** $q = \frac{3}{3}$ In the [STPL]-Mechanism Producing , The Strong-Forces , Quarks and Anti-Quarks .

3-h... The Origination and Decays , of Cosmic Particles :

[F + Q] **The Interactions of Space , Anti-Space for $\rightarrow$ Strong Forces – Quarks $\leftarrow$ Origination .**

As in Electro-Magnets $\oplus \rightarrow \ominus \equiv \ominus \leftarrow \oplus$ changes the Flow of Charges , in the Same Way $\oplus$ -Space interacts with $\ominus$ -Anti-Space ,and by interchanging the Poles are created Strong-Forces. This Procedure is continually executed in $\rightarrow$ [STPL] Geometrical-Mechanism which is $\rightarrow$ A Big-Magnet $\leftarrow$ as follows ,

- 1A.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w}xr.:|^2 \equiv \oplus$ being at Point A $\rightarrow$ **Attacks Breakage Charge , - $s^2 = \ominus$** at Point K_A with an **Impressed-Force** $Q_{AK_A} = Z_{AK_A} \frac{d}{r} \equiv |\vec{e}| \times \frac{3}{3}$, with $\vec{c}$ velocity and forms the Quantum **Chromodynamics-Force** { Q^+ } in Conductor $[\frac{d=AK_A}{AK_A}] = \frac{3}{3}$, as $\frac{3|\vec{e}|}{3}$, and launched into P_A STPL-Point.
- 2.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w}xr.:|^2 \equiv \oplus$ being at Point B $\rightarrow$ **Attacks Breakage Charge , - $s^2 = \ominus$** at Point K_B with an **Impressed-Force** $Q_{BK_B} = Z_{BK_B} \frac{d}{r} \equiv |\vec{e}| \times \frac{3}{3}$, with $\vec{c}$ velocity and forms the Quantum **Chromodynamics-Force** { C^{0-} } in Conductor $[\frac{d=BK_B}{BK_B}] = \frac{3}{3}$, as $\frac{3|\vec{e}|}{3}$, and launched into P_B STPL-Point.
- 3.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w}xr.:|^2 \equiv \oplus$ being at Point C $\rightarrow$ **Attacks Breakage Charge , - $s^2 = \ominus$** at Point K_C with an **Impressed-Force** $Q_{CK_C} = Z_{CK_C} \frac{d}{r} \equiv |\vec{e}| \times \frac{3}{3}$, with $\vec{c}$ velocity and forms Quantum **Chromodynamics-Force** { D^- } in Conductor $[\frac{d=CK_C}{CK_C}] = \frac{3}{3}$, as $\frac{3|\vec{e}|}{3}$, and launched into P_C STPL-Point.
- 2A.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w}xr.:|^2 \equiv \oplus$ being at Point A $\rightarrow$ **Attacks Breakage Charge , - $s^2 = \ominus$** at Point K_B with an **Impressed-Force** $Q_{AK_B} = Z_{AK_B} \frac{d}{r} \equiv |\vec{e}| \times \frac{3}{3}$, with $\vec{c}$ velocity and forms **Anti -Up - Quark** { $\bar{u}$ } , in Conductor $[\frac{d=AK_B}{AK_A}] = -\frac{2}{3}$ as $\frac{-2|\vec{e}|}{3}$, and launched into D_A STPL-Point.
- 2.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w}xr.:|^2 \equiv \oplus$ being at Point A $\rightarrow$ **Attacks Breakage Charge , - $s^2 = \ominus$** at Point K_C with an **Impressed-Force** $Q_{AK_C} = Z_{AK_C} \frac{d}{r} \equiv |\vec{e}| \times \frac{3}{3}$, with $\vec{c}$ velocity and forms **Up-Quark** { u } , in Conductor $[\frac{d=AK_C}{AK_A}] = -\frac{2}{3}$ as $\frac{2|\vec{e}|}{3}$, and launched into D_A STPL-Point.
- 3.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w}xr.:|^2 \equiv \oplus$ being at Points , B , C , $\rightarrow$ **Attacks Breakage Charge , - $s^2 = \ominus$** , and at Points K_C, K_A, K_B , with an **Impressed-Force** $Q_{BK_C|BK_A} = Z_{BK_C} \frac{d}{r} \equiv |\vec{e}| \times \frac{2}{3}$, with $\vec{c}$ velocity and forms **Anti-Charm -Quark** { $\bar{c}$ } in Conductor $[\frac{d=BK_C}{BK_B}] = -\frac{2}{3}$ as $\frac{-2|\vec{e}|}{3}$, and launched into D_B STPL- Point , **and** **Charm - Quark** { c } , in Conductor $[\frac{d=BK_A}{BK_B}] = \frac{2}{3}$ as $\frac{2|\vec{e}|}{3}$, and launched into D_B STPL-Point . From C , **Anti-Top - Quark** { $\bar{t}$ } , in Conductor $[\frac{d=CK_B}{CK_C}] = -\frac{2}{3}$ as $\frac{-2|\vec{e}|}{3}$, and launched into D_C STPL - Point , **and**

Top - Quark { t }, in Conductor $[\frac{d=BK_C}{BK_B}] = \frac{2}{3}$ as $\frac{2|\bar{e}|}{3}$, and launched into D_C STLP-Point ,

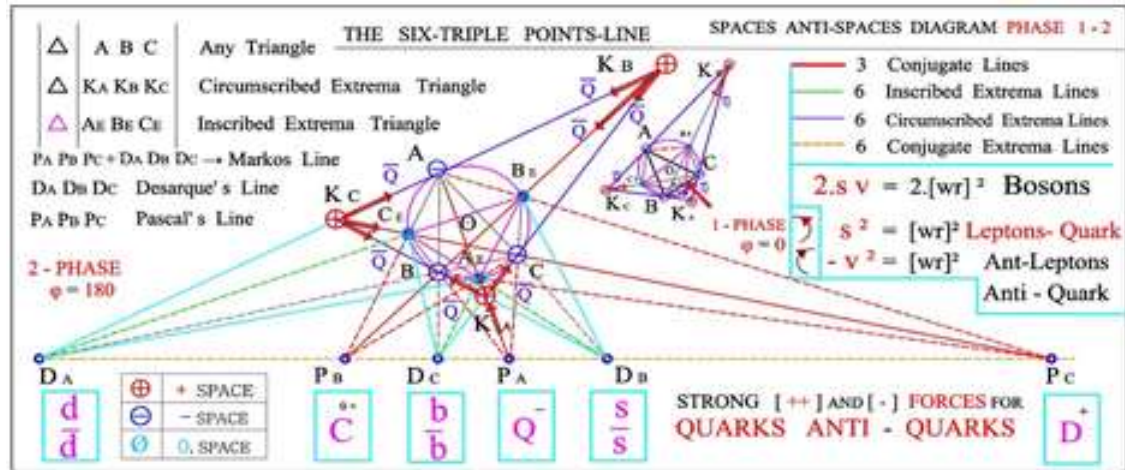


Figure - 27 - : The [STPL]-Mechanism Producing ,The Strong-Forces Quarks and Anti-Quarks [F + Q] :

The Interactions of Space , Anti-Space for $\rightarrow$ Strong Forces – Weak-Quarks $q = \frac{1}{3} \leftarrow$ Origination .

- 1B.. Breakage $s^2 = +|\bar{v}|^2 = |\bar{w}x r.:|^2 \equiv \oplus$ being at Point $K_A \rightarrow$ **Attacks Breakage Charge** , - $s^2 = \ominus$ at $K_A A$, Point A with an **Impressed-Force** $Q_{K_A A} = Z_{K_A A} \frac{-d}{r} \equiv |\bar{e}| \times -\frac{3}{3}$, with , $\bar{c}$ velocity and forms Quantum **Chromodynamics-Force** { Q^- } in Conductor $[\frac{d=K_A A}{AK_A}] = \frac{3}{3}$, as $\frac{-3|\bar{e}|}{3}$, and launched into P_A STLP-Point.
- 2.. Breakage $s^2 = +|\bar{v}|^2 = |\bar{w}x r.:|^2 \equiv \oplus$ being at Point $K_B \rightarrow$ **Attacks Breakage Charge** , - $s^2 = \ominus$ at Point B with an **Impressed-Force** $Q_{K_B B} = Z_{K_B B} \frac{d}{r} \equiv |\bar{e}| \times \frac{3}{3}$, with , $\bar{c}$ velocity and forms the Quantum **Chromodynamics-Force** { C^{0+} } in Conductor $[\frac{d=K_B B}{BK_B}] = \frac{3}{3}$, as $\frac{3|\bar{e}|}{3}$, and launched into P_B STLP-Point.
- 3.. Breakage $s^2 = +|\bar{v}|^2 = |\bar{w}x r.:|^2 \equiv \oplus$ being at Point $K_C \rightarrow$ **Attacks Breakage Charge** , - $s^2 = \ominus$ at Point C with an **Impressed-Force** $Q_{K_C C} = Z_{K_C C} \frac{d}{r} \equiv |\bar{e}| \times \frac{3}{3}$, with , $\bar{c}$ velocity and forms the Quantum **Chromodynamics-Force** { D^+ } in Conductor $[\frac{d=K_C C}{CK_C}] = \frac{3}{3}$, as $\frac{3|\bar{e}|}{3}$, and launched into P_C STLP-Point.
- 2B.. Breakage $s^2 = +|\bar{v}|^2 = |\bar{w}x r.:|^2 \equiv \oplus$ being at Points , $K_A \rightarrow$ **Attacks Breakage Charge** , - $s^2 = \ominus$, and at Points B , C , with an **Impressed-Force** $Q_{K_A B|K_A C} = Z_{K_A B} \frac{d}{r} \equiv |\bar{e}| \times \frac{1}{3}$, with $\bar{c}$ velocity and forms the **Anti-Strange -Quark** { $\bar{s}$ } in Conductor $[\frac{d=K_A B}{BK_A}] = -\frac{1}{3}$ as $\frac{-1|\bar{e}|}{3}$, and launched into D_B STLP- Point , **and** **Anti -Bottom - Quark** { $\bar{b}$ } , in Conductor $[\frac{d=K_A C}{CK_C}] = -\frac{1}{3}$ as $\frac{-1|\bar{e}|}{3}$, and launched into D_C STLP – Point.
- 3B.. Breakage $s^2 = +|\bar{v}|^2 = |\bar{w}x r.:|^2 \equiv \oplus$ being at Points , $K_B \rightarrow$ **Attacks Breakage Charge** , - $s^2 = \ominus$, and at Points C , A , with an **Impressed-Force** $Q_{K_B C|K_B A} = Z_{K_B C} \frac{d}{r} \equiv |\bar{e}| \times \frac{1}{3}$, with $\bar{c}$ velocity and forms the **Bottom -Quark** { b } , in Conductor $[\frac{d=K_B C}{BK_B}] = -\frac{1}{3}$ as $\frac{-1|\bar{e}|}{3}$, and launched into D_C STLP- Point , **and** **Down - Quark** { d } , in Conductor $[\frac{d=K_B A}{BK_B}] = -\frac{1}{3}$ as $\frac{-1|\bar{e}|}{3}$, and launched into D_A STLP – Point.
- 4B.. Breakage $s^2 = +|\bar{v}|^2 = |\bar{w}x r.:|^2 \equiv \oplus$ being at Points , $K_C \rightarrow$ **Attacks Breakage Charge** , - $s^2 = \ominus$, and at Points A , B , with an **Impressed-Force** $Q_{K_C A|K_C B} = Z_{K_C A} \frac{d}{r} \equiv |\bar{e}| \times \frac{1}{3}$, with $\bar{c}$ velocity and forms the **Anti-Down-Quark** { $\bar{d}$ } in Conductor $[\frac{d=K_C A}{CK_C}] = -\frac{1}{3}$ as $\frac{-1|\bar{e}|}{3}$, and launched into D_A STLP- Point , **and** **Strange - Quark** { s } , in Conductor $[\frac{d=K_C B}{CK_C}] = -\frac{1}{3}$ as $\frac{-1|\bar{e}|}{3}$, and launched into D_B STLP – Point .

Remarks :

BOSONS are formed **Axially** In-Common-circle from $\oplus$ -Space , A , B , C , $\ominus$ -Anti-Space K_A , K_B , K_C , and acquire their , ± 1 Spin , from their Tangential-Conductors AK_C , $AK_B - BK_A$, $BK_C - CK_B$, CK_A , on Quantities $Q_{\pm} = \frac{\bar{S}.g}{\sigma.r.\Phi} = \frac{\bar{S}.g}{\bar{c}.r}$, when are Launched in AK_A , BK_B , CK_C , Conductors . The same for the **Quarks** , from The-Axial and Tangential-Magnets , while **Charges** are acquired from The **Voltage - Force** $\equiv$ **Magnet** $\equiv \oplus \rightarrow \ominus$, between the Primary Breakages , s^2 , - s^2 . The **Weak - Forces** and **Leptons** are also formed in Common-circle , But from the same Axial-Magnets Only as in Fig - 28 , 29 .

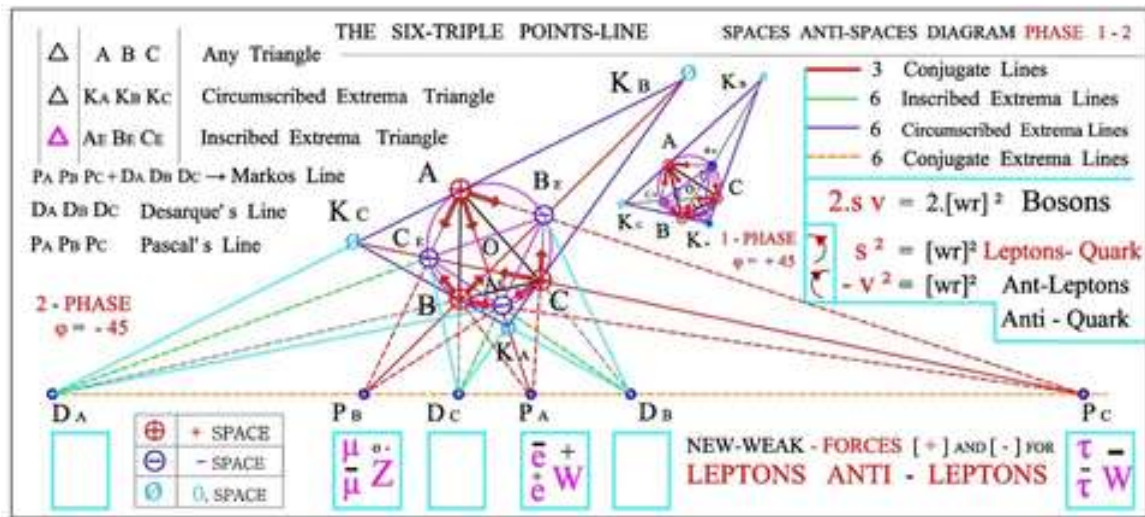


**Figure - 28 – The [STPL]-Mechanism Produces the Weak-Forces , Leptons and Anti-Leptons :
[F + L] Interactions of Space , Anti-Space for Forces , Strong-Leptons $q = -1$, Origination .**

- 1C.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w}xr \cdot|^2 \equiv \oplus$ being at Point A $\rightarrow$ **Attacks Breakage Charge , - $s^2 = \ominus$** at Point A_E with an **Impressed-Force** $Q_{AAE} = Z_{AAE} \frac{d}{r} \equiv |\vec{e}| \times \frac{3}{3}$, with $\vec{c}$ velocity and forms the Weak **Electroweak-Force** $\{ W^+ \}$ in Conductor $[\frac{d=AAE}{AAE}] = \frac{3}{3}$, as $\frac{3|\vec{e}|}{3}$, and launched into P_A STLP-Point.
- 2.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w}xr \cdot|^2 \equiv \oplus$ being at Point B $\rightarrow$ **Attacks Breakage Charge , - $s^2 = \ominus$** at Point B_E with an **Impressed-Force** $Q_{BBE} = Z_{BBE} \frac{d}{r} \equiv |\vec{e}| \times \frac{3}{3}$, with $\vec{c}$ velocity and forms the Weak **Electroweak-Force** $\{ Z^{0-} \}$ in Conductor $[\frac{d=BBE}{BBE}] = \frac{3}{3}$, as $\frac{3|\vec{e}|}{3}$, and launched into P_B STLP-Point.
- 3.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w}xr \cdot|^2 \equiv \oplus$ being at Point C $\rightarrow$ **Attacks Breakage Charge , - $s^2 = \ominus$** at Point C_E with an **Impressed-Force** $Q_{CCE} = Z_{CCE} \frac{d}{r} \equiv |\vec{e}| \times \frac{3}{3}$, with $\vec{c}$ velocity and forms the Weak **Electroweak-Force** $\{ W^- \}$ in Conductor $[\frac{d=CCE}{CCE}] = \frac{3}{3}$, as $\frac{3|\vec{e}|}{3}$, and launched into P_C STLP-Point.
- 2C.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w}xr \cdot|^2 \equiv \oplus$ being at Point , A $\rightarrow$ **Attacks Breakage Charge , - $s^2 = \ominus$** , and at Points B_E, C_E , with an **Impressed-Force** $Q_{ABE|ACE} = Z_{ABE} \frac{d}{r} \equiv |\vec{e}| \times \frac{3}{3}$, with $\vec{c}$ velocity and forms **Tau - Lepton** $\{ \tau^+ \}$, in Conductor $[\frac{d=ABE}{ABE}] = -\frac{3}{3}$ as $\frac{3|\vec{e}|}{3}$, and launched into P_C STLP- Point , **and** **Anti-Muon-Lepton** $\{ \mu^- \}$, in Conductor $[\frac{d=ACE}{ACE}] = \frac{3}{3}$ as $\frac{3|\vec{e}|}{3}$, and launched into P_B STLP-Point.
- 3C.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w}xr \cdot|^2 \equiv \oplus$ being at Point , B $\rightarrow$ **Attacks Breakage Charge , - $s^2 = \ominus$** , and at Points C_E, A_E , with an **Impressed-Force** $Q_{BCE|BAE} = Z_{BCE} \frac{d}{r} \equiv |\vec{e}| \times \frac{3}{3}$, with $\vec{c}$ velocity and forms **Electron** $\{ e^- \}$, in Conductor $[\frac{d=BCE}{BCE}] = -\frac{3}{3}$ as $\frac{3|\vec{e}|}{3}$, and launched into P_A STLP- Point , **and** **Anti - Tau - Lepton** $\{ \tau^- \}$, in , Conductor $[\frac{d=BAE}{BAE}] = \frac{3}{3}$ as $\frac{3|\vec{e}|}{3}$, and launched into P_C STLP-Point.
- 4C.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w}xr \cdot|^2 \equiv \oplus$ being at Point , C $\rightarrow$ **Attacks Breakage Charge , - $s^2 = \ominus$** , and at Points A_E, B_E , with an **Impressed-Force** $Q_{CAE|CBE} = Z_{CAE} \frac{d}{r} \equiv |\vec{e}| \times \frac{3}{3}$, with $\vec{c}$ velocity and forms **Muon - Lepton** $\{ \mu^+ \}$, in Conductor $[\frac{d=CAE}{CBE}] = -\frac{3}{3}$ as $\frac{3|\vec{e}|}{3}$, and launched into P_B STLP- Point , **and** **Positron** $\{ e^+ \}$, in Conductor $[\frac{d=CBE}{CBE}] = \frac{3}{3}$ as $\frac{3|\vec{e}|}{3}$, and launched into P_A STLP-Point.

Remarks :

The Chromodynamics - Forces $\{ Q^\mp \}$, $\{ C^{\pm 0 \mp} \}$, $\{ D^\mp \}$, are created in Conductors with vibrations of Phases difference , $-180^\circ, \pm 90^\circ$, and **Strong-Weak Quarks** of Phases difference , $\pm 90^\circ, \pm 30^\circ$. Because of the Tetrahedron-Pivot-Direction as in Conductor , Forces fit to the Color-Space-conversions.

The Weak-Forces $\{ W^\pm \}$, $\{ Z^{0 \mp} \}$, $\{ W^\mp \}$, are created in Conductors with vibration of Phases difference $+60^\circ, -120^\circ$, and **Strong-Weak Leptons** of Phases difference , $-120^\circ, +60^\circ$.

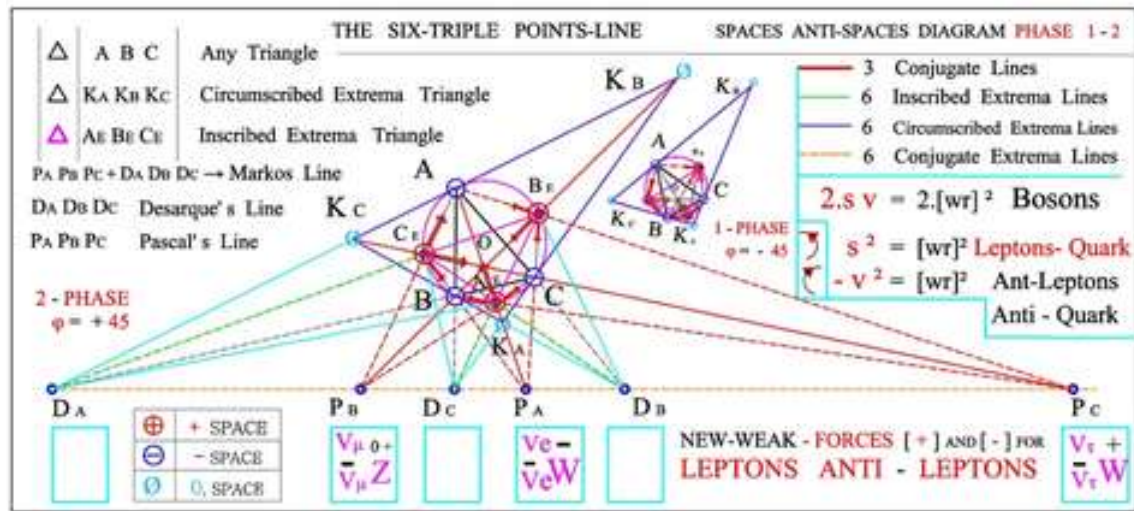


Figure - 29 - : The [STPL]-Mechanism Produces the Weak-Forces , Leptons and Anti-Leptons :

[F + L] Interactions of Space , Anti-Space for Forces , Weak-Leptons $q = \pm 0$, Origination .

- 1D.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w} \times \vec{r}|^2 \equiv \oplus$ being at Point $A_E \rightarrow$ **Attacks Breakage Charge** , $-s^2 = \ominus$ at Point A , Point A with an **Impressed-Force** $Q_{A_EA} = Z_{A_EA} \frac{-d}{r} \equiv |\vec{e}| x \frac{-3}{3}$, with , $\vec{c}$ velocity and forms the Weak **Electroweak-Force** { W^- } in Conductor $[\frac{d=A_EA}{AAE}] = -\frac{3}{3}$, as $\frac{-3|\vec{e}|}{3}$, and launched into P_A STLP - Point.
- 2.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w} \times \vec{r}|^2 \equiv \oplus$ being at Point $B_E \rightarrow$ **Attacks Breakage Charge** , $-s^2 = \ominus$ at Point B , Point B with an **Impressed-Force** $Q_{B_EB} = Z_{B_EB} \frac{-d}{r} \equiv |\vec{e}| x \frac{-3}{3}$, with , $\vec{c}$ velocity and forms the Weak **Electroweak-Force** { Z^{0+} } in Conductor $[\frac{d=B_EB}{BBE}] = -\frac{3}{3}$, as $\frac{-3|\vec{e}|}{3}$, and launched into P_B STLP-Point.
- 3.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w} \times \vec{r}|^2 \equiv \oplus$ being at Point $C_E \rightarrow$ **Attacks Breakage Charge** , $-s^2 = \ominus$ at Point C , Point C with an **Impressed-Force** $Q_{C_EC} = Z_{C_EC} \frac{-d}{r} \equiv |\vec{e}| x \frac{-3}{3}$, with , $\vec{c}$ velocity and forms the Weak **Electroweak-Force** { W^+ } in Conductor $[\frac{d=C_EC}{CEE}] = \frac{3}{3}$, as $\frac{-3|\vec{e}|}{3}$, and launched into P_C STLP - Point.
- 2D.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w} \times \vec{r}|^2 \equiv \oplus$ being at Point , $A_E \rightarrow$ **Attacks Breakage Charge** , $-s^2 = \ominus$, and at Points , B , C with an **Impressed-Force** $Q_{A_EB|A_EC} = Z_{BAE} \frac{d}{r} \equiv |\vec{e}| x \frac{-3}{3}$, with $\vec{c}$ velocity and forms **Anti-Muon-Neutrino** { $\bar{\nu}_\mu$ } , in Conductor $[\frac{d=BAE}{BAE}] = -\frac{3}{3}$ as $\frac{3|\vec{e}|}{3}$, and launched into P_C STLP- Point , **and** **Tau-Neutrino** { ν_τ } , in Conductor $[\frac{d=CAE}{CAE}] = \frac{3}{3}$ as $\frac{-3|\vec{e}|}{3}$, and launched into P_B STLP-Point.
- 3D.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w} \times \vec{r}|^2 \equiv \oplus$ being at Point , $B_E \rightarrow$ **Attacks Breakage Charge** , $-s^2 = \ominus$, and at Points , C , A with an **Impressed-Force** $Q_{B_EC|B_EA} = Z_{CBE} \frac{d}{r} \equiv |\vec{e}| x \frac{3}{3}$, with $\vec{c}$ velocity and forms **Anti-Electron-Neutrino** { $\bar{\nu}_e$ } , in Conductor $[\frac{d=CBE}{BEC}] = \frac{3}{3}$ as $\frac{3|\vec{e}|}{3}$, and launched into P_A STLP- Point , **and** **Muon -Neutrino** { ν_μ } , in Conductor $[\frac{d=ABE}{ABE}] = \frac{3}{3}$ as $\frac{-3|\vec{e}|}{3}$, and launched into P_C STLP-Point.
- 4D.. Breakage $s^2 = +|\vec{v}|^2 = |\vec{w} \times \vec{r}|^2 \equiv \oplus$ being at Point , $C_E \rightarrow$ **Attacks Breakage Charge** , $-s^2 = \ominus$, and at Points , A , B with an **Impressed-Force** $Q_{C_EA|C_EB} = Z_{ACE} \frac{-d}{r} \equiv |\vec{e}| x \frac{-3}{3}$, with $\vec{c}$ velocity and forms **Anti-Tau-Neutrino** { $\bar{\nu}_\tau$ } , in Conductor $[\frac{d=ACE}{CEA}] = -\frac{3}{3}$ as $\frac{-3|\vec{e}|}{3}$, and launched into P_B STLP-Point, **and** **Electron-Neutrino** { ν_e } , in Conductor $[\frac{d=BC_E}{BCE}] = \frac{3}{3}$ as $\frac{3|\vec{e}|}{3}$, and launched into P_A STLP-Point.

Remarks :

Electromotive-Force $\rightarrow F = \vec{q} \vec{v} \times \vec{B}_F = Q_{\pm A} \rightarrow \frac{v \cdot \vec{S}}{r^2} \equiv |\frac{c \cdot \vec{S}}{r^2}| \equiv G$. **Because In Elementary-Particles** { The Forces = F Leptons = L , Quark = Q } **Charges** oscillate into **Inner-Connectors** $\equiv$ **Conductors** , therefore **Electromagnetic-Forces** become from the Oscillation of , $\oplus$, $\ominus$ **Charges in caves** , **Short-Range-Forces** , Proportional to the Positions these occupy in caves, $\vec{q}_{\text{Electron}} = \frac{G}{c \sqrt{2}}$, $\vec{q}_{\text{Cave}} = \frac{\vec{S} \cdot \vec{g}}{\sigma \cdot r \cdot \Phi} \equiv \frac{\vec{S} \cdot \vec{g}}{c \cdot r}$ while for the Outer Tangential-Connectors become the **Electromagnetic-Forces** , **the Long-Range-Forces** , **Gamma-ray** γ , For both cases **Rotating-Pivot** is the Tangential-Electromotive-Force on **Cebas-Quadrilateral-Tetrahedron**. It is known that a **Force F** , is Any influence that causes an Object to , Undergo a Change in speed , a Change in Direction , or a Change in Shape . In Material-Geometry the $[\oplus]$ Charge Attacks $[\ominus]$ Charge , **the motion** ,

and are created Interactions between the Charges . All Above actions happen in Sub-Space and 12 Leptons , 12 Quarks , 12 kind of Forces , are launched into the Pascal **P** , Desargues **D** , Points which occupy a different **Energy-Magnitude** and **Voltage** . The Two Positions of these $[\oplus]$, $[\ominus]$, Charges exist in the Standing and Travelling-Wave , since there are only Two-Positions , **Possible-nodes** , in a Wavelength $\lambda = 2r$. From above **Force** , means the Interaction between two , $[\oplus]$, $[\ominus]$, Charges in Sub-Space of STPL-Mechanism.

As is **Duality-Photon** $\rightarrow \{ \bar{c} \cdot \boxed{f_n} + \bar{c} \cdot f_n \} \leftarrow \equiv$ Stationary- Storage in Standing-Wave + Travelling -Wave $\rightarrow$ Particle + Wave $\leftarrow$ issues that **Force F** is the Space $\rightarrow$ Anti-Space influence of the , $[\oplus]$, $[\ominus]$, Charges at the Two - Positions of Store-Wavelength , $\lambda = 2r$. The Two Positions in Wavelength follow all laws of Mechanics and the Cauchy-Stresses . From **Lorentz-Force** $\mathbf{F} = \bar{q} \mathbf{v} \times \bar{\mathbf{B}}_F = 2\pi \cdot \bar{q} \cdot \bar{v} \cdot \left[\frac{f=1}{g} \right]$ equation , and from

Nutation-Force $\mathbf{F} = \left[\frac{\bar{v} \cdot S}{r^2} \right]$ is found the **Common Charge** $\bar{q} = Q_+ = \left[\frac{g \cdot S}{2\pi r^2} \right]$, which originates Forces as ,

Forces $Q_+ = \left[\frac{g \cdot S}{2\pi r^2} \right] = \frac{9,8076754 \cdot [5,691952 \cdot 10^{-34}]}{2 \cdot \pi \cdot [1,602 \cdot 10^{-19}] \cdot r^2} = 5,5457194 \cdot 10^{-15} \left[\frac{1}{r^2} \right] \text{ eV} \dots\dots\dots (\text{Forces})$

Voltage in caves becomes from **Lorentz-force** $\mathbf{F} = \bar{q} \mathbf{v} \times \bar{\mathbf{B}}_F$, from the Magnetic field $q v B = mv^2/r \rightarrow q B r = m v = m r w$, and Energy equation $E = h f = F / c = q V$, i.e.

Voltage V in a cave r is $\rightarrow V = \frac{h f}{e v} = \frac{h}{e v} \cdot \frac{2}{\sqrt{r^3}} \left[\frac{g}{r^3} \right] = \frac{6,62606957 \cdot 10^{-34}}{[1,602 \cdot 10^{-19}] \cdot \sqrt{r^3}} = 4,1356586 \cdot 10^{-15} \cdot \frac{2}{\sqrt{r^3}} \leftarrow$

All Particles and Forces End in STPL , Pascal's , P_A , and Desargues's Points , D_A .

AK_C , Creates the , + Force $G^+ = \oplus \rightarrow \emptyset$, and $AK_B = \oplus \leftarrow \emptyset$, Creates the , - Force G^- .

The Why Wave-Birefringence is related to Particles-Chromodynamics :?

The derivation of any two waves is as $W_1 = A \cdot \cos(kx - wt)$, $W_2 = A \cdot \cos(kx - wt + \varphi)$ and by Summation $W_1 + W_2 = A \cdot \cos(kx - wt) + A \cdot \cos(kx - wt + \varphi) \equiv 2A \cdot \cos\left(\frac{\varphi}{2}\right) \cdot \cos[kx - wt + \varphi/2]$

Constructive-Interference happens if the Phase difference is an Even multiple of , φ , or

$\varphi \rightarrow -4\pi , -2\pi , 0 , 2\pi , 4\pi , \dots, 2N\pi$, and or $\rightarrow W_C \equiv W_1 + W_2 = 2A \cdot \cos[kx - wt] \leftarrow$ and

Destructive-Interference happens if the Phase difference is an Odd multiple of φ , or

$\varphi \rightarrow -3\pi , -\pi , 0 , \pi , 3\pi , \dots, (2N-1) \cdot \pi$, and or $\rightarrow W_D \equiv W_1 + W_2 = 0$

From , **Physics of waves** , Birefringence is a Phenomenon in which a ray of Light Passing through a given material experiences two Refractive indices , n_1 , n_2 , The relative magnitude of the Refractive indices is Proportional to the difference of Principal - Strains , and consequence to Stresses as $\rightarrow \delta = d [n_1 - n_2] \dots(1)$, where , **d** , is the thickness of the material , and when a ray of light , of wavelength λ , and Electromagnetic components R_1 , R_2 , passes through an cave , **r** , then Intensity $\rightarrow I = [R_1^2 + R_2^2] \cdot \sin^2\left(\frac{\pi \delta}{\lambda}\right)$, and when $I = 0$, then , $\sin^2\left[\frac{\pi \delta}{\lambda}\right] = 0$. i.e. **when** . $\delta = 0 , \delta = 1 , \delta = 2$, **or generally** $\delta = N$, where $\varepsilon_1 - \varepsilon_2 = \delta / 2r \cdot k = r [n_1 - n_2]$, then the **Relative Retardation** , $\delta = N\lambda = r \cdot \cos \varphi$, where , $\varphi = 0 \approx 90^\circ$ or , $\delta = r , \delta = \pi r / 2 \dots\dots(2)$

Primary-Particles are considered Spherical , so **Merging** happens on Semicircle - clips , $\rightarrow \subset \rightarrow$, and on the Anti -Semicircle the Opposite as $\rightarrow \supset \rightarrow$. In both cases , $\delta = N\lambda = r \cdot \cos[\varphi = 0 - 90^\circ]$.

In case of a **Constructive-Interference** then merging , $\oplus \rightarrow \oplus \equiv \oplus \rightarrow [\subset \oplus] \equiv \oplus \rightarrow (\delta \oplus) \equiv \oplus (\cos \varphi \cdot r \oplus)$

In case of a **Constructive-Interference** merging is , $\ominus \rightarrow \ominus \equiv \ominus \rightarrow [\supset \ominus] \equiv \ominus \rightarrow (\delta \ominus) \equiv \ominus (\cos \varphi \cdot r \ominus)$

In both cases Energy $E = h f \equiv h / T \equiv h c / \lambda$, and $\lambda = \delta / N$ so energy **$E = h N c / \lambda$ (3)**

From (3) is seen that the Number of colors is infinite because $N = 1 \rightarrow \infty$, and so the Color is a form of Strong charge . From Voltage $V_r = F_c \cdot r = \lambda r$, where , $\lambda = c / f$, and is the wavelength .

From Unit-relation $N \lambda = [c / f] = c / \sqrt{\frac{1}{g \cdot r^3}} = c \sqrt{g \cdot r^3} = 2.99819938 \cdot 10^8 \cdot \sqrt{9,8076754} \cdot \sqrt{r^3} =$

$9,3895231 \cdot 10^8 \cdot \sqrt[3]{r^3} \cdot N$, and for $r = 10^{-17} \text{ m}$ (the quarks) , then Wavelength $\lambda = N \cdot 9,3895231 \cdot 10^8 \cdot x$.

$2\sqrt[3]{10^{-51}} = N \cdot 29,692278 \cdot 10^{8-26=-18}$, or $\rightarrow \lambda \equiv N \cdot 29,692278 \cdot 10^{-18} \text{ m}$, so $N = 2 , 4 , 6$, in caves

$r = 10^{-17} \text{ m}$, exists the three Wavelengths $\rightarrow \lambda \equiv 29,692278 \cdot 10^{-18} \text{ m}$

$\rightarrow \lambda \equiv 118,76911 \cdot 10^{-18} \text{ m}$

$\rightarrow \lambda \equiv 178,15366 \cdot 10^{-18} \text{ m}$, for Color-Charges

$r = 10^{-18} \text{ m}$, exists the three Wavelengths $\rightarrow \lambda \equiv 9,3895231 \cdot 10^{-19} \text{ m}$

$\rightarrow \lambda \equiv 18,779046 \cdot 10^{-19} \text{ m}$

$\rightarrow \lambda \equiv 37,558092 \cdot 10^{-19} \text{ m}$, for Color-Charges

$r = 10^{-19} \text{ m}$, exists the three Wavelengths $\rightarrow \lambda \equiv 29,692278 \cdot 10^{-21} \text{ m}$

$$\rightarrow \lambda \equiv 118,76911 \cdot 10^{-21} \text{ m}$$

$$\rightarrow \lambda \equiv 178,15366 \cdot 10^{-21} \text{ m, for Color-Charges}$$

Summarize :

STPL - Circuit, is a **System** consisted of An **Voltage**, $U \equiv U_{A_{KA}}, U_{A_{KB}}, U_{A_{KC}} \equiv \text{Charges } [\oplus \rightarrow \ominus]$, and continuity of Voltage U , ensured through the alternation of Charges, with 3-Phase Differences, angles $K_A A_{K_B}, K_B A_{K_C}, K_C A_{K_A}, A_n, \pm$ **Capacitor**, $C \equiv A - K_A, A - K_B, A - K_C \equiv [\oplus \cup \cup \ominus]$, and An **Inductor L** $\equiv$ Circuits $A - -K_A, A - -K_B, A - -K_C$, with currents, $i_{AKA} = C \frac{dU}{dt} = |AK_A| \left\{ \frac{dQ[AK_A]}{dt} \right\}$, $i_{AKB} = C \frac{dU}{dt} = |AK_B| \left\{ \frac{dQ[AK_B]}{dt} \right\}$, $i_{AKC} = C \frac{dU}{dt} = |AK_C| \left\{ \frac{dQ[AK_C]}{dt} \right\}$, Analogous to {**RLC circuit** of Charges $\oplus, \ominus$ } as a **Three-Phase-Physical-Rotor**, becoming from the Three M-P-Elements, $\oplus, \ominus, \emptyset \equiv [\oplus \leftrightarrow \ominus] \equiv \{+, 0, -\}$ Above Physical-Rotor Creates $\rightarrow$ Strong and Weak Forces, Quarks and Anti-Quarks, Leptons and Anti-Leptons

1.. **Electromotive-Charge-Forces** $\bar{F}_{AKA}$ as current $i = C \frac{dU}{dt} = AK_A \left\{ \frac{dQ[AK_A]}{dt} \right\} = 2|AK_A| \cos\left(\frac{\phi}{2}\right) \cdot \cos\{kx - wt + \phi/2\}$ for $\phi \rightarrow -2\pi, 0, 2\pi, 4\pi \dots 2N\pi$, **Create FROM Constructive-Interference** $i_{KA[C]} = 2|AK_A| \cdot [\cos\left(\frac{\phi}{2}\right) \cdot \cos[kx - wt]]$

(1) **Strong-Forces** in Points **P**, AND from $\rightarrow \{i = \frac{\Delta \bar{V}}{R}\} = i_{KB(A)[C]} = 2|K_B A| \cdot [\cos\left(\frac{\phi}{2}\right) \cdot \cos[kx - wt]]$, (2) **Strong Quarks** in **D** with Charge $\bar{q} = \frac{+2}{3}$, WHILE - FROM, **Destructive-Interference** $\phi \rightarrow -1\pi, 0, 1\pi, 3\pi \dots N\pi$,

(3) **The Anti-Strong Forces** in Points **P**, and (4) **The Weak-Quarks** with Charge $\bar{q} = \frac{-1}{3}$ in Points **D**.

2.. **Electromotive-Charge-Forces** $\bar{F}_{AAE}$ as current $i = C \frac{dU}{dt} = AA_E \left\{ \frac{dQ[AA_E]}{dt} \right\} = 2|AA_E| \cos\left(\frac{\phi}{2}\right) \cdot \cos\{kx - wt + \phi/2\}$ for $\phi \rightarrow -2\pi, 0, 2\pi, 4\pi \dots 2N\pi$, **Create FROM Constructive-Interference**, $i_{KA[C]} = 2|AK_A| \cdot [\cos\left(\frac{\phi}{2}\right) \cdot \cos[kx - wt]]$

(1) **The Weak-Forces** in Points **P**, AND from $\rightarrow i_{KB(A)[C]} = 2|K_B A| \cdot [\cos\left(\frac{\phi}{2}\right) \cdot \cos[kx - wt]]$, **The Strong and The Anti-Strong Leptons** in Points **P**, with Charge $\bar{q} = -1$, WHILE - FROM The **Destructive-Interference** $\phi \rightarrow -1\pi, 0, 1\pi, 3\pi \dots N\pi$, (2) **The Weak and The Anti-Weak Leptons** in Points **P** with Charge $\bar{q} = \pm 0$.

The Table of, Breakages $[\pm s^2 = \pm (wr)^2]$, $[\nabla i = 2(wr)^2]$ and Cosmic-Particles, in STPL Mechanism.

Constructive-Interference	Destructive - Interference
Strong Forces $\rightarrow$ Quarks, Anti-Quarks	Strong Anti-Forces $\rightarrow$ Weak-Quark, Weak-Anti-Quark
A - Phase - $90^\circ \rightarrow Q^+, u, \bar{u}, \rightarrow P, D_A, \bar{q} = 2/3$,	A - Phase $\pm 180^\circ \rightarrow Q^-, d, \bar{d}, \rightarrow P, D_A, \bar{q} = -1/3$,
B - Phase $+180^\circ \rightarrow C^{0-}, c, \bar{c}, \rightarrow P, D_B, \bar{q} = 2/3$,	B - Phase $\pm 180^\circ \rightarrow C^{0+}, s, \bar{s}, \rightarrow P, D_B, \bar{q} = -1/3$,
C - Phase - $90^\circ \rightarrow D^-, t, \bar{t}, \rightarrow P, D_C, \bar{q} = 2/3$,	C - Phase $\pm 180^\circ \rightarrow D^+, b, \bar{b}, \rightarrow P, D_C, \bar{q} = -1/3$,
Constructive-Interference	Destructive - Interference
Forces $\rightarrow$ Strong-Leptons, Anti-Leptons	Anti-Forces $\rightarrow$ Weak-Leptons, Weak-Anti-Leptons
A - Phase $+60^\circ \rightarrow W^+, \mu^-, \tau^- \rightarrow P, \bar{q} = -1$,	A - Phase $+60^\circ \rightarrow W^-, \nu_e, \nu_\mu, \rightarrow P, \bar{q} = -0$,
B - Phase $-120^\circ \rightarrow Z^{0-}, e^+, \tau^+, \rightarrow P, \bar{q} = -1$,	A - Phase $-120^\circ \rightarrow Z^{+0}, \bar{\nu}_\mu, \bar{\nu}_\tau, \rightarrow P, \bar{q} = -0$,
C - Phase $+60^\circ \rightarrow W^-, \mu^+, e^-, \rightarrow P, \bar{q} = -1$,	A - Phase $-120^\circ \rightarrow W^+, \nu_\tau, \bar{\nu}_e, \rightarrow P, \bar{q} = -0$,

Above Elementary Particles and Forces exist in Physical-[STPL]-System, which System Spatially-Equilibrium from All Particles and Anti-Particles, from all Forces and Anti-Forces following Ptolemy's Axial -Tensions **For The System's, Static-Equilibrium**, and from Ceba's The **Torque-Balance - Equilibrium**.

All Particles occupy, $\pm \bar{q}$, Charges for Static and, $\pm \text{Spin } \bar{S}$, for Rotational Equilibrium.

The STPL-Mechanism, **The System**, is Stationary and Motionless in Outer Bounds while in Inner all above motions and Any Possible motion happen in the System-Bounds between all Particles and Forces comprised.

It was referred that two **u-Quark** $\equiv \{\rightarrow D_A I = \frac{+2}{3}\}$, one **d-Charge** $\equiv \{\leftarrow P_A I = \frac{-1}{3}\}$, are effecting linearly and Connected by linear-Coulomb-Forces, as $\rightarrow [u-d-u] \leftarrow$ with the Resultant-Charge $2 \left[\frac{+2}{3} \right] + \frac{-1}{3} = \frac{+3}{3} = +1e \equiv$ The Charge of Electron, e , equal to $C_e = 1,602 \cdot 10^{-19} \text{ C}$, in cave $a = 5,0 \cdot 10^{-17} \text{ m}$, and joint as in (3-f) as,

$$Q^+ = [\rightarrow D_A I] > [\leftarrow P_A I], D^- = [\rightarrow D_A I] < [\leftarrow P_A I], C^{\pm 0} = [\rightarrow D_A I] = [\leftarrow P_A I] \dots \dots \dots (w)$$

It was shown (3-g) that, **Forces between the Opposites Equilibrium-Linearly**, as this is for Two or for Three Particles $\rightarrow [u-\bar{c}] \leftarrow$ or, $\frac{2}{3} e - \frac{2}{3} e = 0, \leftarrow [d-u-d] \rightarrow$ where is the Resultant for the **Neutral-cave** then issues

$q_n = 2.q_d + q_u = -2.\frac{1}{3}e + \frac{2}{3}e = 0.e$, and the Stability of forces is axial as in Proton ,and this because is similar to the Graphic , **Dynamic-Strip-Polygon** , for Trusses-Equilibrium in Statics when this doesn't close .

Electric-Force is the Dominant where Particles are responding to the Constructive				
$[\oplus \rightarrow (+) \leftarrow \oplus]$ or to $[\ominus \rightarrow (+) \leftarrow \ominus]$, and to Destructive $[\oplus \rightarrow (-) \rightarrow \ominus]$ Interference as ,				
Constructive-Interference	$[\oplus \rightarrow \oplus = \oplus \oplus]$	$\equiv$	$CI_{\pm+1}^{++}$	$\equiv$ W^{++} ,
	$[\ominus \rightarrow \ominus = \ominus \ominus]$	$\equiv$	$CI_{\pm0-}^{--}$	$\equiv$ W^{--} ,
	$[\oplus \rightarrow = \oplus]$	$\equiv$	$CI_{\pm+n}^{+-}$	$\equiv$ W^+ .. 3-Types of C I-Forces .
Destructive - Interference	$[\oplus \rightarrow \ominus = 0_+]$	$\equiv$	$DI_{\pm0+}^{+-}$	$\equiv$ Z^{o+} ,
	$[\oplus \rightarrow \ominus = 0]$	$\equiv$	$DI_{\pm0}^{+-}$	$\equiv$ Z^o ,
	$[\oplus \rightarrow \ominus = 0_-]$	$\equiv$	$DI_{\pm0-}^{+-}$	$\equiv$ Z^- .. 3-Types of D I-Forces .

Because Force *can't exist by itself* , there must always be an equal and Opposite Reaction Force acting on the Opposite Position or Direction . **Coulomb-Force** acting between two Particles is

$$\mathbf{F}_c = C \frac{q_1.q_2}{r^2} , \text{ while the Voltage is } \mathbf{V}_r = C \frac{q_1.q_2}{r} \text{ of cave , } r , \text{ and issues } \rightarrow \mathbf{V}_r = \mathbf{F}_c \cdot \mathbf{r} \leftarrow ..(v)$$

i.e. when Two Particles are in a cave , **r** , then exists an Interaction between the two Particles .

The $\oplus$ Charged-Particle Produces an Electric-field $\vec{E}$, which exerts a force $\vec{F}$ on the other charged Particle creating the-Constructive or the Destructive Interference , in an Homogenous and Harmonic vibration Voltage , as is the Dynamic Matrix $[\lambda M+K] X=0$ where $\bar{\lambda} = 1/w^2 = 1/\lambda$.

The moving Charged Particle , $\oplus$ or $\ominus$, Produces a Magnetic-field $\vec{B}$,which exerts a Force $\vec{F}$ on the other moving charge . The Force $\vec{F}$ of these charges is always Perpendicular to the Direction of their Velocity Vector , therefore the **Velocity-Magnitude** does not change , and only the **Direction** of the Velocity-Vector changes . With this way is created the **Electromagnetic-Wave in cave , r** , with Wavelength , $\lambda = 2r$,on Two or more Possible nodes .This formation is that of the Material Point , i.e. **it is a Standing-Wave** , with the Two $\pm$ Charges at the Two-Opposite-Nodes .

The Permutations – **Per - Two** for the Six **Leptons** is 15 , and the same 15 for the Six Anti-Leptons.,

$$\mathbf{Ple}_2^6 \rightarrow e^- \mu^+ , e^- \tau^+ , e^- \nu_e , e^- \nu_\mu , e^- \nu_\tau - \mu^+ \tau^+ , \mu^+ \nu_e , \mu^+ \nu_\mu , \mu^+ \nu_\tau , \text{ Leptons}$$

$$\tau^+ \nu_e , \tau^+ \nu_\mu , \tau^+ \nu_\tau , \nu_e \nu_\mu , \nu_e \nu_\tau , \nu_\mu \nu_\tau = \mathbf{15-P.leptons}$$

$$\mathbf{P\bar{le}}_2^6 \rightarrow e^+ \bar{\mu} , e^+ \bar{\tau} , e^+ \nu_e , e^+ \nu_\mu , e^+ \nu_\tau - \bar{\mu} \tau^- , \bar{\mu} \bar{\nu}_e , \bar{\mu} \bar{\nu}_\mu , \bar{\mu} \bar{\nu}_\tau , \text{ Anti-Leptons}$$

$$\bar{\tau} \bar{\nu}_e , \bar{\tau} \bar{\nu}_\mu , \bar{\tau} \bar{\nu}_\tau , \bar{\nu}_e \bar{\nu}_\mu , \bar{\nu}_e \bar{\nu}_\tau , \bar{\nu}_\mu \bar{\nu}_\tau = \mathbf{15-P.A.leptons}$$

The Permutations-**Per-Two** of the Six **Quarks** is 15 ,and the same 15 for the Six Anti-Quarks.

$$\mathbf{Pqu}_2^6 \rightarrow u c , u t , u d , u s , u b - c t , c d , c s , c b - t d , t s , t b - d s , d b , s b = \mathbf{15-P} , \text{ Quarks.}$$

$$\mathbf{P\bar{qu}}_2^6 \rightarrow \bar{u} \bar{c} , \bar{u} \bar{t} , \bar{u} \bar{d} , \bar{u} \bar{s} , \bar{u} \bar{b} - \bar{c} \bar{t} , \bar{c} \bar{d} , \bar{c} \bar{s} , \bar{c} \bar{b} - \bar{t} \bar{d} , \bar{t} \bar{s} , \bar{t} \bar{b} - \bar{d} \bar{s} , \bar{d} \bar{b} , \bar{s} \bar{b} = \mathbf{15-P} , \text{ Anti-Quarks.}$$

The Permutations-Per-Three , Not the same , of the Six Quarks is **20-P**

while with repetition is $PR_3^6 = [7^3+1] / 2 = \mathbf{172}$ as below .

$$\mathbf{P}_3^6 \rightarrow u c t , u c d , u c c , u c b - u t d , u t c , u t b - u d s , u d b , u s b -$$

$$c t d , c t c , c t b , c d c , c d b , c s b - t d s , t d b , t s b , d s b = \mathbf{20-P}$$

$$\mathbf{PR}_3^6 \rightarrow u u u , u u d , u d d , d d d , u d c , u u c , u d c , d d s , u c c , d s s , s s s , . . . ,$$

$\mathbf{P}_2^6 , \mathbf{P}_3^6 , \mathbf{Pqu}_2^6 , \mathbf{P\bar{qu}}_2^6 , \mathbf{P}_3^6 , \mathbf{PR}_3^6$, and generally $\mathbf{P}_n^6$ are the **Basic-Permutations of the Primary-Particles** , while others are Composite , for Interactions and Decays .

Remarks :

1... Opposite[The **Space** $\rightarrow s^2 = v^2 \equiv \oplus$, **Anti-Space** $\rightarrow 2s^2 = 2v^2 \equiv \emptyset$, **Sub-Space** $\rightarrow -s^2 = -v^2 \equiv \ominus$] , **Interact** in STPL-Mechanism , And Form The – **Quantum - Chromo-Dynamics Forces** , $\mathbf{Q}^\pm$, $\mathbf{C}^\pm$, $\mathbf{D}^\mp$, in order to

form Composite , $[\oplus \text{ or } \ominus]$ **Charges again** , as are the Elementary-Particles , **Leptons - Quarks** and

Weak - Forces . Because *Composite* demand Forces to hold them bind , and because Chromodynamics and

Weak-Forces are *Electromagnetic-Forces* , because become from the moving Charges in STPL-Circuit , or

from an PHASE-Mechanism , **THEREFORE** → **Strong and Weal-Forces are Electromagnetic-Forces** ←

2... **Elementary-Particles** , Interact in System , in order that to form **More-Composite** , $[\oplus]$ or $[\ominus]$ Particles

AGAIN , as these are the Composite-Particles , **Proton – Neutron and Caves** , with Charges and Spins for Stability , AND Elementary Structures of → **Atoms , Molecules , Crystals ,Solids** , and continued to → ∞ .

3...**Question ??** WHERE , HOW and WHEN , are created , *The-Strong – Chromodynamics - Forces* :

a.. **It was Proved That , STPL – PHYSICAL - CIRCUIT** , $\{\text{STPL-C}\}$, is **An- Energy-System** ,consisted of an Voltage , as $U \equiv [\oplus \rightarrow \ominus]$, an Capacitor , $C \equiv [\oplus \cup \ominus]$, and Three Inductors , $L_1 \equiv AK_A - A_E K_A$, $L_2 \equiv BK_B - B_E K_B$, $L_3 \equiv CK_C - C_E K_C$, on Common-circle $[O, OA]$, in which Space and Anti-Space Equilibrium Axially , **Ptolemy's** , and Rotationally following **Ceba's Theorem** in Euclidean-Geometry .

b..**The Analogous ,Parallel -RLC Electric-circuit** of Charges $\{\oplus, \ominus\}$ Creates a *Resonant Frequency* which is Stored in Magnetic Field $\bar{B}_F$, while The *Charged Electrons* are stored as Energy in Static-Electric-Field . **Oscillating Mass-System** on $r = u$, velocity $\bar{v} = [\frac{F \cdot \Phi}{A}] = F \cdot [\frac{\Phi}{A}]$, Stress relation $\sigma = \frac{F}{A} = \frac{2\pi r f}{\Phi} = \frac{w r}{\Phi} = \frac{v}{\Phi} = \frac{G}{\Phi^3}$, Unit-Stress-Gravity g is , $k = E = \frac{T^2}{a^3} = g = \frac{1}{r^2 \cdot a^3}$ and for $a = r$, then $g r^3 \cdot f_p^2 = 1$. For **Duality-Photon** issues $\{\bar{c} \cdot [\bar{f}_n] + \bar{c} \cdot f_n\} \equiv \text{Particle} + \text{Wave}$, where $\bar{c} \cdot [\bar{f}_n] = k \cdot \pi r^3 = \bar{F}_E \times \bar{F}_M \times \lambda$, and Equal-Intensities E_E , $E_M \perp E_E$.

and so , $f_n = v / 2\pi r = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\sigma \cdot \Phi}{2\pi \cdot r_n}$, or $\bar{v} = \sigma \cdot \Phi \dots (a)$, and $\pm \text{Spin} \rightarrow S_G = \bar{B} = J w = \pi^2 \cdot r^4 \cdot f_n = g$.

c.. **The Vector Angular Momentum Quantity** is , $\bar{B}$, The *Vector Angular – Velocity- Quantity* is , $\bar{w}$, which *Three monads with Energy = L are related as* $\bar{B} \cdot \bar{w} = 2L = J \cdot w^2 = J [\frac{c}{r_m}]^2 = J \cdot [2\pi f]^2 = J \cdot [2\pi \frac{\sigma \Phi}{2\pi r}]^2 = J \cdot [\frac{\sigma \Phi}{r}]^2$, and Propagating- Photon $\bar{v} = \lambda_F \cdot f_F = \bar{c} \cdot [\frac{\sigma}{2\pi r} + \frac{\sigma \Phi}{2\pi r}]$, Its **Natural frequency** → $w_{Nf} = 2\pi \cdot f = 2\pi [\frac{B}{\pi^2 r^4}]$ and Its Total – Energy in λ is $k = \bar{c} \cdot [\bar{f}_n] + \bar{c} \cdot f_n \equiv \bar{v} \cdot \{ [\bar{f}_n] + f_n \} \equiv |\frac{v}{\pi^2 r^4}| \cdot [\bar{B}_n] + |\bar{c}| f_n \equiv \text{Particle} + \text{Wave}$, as

The [Magnetic-Fields] $\equiv$ [Energy-Baskets] , And Wave as **The Wave Energy for Energy Propagation** .

d.. Because of Strength-field $\bar{B}_F = [\frac{2\pi \cdot m \cdot T}{q_T}] \cdot f \equiv \bar{B} = \frac{\pi r^3 \Phi \cdot \sigma}{4} \rightarrow \text{Then Wave} \equiv \{ [\epsilon E^2 + \mu B^2] = 2 \cdot \lambda c \cdot \sin [\frac{2\pi c}{\lambda}] \}$,

e.. **In** $\{\text{STPL-C}\}$, $\oplus$ -Breakage $s^2 = +|\bar{v}|^2 = |\bar{w} \times r|^2$ being at Point **A** → **Attacks Breakage Charge** , - $s^2 = \ominus$, at Point **K_A** with an **Impressed-Force** $Q_{AK_A} = Z_{AK_A} \frac{d}{r} \equiv |\bar{e}| \times \frac{3}{3} = q^+ \equiv \bar{Q}_{\pm} = |\frac{\oplus \times \ominus}{r^2}|$, with $\bar{c}$ velocity and forms The Quantum **Chromodynamics - Force** $\{Q^+\}$ in Conductor $[\frac{d=AK_A}{AK_A}] = \frac{3}{3}$, as $\frac{3|\bar{e}|}{3}$, and launched into STPL - Pascal-Point P_A . Breakages , $\oplus$, $\ominus$, maybe **Any-Opposites** in **Any-Space-Level** , as in Electric-circuits where Electron-negative-Charge is on a Capacitor of Plate-Distance , d , And **IN-Short** ,

f..In $\{\text{STPL -C}\}$, $\oplus A \Rightarrow \ominus K_A \equiv \overrightarrow{AK_A} \equiv q^+ \equiv \bar{Q}_{\pm} = |\frac{c \cdot \bar{s}}{r^2}| [\Rightarrow AK_A] \equiv Z_{AK_A} \frac{d}{r} \equiv |\bar{e}| \times \frac{3}{3} \equiv -[\overrightarrow{AK_A}] \equiv q^-$
 $\equiv$ The Quantum- Strong-Chromodynamics - Forces Q^+ , Q^- .

I... AN NEW INTERACTION – METHOD based on – 2f -3f –Page → 40-46

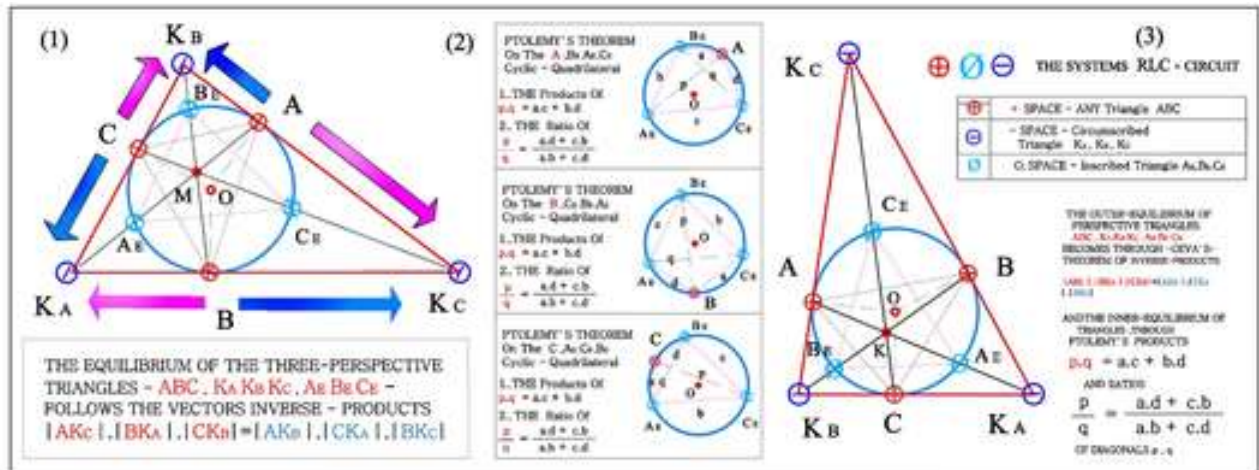


Figure - 30- : The Stability of $\rightarrow \{ \oplus - \text{Space } [A B C] \}$, $\{ \ominus - \text{Anti-Space } [K_A K_B K_C] \}$, and of Sub-Space $\{ \oplus \leftrightarrow \ominus \} \equiv ds \equiv [\oplus \leftarrow ds \rightarrow \ominus]$ -or- The Neutral-Space $[A_E, B_E, C_E] \} \leftarrow$

In-(1) The motions occurs from Positive to Negative $as, \oplus - d - \ominus \equiv \rightarrow \overline{AK_A}$, in the In-between Displacement . **Inner - Connectors** $[AA_E, BB_E, CC_E]$, $[A_E B_E, A_E C_E, B_E C_E]$, follow the **Ptolemy's-Theorem** and the **Outer -Connectors** $[AK_B, CK_A, BK_C] = [AK_C, BK_A, CK_B]$, follow the **Ceba's-Theorem** for Equilibrium .

In-(2) Equilibrium of the Three-Spaces is succeeded on Cyclic-Quadrilaterals $(AB_E A_E C_E), (BC_E B_E A_E), (CA_E C_E B_E)$ **Linearly** through *the Products* of Diagonal-connectors $as, [AA_E].[B_E C_E] = [AC_E].[A_E B_E] + [AB_E].[A_E C_E]$, $[BB_E].[C_E A_E] = [BA_E].[B_E C_E] + [BC_E].[B_E A_E]$, $[CC_E].[A_E B_E] = [CA_E].[B_E C_E] + [CB_E].[C_E A_E]$ and , **Rotationally** through *the Ratio* of Diagonals, $|\frac{AK_B}{AK_C}| \times |\frac{BK_C}{BK_A}| \times |\frac{CK_A}{CK_B}| = 1$ or $\pm$ **Rotational-Equilibrium** $[AK_B].[CK_A].[BK_C] = [AK_C].[BK_A].[CK_B]$, of all above Opposites $\rightarrow$ **Tangential-Electromotive-Forces** .

In-(3) The **Inner-Connectors** Equilibrium linearly while the **Outer-Rotational-Conductors** *Equilibrium* from the $\oplus$ -Space $[A B C] \}$, $\{ \ominus$ -Anti-Space $[K_A K_B K_C] \}$ where create the Strongest- Tangential-Forces for $\pm$ Spin . $\{ \{ \text{WHEN the above Oscillating-Inner-System } W_R, \text{ with all The-Diagonal Linear Electromotive Coulomb forces } F_C, \text{ Due to the } \oplus \text{ Charges effecting on the } \ominus \text{ Charges, IS RESONATED with That of Angular-Momentum or } \equiv \text{SPIN } \bar{S}, \text{ becoming from The-Tangential-Electromotive-Forces, and THEN, Coulomb- ELECTROMOTIVE-FORCES Become Equal to Centrifugal-Inner-Forces} \} \}$
 $\rightarrow$ The **CENTRIFUGAL - FORCE**, which is created from the Rotated System, *Tangential-Phase-Forces*, **PUSHES** the Inner **COULOMB-FORCES** created from Opposite $\pm$ charges, **OUTWARDS-SYSTEM**. The **Centrifugal-Coulomb-Forces**, created after motion, **ARE The Elementary-Particles** and The **Equilibrium-Tangential-Forces** IS the **Spin $\bar{S}$** $\leftarrow$

From **Lorentz-Force**, $F = \bar{q} \bar{v} \times \bar{B}_F$, where, $\bar{q} \equiv$ Charge, $\bar{v} \equiv$ The velocity of Charge, $\bar{B}_F \equiv$ The Strength of Magnetic field then Centrifugal Force, $F_{CF} = m.w^2_R.r$, and from Cave-Spin, $\bar{S} = r m v$, then mass $m = (\frac{S}{r.v})$.

Equating equations then, $F \equiv F_{CF} \equiv \bar{q} \bar{v} \times \bar{B}_F$, and $Q_{\pm} = m.w^2_R.r = (\frac{S}{r.v}).w^2.r = \frac{S.w^2}{v} = \frac{S.v^2}{r^2.v} \equiv \frac{v.\bar{S}}{r^2} \dots (EMF)$

i.e. **Electromotive-Forces**, $F = \bar{q} \bar{v} \times \bar{B}_F = Q_{\pm} = \frac{v.\bar{S}}{r^2} \equiv |\frac{c.\bar{S}}{r^2}|$, are **The Elementary-Particles** $\{ F, L, Q \}$.

Remarks :

1... Electromotive-Force in the min-cave $r = 1,7724538.10^{-3}$ m. is Electron-Force-Charge $\bar{q}_e$ as

$$Q_{\pm} = |\frac{c.\bar{S}}{r^2}| = \frac{[2,998.10^8].[1,0546.10^{-34}].s}{(1,7724538.10^{-3})^2} = 1,6022.10^{-19} \text{ eV, which is the Electron-Force-Charge, or as}$$

$$\bar{q}_{\text{Electron}} = \frac{G}{c.\sqrt{2}} = \frac{6,6736923.10^{-11}}{1,41429.2,9979346.10^8} = 1,574.10^{-19} \text{ C.}$$

2... Electromotive-Force in the min-cave $e^{-15,572707} = r = 1,7252787.10^{-7}$ m. is the Gravitational-Force G , as

$$Q_{\pm} = |\frac{c.\bar{S}}{r^2}| = \frac{[2,998.10^8].[6,62606957.10^{-34}]}{(1,7252787.10^{-7})^2} = 6,673692.10^{-11}, \text{ which is the G - Physical-Force-Charge.}$$

The Elementary-Physical-System of Forces-Charge-Bonding , Through an , 2 , 3 - Phase Current :**The Steps of - Elementary-Particles - Origination :**

$\oplus$ Space Attacks the $\rightarrow \ominus \equiv$ Anti-Space as the $\rightarrow +$ **Magnet , THE , – Magnet .**

Because in Magnets there is Not-Any-Escape-Door Action of $\oplus$ to $\ominus$ is Permanent , in contradiction to the Spaces occupying Sub-Spaces . As soon as , $\oplus$ Space Attacks $\ominus \equiv$ Anti-Space , then ,

STEP-1 . $\oplus \equiv$ Space , $\ominus \equiv$ Anti-Space , $\emptyset \equiv$ Sub-Space or Neutral-Space , at Equilibrium Conditions F-26-27

1-State $\equiv$ Phase $\equiv$ Positions, **Charges** $\oplus \equiv A, B, C$ - **Charges** $\ominus \equiv K_A K_B K_C$ - **Positions** $\emptyset \equiv A_E, B_E, C_E$,

MAGNET $\Rightarrow [\oplus \rightarrow \ominus]$, On Conductors $\overrightarrow{AK_A}, \overrightarrow{BK_B}, \overrightarrow{CK_C}$, Exert Electromotive-Forces $Q^{\pm 0}$, and Launched Into the Low-Voltage Point P_A of STPL , Forming Elementary-Particle $\rightarrow$ Strong-Chroma-Forces **Q^+, C^{0-}, D^-**

1... $\oplus A \Rightarrow \ominus K_A \equiv \overrightarrow{AK_A} \equiv q^+ = - \gg P_A$,creating $[P_{+A1}] \rightarrow$ Strong-Chromodynamics-Force **Q^+** $\leftarrow$

2... $\oplus B \Rightarrow \ominus K_B \equiv \overrightarrow{BK_B} \equiv q^{0-} = - \gg P_B$,creating $[P_{-B1}] \rightarrow$ Weak-Chromodynamics-Force **C^{0-}** $\leftarrow$

3... $\oplus C \Rightarrow \ominus K_C \equiv \overrightarrow{CK_C} \equiv q^- = - \gg P_C$,creating $[P_{-C1}] \rightarrow$ Strong-Chromodynamics-Force **D^-** $\leftarrow$

MAGNET $\Rightarrow [\oplus \rightarrow \ominus]$, On Conductors $\overrightarrow{K_A A}, \overrightarrow{K_B B}, \overrightarrow{K_C C}$, Exert the Electromotive- Forces $Q^{\mp 0}$, which Launched Into Low-Voltage Points P_A, P_B, P_C , of STPL, Forming $\rightarrow$ Anti-Strong-Chroma-Forces , **Q^-, C^{0+}, D^+**

1... $\oplus K_A \Rightarrow \ominus A \equiv \overrightarrow{K_A A} \equiv q_- = - \gg P_A$,creating $[P_{-KAA}] \rightarrow$ Anti- Chromodynamics- Force **Q^-** $\leftarrow$

2... $\oplus K_B \Rightarrow \ominus B \equiv \overrightarrow{K_B B} \equiv q_+ = - \gg P_B$,creating $[P_{+KBB}] \rightarrow$ Anti -Chromodynamics-Force **C^{0+}** $\leftarrow$

3... $\oplus K_C \Rightarrow \ominus C \equiv \overrightarrow{K_C C} \equiv q_+ = - \gg P_C$,creating $[P_{+KCC}] \rightarrow$ Anti -Chromodynamics-Force **D^+** $\leftarrow$

MAGNET $\Rightarrow [\oplus \rightarrow \ominus]$, On Conductors , $\overrightarrow{AK_B}, \overrightarrow{AK_C}$, Exert Electromotive-Forces $Q_{\pm}$, which are

Launched Into Low-Voltage Points D_A, D_A , of STPL , Forming charge $q = \frac{2}{3}$, Strong - Quarks , **$\bar{u}, u$** ,

1... $\oplus A \Rightarrow \ominus K_B \equiv \overrightarrow{AK_B} \equiv q_- = - \gg D_A$,creating $[D_{-AKB}] \rightarrow$ Strong-Anti-Up – Quark **$\bar{u}$** $\leftarrow$

2... $\oplus A \Rightarrow \ominus K_C \equiv \overrightarrow{AK_C} \equiv q_+ = - \gg D_A$,creating $[D_{+AKC}] \rightarrow$ Strong - Up – Quark **u** $\leftarrow$

MAGNET $\Rightarrow [\oplus \rightarrow \ominus]$, On Conductors , $\overrightarrow{BK_C}, \overrightarrow{BK_A}$, Exert Electromotive-Forces $Q_{\pm}$, which are

Launched Into Low-Voltage Points D_B, D_B , of STPL , Forming charge $q = \frac{2}{3}$, Strong - Quarks , **$\bar{c}, c$** ,

1... $\oplus B \Rightarrow \ominus K_C \equiv \overrightarrow{BK_B} \equiv q_- = - \gg D_B$,creating $[D_{-BKC}] \rightarrow$ Strong-Anti-Char-Quark **$\bar{c}$** $\leftarrow$

2... $\oplus B \Rightarrow \ominus K_A \equiv \overrightarrow{BK_C} \equiv q_+ = - \gg D_B$,creating $[D_{+BKA}] \rightarrow$ Strong - Charm – Quark **c** $\leftarrow$

MAGNET $\Rightarrow [\oplus \rightarrow \ominus]$, On Conductors , $\overrightarrow{CK_A}, \overrightarrow{CK_B}$, Exert Electromotive-Forces $Q_{\pm}$, which are

Launched Into Low-Voltage Points D_C, D_C , of STPL , Forming charge $q = \frac{2}{3}$, Strong – Quarks , **$t, \bar{t}$** ,

1... $\oplus C \Rightarrow \ominus K_A \equiv \overrightarrow{CK_A} \equiv q_+ = - \gg D_C$,creating $[D_{+CKA}] \rightarrow$ Strong – Top - Quark **t** $\leftarrow$

2... $\oplus C \Rightarrow \ominus K_B \equiv \overrightarrow{CK_C} \equiv q_- = - \gg D_C$,creating $[D_{+BKA}] \rightarrow$ Strong-Anti-Top- Quark **$\bar{t}$** $\leftarrow$

MAGNET $\Rightarrow [\oplus \rightarrow \ominus]$, On Conductors , $\overrightarrow{K_A B}, \overrightarrow{K_A C}$, Exert Electromotive-Forces $Q_{\pm}$, which are

Launched Into Low-Voltage Points D_B, D_C , of STPL , Forming charge $q = \frac{-1}{3}$, Weak-Anti-Quarks , **$\bar{s}, \bar{b}$** ,

1... $\oplus K_A \Rightarrow \ominus B \equiv \overrightarrow{K_A B} \equiv q_- = - \gg D_B$,creating $[D_{-KAB}] \rightarrow$ Anti-Strange – Quark **$\bar{s}$** $\leftarrow$

2... $\oplus K_A \Rightarrow \ominus C \equiv \overrightarrow{K_B C} \equiv q_- = - \gg D_C$,creating $[D_{-KAC}] \rightarrow$ Anti-Bottom – Quark **$\bar{b}$** $\leftarrow$

MAGNET $\Rightarrow [\oplus \rightarrow \ominus]$, On Conductors , $\overrightarrow{K_B C}, \overrightarrow{K_B A}$, Exert Electromotive-Forces $Q_{\pm}$, which are

Launched Into Low-Voltage Points D_C, D_A , of STPL , Forming charge $q = \frac{-1}{3}$, Weak-Quarks , **b, d** ,

1... $\oplus K_B \Rightarrow \ominus C \equiv \overrightarrow{K_B C} \equiv q_+ = - \gg D_C$,creating $[D_{+KBC}] \rightarrow$ Weak-Bottom-Quark **b** $\leftarrow$

2... $\oplus K_B \Rightarrow \ominus A \equiv \overrightarrow{K_B A} \equiv q_+ = - \gg D_A$,creating $[D_{+KBA}] \rightarrow$ Weak-Down-Quark **d** $\leftarrow$

MAGNET $\Rightarrow [\oplus \rightarrow \ominus]$, On Conductors , $\overrightarrow{K_C A}, \overrightarrow{K_C B}$, Exert Electromotive-Forces $Q_{\pm}$, which are

Launched Into Low-Voltage Points D_A, D_B , of STPL , Forming charge $q = \frac{-1}{3}$, Weak-Quarks , **$\bar{d}, s$** ,

1... $\oplus K_C \Rightarrow \ominus A \equiv \overrightarrow{K_C A} \equiv q_- = - \gg D_A$,creating $[D_{-KCA}] \rightarrow$ Anti - Down – Quark **$\bar{d}$** $\leftarrow$

2... $\oplus K_C \Rightarrow \ominus B \equiv \overrightarrow{K_C B} \equiv q_+ = - \gg D_B$,creating $[D_{+KCB}] \rightarrow$ Weak-Strange-Quarks **s** $\leftarrow$

STEP-2 . $\oplus \equiv$ Space , $\ominus \equiv$ Anti-Space , $\emptyset \equiv$ Sub-Space or Neutral-Space , at Equilibrium Conditions F-28-29

MAGNET $\Rightarrow [\oplus \rightarrow \ominus]$, On Conductors, $\overrightarrow{AA_E}, \overrightarrow{AB_E}, \overrightarrow{AC_E}$, Exert Electromotive-Forces $Q_{\pm}, q = -1$ which are Launched Into Low-Voltage Points P_A, P_C, P_B , of STPL, Forming Elementary-Particles W^+, μ, τ ,

1... $\oplus A \Rightarrow \ominus A_E \equiv \overrightarrow{AA_E} \equiv q_+ = - \Rightarrow P_A$, creating $[P_{+AAE}] \rightarrow$ Weak-Lepton-Force $W^+ \leftarrow$

2... $\oplus A \Rightarrow \ominus B_E \equiv \overrightarrow{AB_E} \equiv q_+ = - \Rightarrow P_C$, creating $[P_{+ABE}] \rightarrow$ Strong - Tau-Lepton $\mu \leftarrow$

3... $\oplus A \Rightarrow \ominus C_E \equiv \overrightarrow{AC_E} \equiv q_+ = - \Rightarrow P_B$, creating $[P_{+ACE}] \rightarrow$ Strong - Muon-Lepton $\tau \leftarrow$

MAGNET $\Rightarrow [\oplus \rightarrow \ominus]$, On Conductors, $\overrightarrow{BB_E}, \overrightarrow{BC_E}, \overrightarrow{BA_E}$, Exert Electromotive-Forces $Q_{\pm}, q = -1$ which are Launched Into Low-Voltage Points P_B, P_A, P_C , of STPL, Forming Elementary-Particles $Z^0, \bar{\tau}, e^-$

1... $\oplus B \Rightarrow \ominus B_E \equiv \overrightarrow{AB_E} \equiv q_+ = - \Rightarrow P_B$, creating $[P_{+BBE}] \rightarrow$ Weak-Lepton-Force $Z^0 \leftarrow$

2... $\oplus B \Rightarrow \ominus C_E \equiv \overrightarrow{BC_E} \equiv q_- = - \Rightarrow P_A$, creating $[P_{+BCE}] \rightarrow$ Strong - Electron $e^- \leftarrow$

3... $\oplus B \Rightarrow \ominus A_E \equiv \overrightarrow{BA_E} \equiv q_+ = - \Rightarrow P_C$, creating $[P_{+BAE}] \rightarrow$ Strong --Anti-Tau-Lepton $\bar{\tau} \leftarrow$

MAGNET $\Rightarrow [\oplus \rightarrow \ominus]$, On Conductors, $\overrightarrow{CC_E}, \overrightarrow{CA_E}, \overrightarrow{CB_E}$, Exert Electromotive-Forces $Q_{\pm}, q = -1$ which are Launched Into Low-Voltage Points P_C, P_B, P_A , of STPL, Forming Elementary-Particles $W^-, e^+, \bar{\mu}$,

1... $\oplus C \Rightarrow \ominus C_E \equiv \overrightarrow{CC_E} \equiv q_- = - \Rightarrow P_C$, creating $[P_{-CCE}] \rightarrow$ Weak-Lepton-Force $W^- \leftarrow$

2... $\oplus C \Rightarrow \ominus A_E \equiv \overrightarrow{CC_E} \equiv q_+ = - \Rightarrow P_B$, creating $[P_{+CAE}] \rightarrow$ Strong -Positron-Lepton $e^+ \leftarrow$

3... $\oplus C \Rightarrow \ominus B_E \equiv \overrightarrow{CB_E} \equiv q_- = - \Rightarrow P_A$, creating $[P_{+CBE}] \rightarrow$ Strong -Anti-Muon-Lepton $\bar{\mu} \leftarrow$

MAGNET $\Rightarrow [\oplus \rightarrow \ominus]$, On Conductors, $\overrightarrow{A_E A}, \overrightarrow{A_E B}, \overrightarrow{A_E C}$, Exert Electromotive-Forces $Q_{\pm}, q = -0$ which is Launched Into Low-Voltage Points P_A, P_C, P_B , of STPL, Forming Elementary- Particles $W^-, \nu_{\tau}, \bar{\nu}_{\mu}$

1... $\oplus A_E \Rightarrow \ominus A \equiv \overrightarrow{A_E A} \equiv Q_- = - \Rightarrow P_A$, creating $[P_{-AEA}] \rightarrow$ Weak-Lepton-Force $W^- \leftarrow$

2... $\oplus A_E \Rightarrow \ominus B \equiv \overrightarrow{A_E B} \equiv q_+ = - \Rightarrow P_B$, creating $[P_{-AEC}] \rightarrow$ Tau-Neutrino $\nu_{\tau} \leftarrow$

3... $\oplus A_E \Rightarrow \ominus C \equiv \overrightarrow{A_E C} \equiv q_+ = - \Rightarrow P_C$, creating $[P_{-AEC}] \rightarrow$ Anti-Muon-Neutrino $\bar{\nu}_{\mu} \leftarrow$

MAGNET $\Rightarrow [\oplus \rightarrow \ominus]$, On Conductors, $\overrightarrow{B_E B}, \overrightarrow{B_E C}, \overrightarrow{B_E A}$, Exert Electromotive-Forces $Q_{\pm}, q = -0$ which is Launched Into Low-Voltage Points P_B, P_A, P_C , of STPL, Forming Elementary- Particles $Z^0, \nu_{\mu}, \bar{\nu}_e$

1... $\oplus B_E \Rightarrow \ominus B \equiv \overrightarrow{B_E B} \equiv q_+ = - \Rightarrow P_A$, creating $[P_{-BEB}] \rightarrow$ Weak-Lepton-Force $Z^0 \leftarrow$

2... $\oplus B_E \Rightarrow \ominus A \equiv \overrightarrow{B_E A} \equiv q_- = - \Rightarrow P_B$, creating $[P_{-BEA}] \rightarrow$ Anti-Electron-Neutrino $\bar{\nu}_e \leftarrow$

3... $\oplus B_E \Rightarrow \ominus C \equiv \overrightarrow{B_E C} \equiv q_+ = - \Rightarrow P_C$, creating $[P_{-BEC}] \rightarrow$ Muon - Neutrino $\nu_{\mu} \leftarrow$

MAGNET $\Rightarrow [\oplus \rightarrow \ominus]$, On Conductors, $\overrightarrow{C_E C}, \overrightarrow{C_E A}, \overrightarrow{C_E B}$, Exert Electromotive-Forces $Q_{\pm}, q = -0$ which is Launched Into Low-Voltage Points P_C, P_B, P_A , of STPL, Forming Elementary- Particles $W^+, \nu_e, \bar{\nu}_{\tau}$

1... $\oplus C_E \Rightarrow \ominus C \equiv \overrightarrow{C_E C} \equiv q_+ = - \Rightarrow P_C$, creating $[P_{-AEA}] \rightarrow$ Weak-Lepton-Force $W^- \leftarrow$

2... $\oplus C_E \Rightarrow \ominus B \equiv \overrightarrow{C_E B} \equiv q_- = - \Rightarrow P_B$, creating $[P_{-AEC}] \rightarrow$ Anti-Tau-Neutrino $\bar{\nu}_{\tau} \leftarrow$

3... $\oplus C_E \Rightarrow \ominus A \equiv \overrightarrow{C_E A} \equiv q_+ = - \Rightarrow P_A$, creating $[P_{-AEC}] \rightarrow$ Electron - Neutrino $\nu_e \leftarrow$

STEP-3. The States follow the Cyclic Positions **Charges** $\oplus$ at $\rightarrow A, B, C \rightarrow A_E, B_E, C_E \rightarrow K_A K_B K_C \leftarrow$
Following Permutations, of 3-Positions per 2-Charges $\rightarrow P_2^3 = 6$, and $C_2^3 = 3$ Combinations

1-State $\equiv$ Phase $\equiv \oplus \rightarrow \ominus$, $\oplus$ **Charges** $\equiv A, B, C - \ominus$ **Charges** $\equiv K_A K_B K_C - \oslash$ **Positions** $\equiv A_E, B_E, C_E$

2-State $\equiv$ Phase $\equiv \oplus \rightarrow \ominus$, $\oplus$ **Charges** $\equiv K_A, K_B, K_C - \ominus$ **Charges** $\equiv A, B, C - \oslash$ **Positions** $\equiv A_E, B_E, C_E$

The Phase is $\rightarrow w = \text{angle of } 360^\circ = 2\pi / \text{Period } T$. The change of Phase in, 1-2, is $0^\circ - 180^\circ = 2\pi$

3-State $\equiv$ Phase $\equiv \oplus \rightarrow \ominus$, $\oplus$ **Charges** $\equiv A, B, C - \ominus$ **Charges** $\equiv A_E, B_E, C_E - \oslash$ **Positions** $\equiv K_A, K_B, K_C$

The change of Phase in, 3-3+, is $0^\circ - 45^\circ = \pi/2$, and The change of Phase in, +3-0, is $45^\circ - 0^\circ = -\pi/2$,

4-State $\equiv$ Phase $\equiv \oplus \rightarrow \ominus$, $\oplus$ **Charges** $\equiv A_E, B_E, C_E - \ominus$ **Charges** $\equiv A, B, C - \oslash$ **Positions** $\equiv K_A K_B K_C$

The change of Phase in, 4-4+, is $-0^\circ + 45^\circ = -\pi/2$, and The change of Phase in, $-\pi/2, +0$, is $-0^\circ, +45^\circ = +\pi/2$

5-State $\equiv$ Phase $\equiv \oplus \rightarrow \ominus$, $\oplus$ **Charges** $\equiv A, B, C - \ominus$ **Charges** $\equiv K_A K_B K_C - \oslash$ **Positions** $\equiv A_E, B_E, C_E$

The change of Phase in , 4-5+ , is $+45^\circ$, $-0^\circ = -\pi/2$, and The change of Phase in , -4-0 , is -45° , $+0^\circ = 0^\circ$

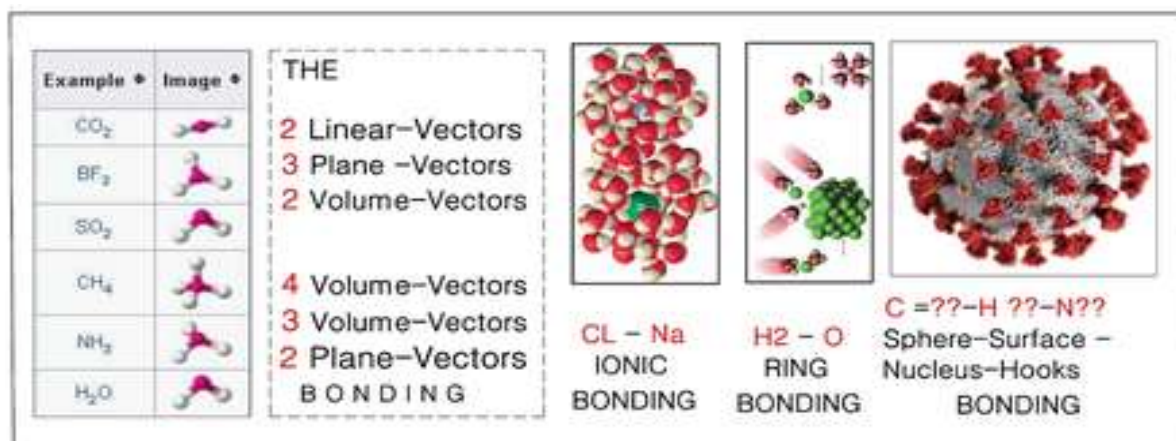


Figure - 31 –The Charges , follow Coulomb-law of Interactions and from Mechanics The-Angular-Momentum in order to Form The-Primary Particles and Primary- Forces . The **Inner-Stability** is obtained through The **Truss - Ptolemy's** -Theorem and **Rotation** through The **Four-Rotational-Ceba's** –Theorem .The **Primary-Particles and Forces** ,follow Material-Points-law of Interactions in order to Form **Quantum Vector** , Linear , Plane and Volume , BRACKETS , as **Elements-Type** , for **ATOMS** Bonding .

Atoms through , BRACKETS , with $\vec{E} = \nabla V$ as in first figures, Bond and form Composite Atoms and Molecules which in turn Crystals and the Sum of Matter , Anti-matter and Neutral matter .

Since Energy $\equiv$ motion = Force $\times$ d = $\sigma A d = [\sigma d].A = \{|\vec{Q} \rightrightarrows| \cdot A \}$,Implies The capture of motion in Space Volume $d A$. By this Way Stresses in Volume ,d, A, occupy the same magnitude in each Bracket.

Physical -Anti-Quadrature , Is The Conversion of The-Moving-Energy- |Orthogonal- Cone $|k_x.k_y|.|AK_A| \equiv PN.[\sqrt{\pi}.r]^2 \equiv |\vec{E}_E = \leftrightarrow |x|\vec{E}_M = \uparrow |x|\lambda| \rightarrow$ To An-Movable-Equal Energy-Sphere Cone $\equiv \mathbb{C} k.\pi.r^3$ in $\lambda \leftarrow$

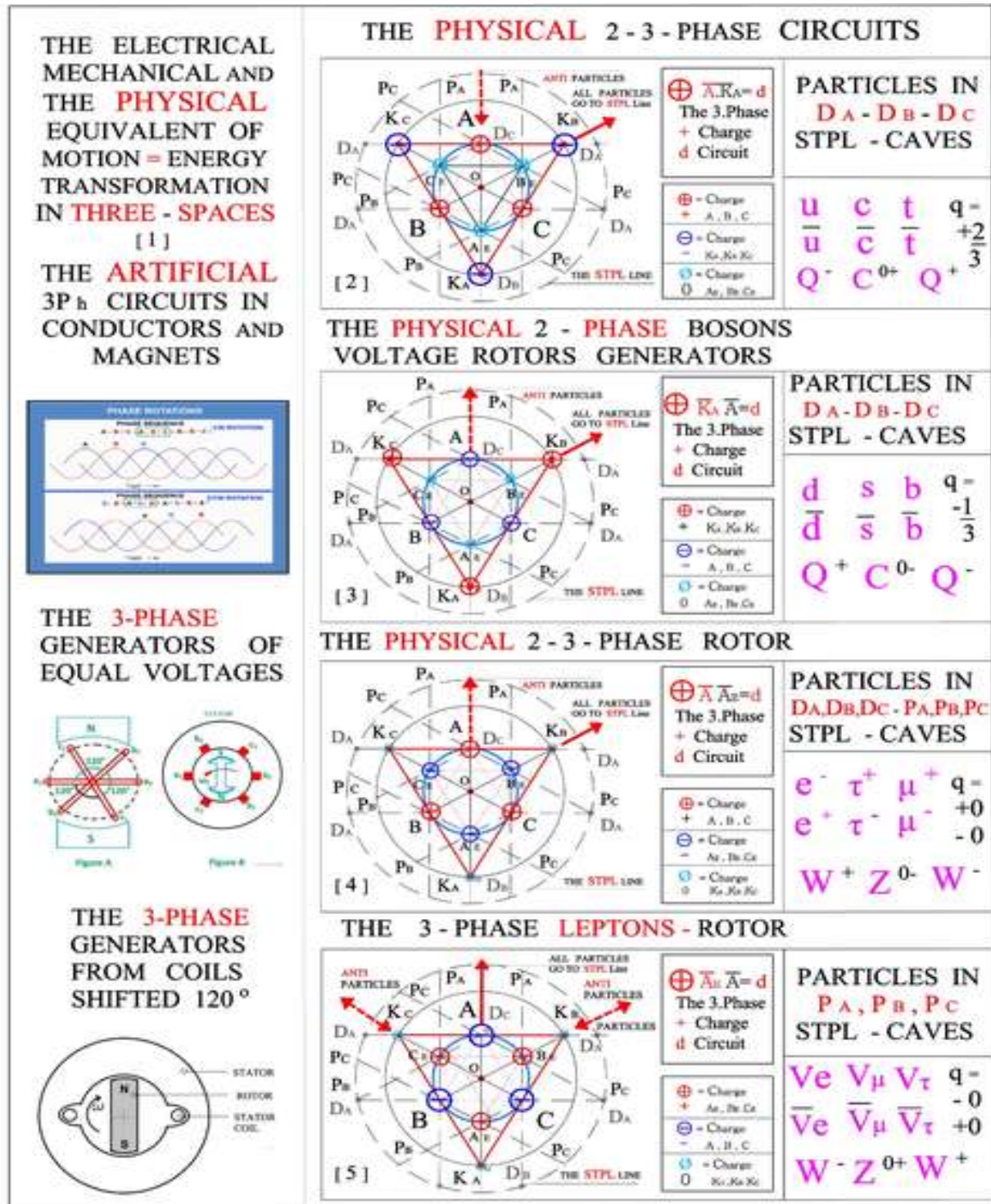


Figure - 32- (1) → The Artificial 2-3-Phase Circuits from Coils Shifted at , 60 ° , 120 ° , 180 ° Phase different .
(2) → The **Physical** 2-Phase of → {⊕-Space [A B C]}, {⊖-Anti-Space [K_A K_B K_C]}, {[(⊕ ↔ ⊖)]}

Creates the Strong Quantum Chromodynamics-Forces , $Q^\pm$, $C^{\pm 0}$, $D^\mp$, and Quarks Anti-Quarks , of charges $q = \frac{2}{3}$, $\frac{-1}{3}$, While for the 3-Phase → {⊕-Space [K_A K_B K_C]}, {⊖-Anti-Space [A B C]} Create The Weak Electromotive-Forces $W^\pm$, $C^{\pm 0 \mp}$, $W^\mp$, The Leptons , Anti-Leptons and Neutrinos Anti-Neutrinos with charges $q = q^{+0-}$ respectively. **Energy-Squares** $\equiv [AK_A]^2 = [BK_B]^2 = [CK_C]^2 = [EM]^2$

In (1). The Electrical System Voltage-drop - ΔV - becomes from a Battery of Voltage , V , which Voltage Produces a current , $i = \frac{\Delta V}{R} = \frac{q}{t}$, in an circuit , **Conductor** AK_A , of R Resistance .

The corresponding Mechanical System Voltage-drop $\equiv$ Pressure - ΔH - becomes from an Pressure-Head ,a Pump , which Produces a Flow-Rate , $Q = \frac{\Delta H}{R}$, in an Pipe-Conductor of R-Resistance , *Reynolds number*..

2.. **Electromotive-Charge-Forces** $\bar{F}_{AKA}$ as current $i = C \frac{dU}{dt} = AK_A \left\{ \frac{dQ[AKA]}{dt} \right\} = 2|AK_A| \cos\left(\frac{\phi}{2}\right) \cdot \cos\{kx - wt + \phi/2\}$ for $\phi \rightarrow -2\pi, 0, 2\pi, 4\pi, \dots, 2N\pi$, **Create FROM Constructive-Interference**, $i_{KA[C]} = 2|AK_A| \cdot [\cos\left(\frac{\phi}{2}\right) \cdot \cos[kx - wt]]$ **The Strong-Forces** in Points **P** , AND from $\rightarrow \{ i = \frac{\Delta \bar{V}}{R} \} = i_{KB(A)[C]} = 2|K_B A| \cdot [\cos\left(\frac{\phi}{2}\right) \cdot \cos[kx - wt]]$, **Strong - Quarks** in **D** with Charge $\bar{q} = \frac{+2}{3}$, AND for **Destructive-Interference** , $\phi \rightarrow -1\pi, 0, 1\pi, 3\pi, \dots, N\pi$, the **Anti-Strong Forces** in Points **P** , and the **Weak-Quarks** with Charge $\bar{q} = \frac{-1}{3}$ in Points **D** of { STPL-Circuit }.

In (2). The Physical -System , { consisted of Space-triangle , A B C , Anti-Space-triangle , $K_A K_B K_C$, and of Sub-Space-triangle , $A_E B_E C_E$, } , **Pressure-drop** $|\Delta \bar{V}|$ becomes from Coulomb Force , $|\Delta \bar{V}| = \frac{\oplus \cdot \ominus}{(AK_A)^2}$ on the Conductor , AK_A , and which Force is Created from **MAGNETS** $\equiv [\oplus \rightarrow \ominus]$.

The Strength of the Magnetic-field is , $H = \frac{\bar{m}}{r^2} = \frac{\text{magnetism} - \bar{m}}{\text{distance}^2} = k \cdot i = k \cdot \frac{\bar{q}}{T} = \left| \frac{k}{T} \right| \cdot q \equiv k \left| \frac{q}{v} \right| \equiv k \left| \frac{q}{c} \right|$, derived from Lorentz - Force $F = \bar{q} \vec{v} \times \vec{B}_F$, and k = Coulomb-constant..

The **Energy -flow - Rate** between The *Spaces* and The *Anti-Spaces* at Every -Time , i.e. *The In-between Conductors* $[\oplus \leftarrow r \rightarrow \ominus]$ distance is that of Magnets , **Becomes** from the **Coulomb-Forces** which follow The **Ptolemy's - Theorem** and , from $\pm$ **Spin** following **Cebas -Theorem** for the **System's - Equilibrium**. Conductor's - Force is A **Moving** and simultaneously **Rotating Energy-Quantity** $\equiv$ **Electromotive-Force** which builds the **Cosmic-Particles** as below .

$$\rightarrow |\Delta \bar{V}| = \frac{E}{q} = Q_{\pm} = \left| \frac{c \cdot \bar{S}}{r^2} \right| a = \left| \frac{q_1 q_2}{r^2} \right| \cdot a = \left[\frac{2B \cdot a}{\Phi \pi r^4} \right]^2 \equiv - \left[\frac{c \cdot \bar{S}}{r^3} \right] \cdot \left\{ \frac{d}{a} [d \equiv AK_A, AC_E, A_E K_A, A_E A] \right\} \leftarrow$$

Triangle Δ -ABC Phase different is **Spaces-State** while Voltage V in cave r is $\rightarrow V = \frac{hf}{ev} = \frac{h}{ev} \cdot \frac{2}{r^3} \sqrt{g} = F = \bar{q} \vec{v} \times \vec{B}_F$.

The Electric-Potential ΔV of the **Physical-Rotor** becomes from the Coulomb-Force between the Charges , which **Physical - Charges** $\equiv$ are the Magnets , of the 2 , 3-Phase Circuits on **STPL Mechanism** . The 120° Phase-different is due to Triangle , Δ -ABC , while The Electric-Potential ΔV , of the **Physical-Rotor** becomes from Coulomb-force between Charges , which is equal to Current magnitude as for Point A , is $\rightarrow |\Delta \bar{V}| = \left| \frac{\oplus \cdot \ominus}{(AK_A)^2} \right|$.

The Right-hand Vectors **Rotation** creates the +Spin , while the left-hand Rotation creates the - Spin . The , $\pm$ Spin equilibrium is because follow Ceba's Vectors-theorem . The Right-hand Vectors-Conductor **Direction** creates the , + , Particles Q_+ , while The Left-hand Vectors **Direction** creates the , - , Particles Q_- or , the said Anti-Particles. The magnitude of this **Electromotive-Force** is $Q_{\pm} = \left| \frac{c \cdot \bar{S}}{r^2} \right| = E_T = Q_{\oplus \rightarrow \ominus}$, and the **Work Produced** from the

Centrifugal-Coulomb-Forces are **The-Elementary Particles** . Their Spin , $\bar{S}$, from the **Tangential-Forces** is ,

$$Q_{\pm} = \left| \frac{c \cdot \bar{S}}{r^2} \right| a = \left| \frac{q_1 q_2}{r^2} \right| a = \left[\frac{2B \cdot a}{\Phi \pi r^4} \right]^2 \equiv - \left[\frac{c \cdot \bar{S}}{r^3} \right] \cdot \left\{ \frac{d}{r} [AK_A] \right\} = - \left| \vec{Q} \Rightarrow \right| \cdot \left| \frac{d}{r} [AK_A] \right|$$

In (3)-(5). The Physical-System of Force-Charges Produce an 3 - Phase Rotor Machine :

An Example of Elementary-Forces and Charges :

State $\equiv$ Phase $\equiv$ Angles , **Charges** , $\oplus \equiv A, B, C$ - **Charges** , $\ominus \equiv K_A K_B K_C$ - **N-Positions** $\emptyset \equiv A_E, B_E, C_E$,

Equating Lorentz-Force $F_L = \bar{q} \vec{v} \times \vec{B}_F = 2\pi \cdot \bar{q} \bar{v} \cdot \left[\frac{f=1}{g} \right]$, Newton-Force $F_{NC} = \left| \frac{m \cdot v^2}{r} \right|$, Coulomb-Force $F_C = \left| \frac{\oplus \leftrightarrow \ominus}{r^2} \right|$

Spin $S = r \cdot m \cdot v$, Markos frequency $f_p = \frac{\sigma \Phi}{2\pi r}$, Duality Photon $\{ \bar{c} \cdot \left[\vec{f}_n \right] + \bar{c} \cdot \vec{f}_n \}$, then $F_L = \bar{q} \vec{v} \times \vec{B}_F = \left| \frac{m \cdot v^2}{r} \right|$ and $\bar{q} \cdot \vec{B}_F = \left| \frac{m \cdot v}{r} \right|$ or $\bar{q} \cdot \vec{B}_F \cdot r = m \cdot v$. and $\bar{q} \cdot \vec{B}_F = \left| \frac{m \cdot v}{r} \right| = \left| \frac{S}{r^2} \right|$, and by substitution then $\left| \frac{F_L}{c} \right| = \bar{q} \cdot \vec{B}_F = \left| \frac{S}{r^2} \right|$, or Force $F_L = \left| \frac{c \cdot S}{r^2} \right|$, i.e. **The-Charged-Forces** $Q_{\pm} = \left[\frac{c \cdot S}{r^2} \right] = \frac{2,9978 \cdot 10^8 \cdot [5,691952 \cdot 10^{-34}]}{[1,602 \cdot 10^{-19}] \cdot r^2} = 10,649939 \cdot 10^{-7} \cdot \left[\frac{1}{r^2} \right] \text{ eV} \dots (\text{e} \cdot \text{v})$

From magnetic-force $\vec{B}_F = \vec{Q}_F = \frac{\bar{S}}{q \cdot r^2} = \frac{5,691952 \cdot 10^{-34}}{1,602 \cdot 10^{-19} [r]^2} = 3,5092182 \cdot 10^{-15} \cdot \left| \frac{1}{r^2} \right|$, **Quantity** $3,5092182 \cdot 10^{-15} \text{ eV}$ is the **Border-line** between Strong , **Quantum-Chromo Dynamic** , $Q^{\pm}, C^{\mp}, D^{\mp}$, and **Weak** forces , $W^{\mp}, Z^{\pm}, W^{\pm}$, on Phases. The Spin-Energy **Gamma-ray** , γ , is the minimum Energy in-Planck's length , and equal to **E** = $h f / q$

the Impedance = $b / 200 = 5,55.10^{-20} = 5,6.10^{-20}$ = of that of Neutrino-cave $a_v = 5,6.10^{-20}$ m

The Total-Energy in caves is $\rightarrow L = \bar{B} \bar{w} = \frac{L.w}{2} w = \frac{\pi r^4}{2} [2\pi f]^2 = 2\pi^3 r^4 f^2 = r m v = r m . w r$, and mass

$$m = \frac{B}{r.v} = \frac{B}{r^2.w} = \frac{B}{r^2.2\pi f} = \frac{\pi^2 r^4}{r^2.2\pi} = \left[\frac{\pi r^2}{2}\right], \text{ while Kinetic-energy } K_E = mv^2/2 = \left[\frac{\pi r^2 c^2}{2}\right] = \frac{\pi r^2}{2} v^2 = \frac{\pi r^2}{2} [n.\pi.c]^2 = \frac{\pi^2 r^2}{2} 2c^2, \text{ or the Energy in Black-Holes -caves } \rightarrow B_E = n . \pi^2 . r^2 . c^2 = n (\pi r c)^2 \leftarrow [92]$$

The **Spring-like central-force** from a fix Point, *the Source*, on an attached, *probe*, mass becoming from $F = -k r = -k r \bar{r}$ as equation, $\ddot{x} + w^2 x = 0$, with a general solution, $x = A \sin w_n t + B \cos w_n t$, where A, B are constants and evaluated from the initial conditions and which, x , becomes

$$x = [\dot{x}(0)/w_n] . \sin w_n t + x(0) . \cos w_n t \quad \dots\dots(2)$$

The Unit-energy k in cave r , becomes from Kepler equation, $r^3 . f_n^2 = k$ and is, $k/r = r^2 f_n^2$, and

$$\text{from velocity } \bar{c} = w r = 2\pi f r \text{ then issues } f^2 r^2 = \frac{c^2}{4\pi^2} \text{ or } \rightarrow k/r = \frac{\bar{c}^2}{4\pi^2} = F_B = Q_c \leftarrow \dots\dots(3)$$

From equation $k/r = \frac{c^2}{4\pi^2} = \frac{k}{[\oplus d \ominus]}$, then $k = \frac{c^2 [\oplus d \ominus] = \bar{c}^2 d}{4\pi^2}$, where $r = d . AK_A$ and $d = \pm \frac{3r}{3}, \frac{2r}{3}, \frac{1r}{3}$

i.e. k is a moving, **a Pushing-force** F_B , with an Unit-Energy-Quantity $|F_B| = \left|\frac{\bar{c}^2}{4\pi^2}\right| . r$

In Resonance case, Vibration follows equation (2), $x = d = X \sin(wt - \phi)$. Motion results to an Harmonic Vibration with the same Period $T = \frac{2\pi}{w}$, but with a different Phase $\frac{\phi}{w}$ where $\max \phi = 90^\circ$ and when is zero $k - mw^2 = 0$, then $\tan \phi = \infty$. The applied force is the Linear Momentum $P . \sin wt$ which vibrates with Period $T = 2\pi . \sqrt{m/k}$ or frequency $f_t = \frac{1}{2\pi} \sqrt{k/m}$, which is very near to the Natural frequency. Resonance happens with the max-amplitude of Force, $P . \sin wt$, with the maximum value of vibration, which is for

$$\phi = 90^\circ \rightarrow X = \frac{P}{(k - mw^2) \cos \phi + cw . \sin \phi} = \frac{P}{cw} \leftarrow \text{and amplitude } P = c w X \quad \dots\dots(a)$$

The max-Vibration-amplitude of equation (a) is as above $X = d = \pm \frac{3r}{3}, \frac{2r}{3}, \frac{1r}{3}, r = AK_A$

Coulomb-Force for Charges is Force $F_c = C \frac{q_1 . q_2}{r^2} = C \frac{\oplus \ominus}{d^2} = C \frac{\sigma(-\sigma)}{d^2} = C \frac{-\sigma^2}{d^2} = C \left[\frac{2\pi f}{\phi}\right]^2$ and

$$C = k = \frac{\bar{c}^2 . d}{4\pi^2} = \frac{F_c . \Phi^2}{4\pi^2 f^2}, \text{ or } \rightarrow F_c = \frac{\bar{c}^2 f^2}{\Phi^2} d = [\sigma f]^2 . d = \sigma^2 f^2 . d, \text{ The Force-Magnitude .}$$

The Unit-Force $F_t = Q_{q_1 q_2} = q_1 q_2 f^2 . d = \frac{[q_1 . q_2] . S^2}{\pi^4 r^8} = \frac{[-s^4] . S^2}{\pi^4 r^8}$, where S = Spin, and force

$$F_t = -[s]^4 . \left(\frac{(5,691952.10^{-34})^2 \text{ Kg.s/m}}{\pi^4 (8,875.10^{-16})^8}\right) = d . [s]^4 . 8,421641.10^{-51}, \text{ and applied for } \textbf{Cosmic-Particles}.$$

The Total - Energy of an Elementary-Particle $\equiv$ Intrinsic Rotational + Kinetic Energy, and from

$$\text{Relation } B = r m v = S = \text{Spin and } m = \frac{B}{r.v} = \frac{B}{r.w r} = \frac{B}{r^2.w} = \frac{S}{r^2.w} = \frac{\pi r^2}{2}, \text{ Then Centrifugal-Energy}$$

$$= \text{Kinetic - Energy} \rightarrow E_K = \frac{m}{r} v^2 = \frac{v^2}{r} \left[\frac{S}{r^2.w}\right] = \frac{w^2 r^2 . S}{r . r^2 . w} = \frac{w . S}{r} = \frac{2\pi f . S}{r} \equiv \frac{2.S^2}{r^5} = \frac{c.S}{r^2}.$$

Complex Numbers, Quaternion and Resonance :

Rotation of $[\oplus]$ constituent around $[\ominus]$ constituent in Material point is equivalent to a force $T = F_0$ Eternally and Sinusoidal acting on String $AK_A = x$, and is according to the differential equation,

$$m\ddot{x} + c \dot{x} + kx = F_0 . \sin wt \quad \dots\dots\dots (11) \quad [82A] \quad \text{where ,}$$

m = The mass of the $[\oplus]$ constituent related to acceleration,

c = A constant related to its velocity $\dot{x}$,

k = A constant related to its displacement, x ,

w = The circular velocity of the $[\oplus]$ constituent related to the tension $T = \pm \sigma$

t = The time of rotation.

$w_n = \sqrt{k/m}$ = The natural frequency of undamped oscillation

$c_c = 2mw_n$ = Critical damping

$\zeta = c / c_c$ = Damping factor.

The Vector - Force - Polygon of equation (11), (Fig-32.2) is consisted of force in different orientations, and if the force had been $\rightarrow F_0 . \cos wt$, instead of, $F_0 . \sin wt$, The Vector- Force -Polygon would be unchanged and the Terms of the equation then would have been The, **Projections of the Vectors on the Vertical axis ..**

Taking note of this, Then could let the Harmonic - Force be represented by the equation,

$$F_0 . (\cos wt + i . \sin wt) = F_0 . e^{iwt} \quad \dots\dots\dots (12) \quad \text{where } F_0 = \text{The maximum Force-Vector}$$

This would be equivalent to multiplying the quantities along the Vertical axis by $i = \sqrt{-1}$, with Phase ϕ and using complex vectors. The Displacement can then be written as,

$$X = |X| . e^{i(wt - \phi)} = [X . e^{-\phi}] . e^{iwt} = \bar{X} . e^{iwt} \quad \dots\dots\dots (13) \quad \text{where ,}$$

$\bar{X}$, is a Complex-Displacement - Vector equal to $[X.e^{-\varphi}]$, and by substituting into the differential equation and cancelling from each side of the equation , then results to $\rightarrow (-w^2 m + k w + k) \bar{X} = F_0) \leftarrow$ and $\bar{X} = \frac{F_0}{(k - w^2 m) + i.(c w)} = \frac{F_0/k}{(1 - (\frac{w}{w_n})^2 + i[2\zeta \frac{w}{w_n}])} \dots\dots(13a)$, and by introducing the Complex-frequency

Response $H(w)$ defined as the Output divided by the Input then becomes ,

$$H(w) = \frac{\bar{X}}{F_0} = \frac{1/k}{1 - (\frac{w}{w_n})^2 + i.(2\zeta \frac{w}{w_n})} = \frac{1 - [\frac{w}{w_n}]^2}{[1 - (\frac{w}{w_n})^2]^2 + [2\zeta \frac{w}{w_n}]^2} - i . \frac{2\zeta \frac{w}{w_n}}{[1 - (\frac{w}{w_n})^2]^2 + (2\zeta \frac{w}{w_n})^2} \dots\dots (14)$$

Equation (14) shows that **at Resonance The Real - Part is Zero , and The Response is given by the**

Imaginary-Part - ONLY, which is $\rightarrow H(w) = -i . \frac{1}{2\zeta}$, and **Phase angle** is $\rightarrow \tan \varphi = \frac{2\zeta \frac{w}{w_n}}{1 - (\frac{w}{w_n})^2} \dots(14a)$

The general solution of equation (11) consists of two Parts , *The complementary function* , which is the solution of the *Homogenous equation* , and the Particular Integral , as

$$x = A.\sin(wt - \varphi) + e^{-\frac{c}{2m}t} [C_1 \sin \theta t + C_2 \cos \theta t] \quad \text{where ,}$$

$$\theta = (\sqrt{4mk - c^2})/m, \tan \varphi = \frac{c w}{k - mw^2} , A = \frac{F_0 \cos \varphi}{k - mw^2} = \frac{F_0}{\sqrt{k^2 + (c^2 - 2mk)w^2 + m^2 w^4}} = \frac{F_0}{(k - mw^2) \cos \varphi + cw \sin \varphi} \dots(15)$$

When the System is subjected to Harmonic excitation , it is forced to vibrate at the same Natural Frequencies as that of the excitation $\bar{Q} \Rightarrow \overrightarrow{AK_A} = [\oplus - d - \ominus] = \overrightarrow{AK_A}$, and then **a condition of Resonance** is encountered and (15) becomes $x = A.\sin(wt - \varphi)$, i.e. an Harmonic vibration with the same Period $T = 2\pi/w = \frac{\varphi}{w}$ but with time Hysteresis $T_H = \frac{\varphi}{w}$, or a difference in Phase angle φ . **Because $F_c = Q_{\overrightarrow{AK_A}}$** is compelled to **change -Velocity** from , $v_A = 0$, $v_d = \vec{c}$, $v_{K_A} = 0$, and $c = 0$ at Edge-Points A , K_A , Then angle φ becomes zero , and for $w = \sqrt{k/m}$ or , $k = mw^2 = 0$ issues $\tan \varphi = \infty$ and $\varphi = 90^\circ$, and Force $\rightarrow F_0.\sin wt$ is vibrated with Period $T_R = 2\pi\sqrt{\frac{m}{k}}$, and an amplitude $A = F_0 / c w$, tends to zero for infinite $c = \infty$, 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 , at Response , 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 , $f_n = \frac{(1 + \sqrt{5}).\sigma}{4\pi l}$ in Points K , K_1 or , the Rotational vibration Plan Energy which is , The Spin as $[K \equiv \ominus s^2 \cup \cup K_1 \equiv \oplus s^2] \equiv \bar{B}$. 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 $\bar{w}$. When a Frequency of Excitation coincides with one of the Eigenvalues **Natural - frequencies of Material-Point Then it is a condition of **Resonance** and encountered as above .**

It was Proved that Units = Monads ,and they have their place in Spaces .From the Second-order differential equation excited by a Harmonic external force , $F_t \sin wt$, which is as , $m \frac{d^2x}{dt^2} + c \frac{dx}{dt} + k . x = F_t \sin wt$ corresponds Physically to the free damped vibration , where x = The Displacement , dx / dt = The velocity and d^2x / dt^2 = The acceleration of monad , m, c , k constants ,with The general solution given by equation ,

$$x = A . e^{s_1.t} + B . e^{s_2.t} + X \sin(wt - \varphi) \dots\dots(1)$$

In Electromagnetism , Change , say a Space-monad is $\rightarrow$ **a Resonance** which can occur in the RLC circuit , where **Resistance R** , is the change in current amount it is the converter of current , **Inductance L** , is like mass or Inertia in Mechanical systems which store the Magnetic-energy and , **Capacitance C** , concentrates ($\pm$) charge which store the Electric-energy in much the same way that springs store mechanical energy *inverse spring constant* , is the analogous n Mechanics .

The differential equation excited by a Harmonic Electromotive force, $E_t \sin wt$, in an RLC circuit, oscillating at its natural frequency is as, Equation $\rightarrow L \frac{d^2q}{dt^2} + R \frac{dq}{dt} + \frac{1}{C} q = E_t \sin wt$.

which is applied for the, **Beyond-Cosmic-Particles-Region**, becomes as a Charge-Force,

$$Q_{AK_A} = \frac{\bar{x}}{H(w)} = [-i.2k\zeta] = -(\frac{\bar{c}s}{r^3}) \cdot [\pm \frac{3}{3} [AK_A], \frac{2}{3} [AK_A], \frac{1}{3} [AK_A] | \dots q.e.d.$$

In Fig-33 the, $\oplus, \ominus$, charges Interact each other through the Inner-Connectors for Stability. The motion of the $\oplus$ constituent to the $\ominus$ constituent creates Work from the Coulomb Force F_c , and Connector, d , equal to Inner

Connectors in, **Conductors $\equiv$ Displacements r** , where $\rightarrow r = AK_A$ and Interference $k = \frac{c^2[\oplus d \ominus] = \bar{c}^2 r}{4\pi^2} = \frac{\bar{c}^2 r}{4\pi^2}$

THE 2 - ELEMENTS BONDING :

The Interaction of Electron e^- , and Electron-neutrino ν_e , is $\rightarrow e^- \nu_e \equiv [-1-0+W^-] \equiv \Sigma_{D_A \rightarrow P_A}^{[\nu_e e^-]}$

The Summation of E-neutrino $[\nu_e = -0]$ in Cave P_A , **Attacks** $\Rightarrow$ Electron $[e^- = -1]$ in Cave P_A of STPL as (v), **and** creates the Constructive-Interference-Force $[\ominus \rightarrow \ominus = \ominus \ominus] \equiv CI_{=0-}^- \equiv W^-$

The Process from measurements,

1... DATA.

Electron-mass $m_e = 9,11.10^{-31}$ Kg, Charge $q_e = 1,602.10^{-19}$ C, Diameter $a = 5,0.10^{-17}$ m

E-neutrino $m_{\nu_e} = 3,922.10^{-36}$ Kg, Charge $q_{\nu_e} = 1,602.10^{-19}$ C, Diameter $a = 5,0.10^{-18}$ m, becoming

Or from $m_e = 0,511.10^6$ eV/c² = (17,826614. 10^{-37}).0,511. 10^6 Kg = 9,1094. 10^{-31} Kg

$m_{\nu_e} = 22.10^{-7}$ MeV/c² = 22. 10^{-7} . 10^6 eV/c² = 2,2eV = 2,2.(17,8266. 10^{-37}) = 3,922. 10^{-36} Kg

2... THE SYSTEM.

The two Particles are Two Waves $\{ y_1 = \cos(kx - wt), y_2 = \cos(kx - wt + \delta) \}$ where, δ , is the Phase difference, k , is the wave number, x , is the wave Position and, t is the time which Interact as the **One Parallel-Harmonic-Resistors-Connection** as $\rightarrow [\nu_e e^-]$.

The Total-Harmonic-mass System M_T is $\rightarrow \frac{1}{M_T} = \frac{1}{m_e} + \frac{1}{m_{\nu_e}} = \frac{10^{32}}{0,911} + \frac{3.10^{32}}{0,0003922} = \frac{0,9113922.10^{32}}{0,0003572} = \frac{10^{32}}{0,0003919}$
 $M_T = 0,0003919.10^{-32}$ Kg = 3,919. 10^{-36} Kg.

The Total- Resonance-Harmonic-Charge System $\rightarrow Q_T \equiv q_e + q_{\nu_e} = -1,6022.10^{-19} + 0 = -1,6022.10^{-19}$ C

Frequency Unit-Cave is the Stationary-System becoming from Kepler second Planetary-law equation $4\pi^2 m f^2 o = k$, and constant law of Areas $l = k \cdot f^2 o \cdot a^3$. Their common k , is the Constant-Energy

$$k = 4\pi^2 m f^2 p = \frac{1}{f^2 p a^3} \quad \text{or} \quad f^4 p = \frac{1}{4\pi^2 m a^3} \quad \text{and} \quad f p = \sqrt[4]{\frac{1}{4\pi^2 m a^3}}, \quad \text{so}$$

The frequency is becoming from this Equally- Resonance-Energy and is the One Mass frequency as

$$f_{\nu_e \rightarrow e} = \sqrt[4]{\frac{1}{4\pi^2 m a^3}} = \sqrt[4]{\frac{1}{4\pi^2 3,919.10^{-36} (5,10^{-18})^3}} = \sqrt[4]{51,707428.10^{84}} = 2,6815643.10^{21} \text{ H}$$

The Energy of the System is $E_{\nu_e \rightarrow e} = h \cdot f_{\nu_e \rightarrow e} = 6,62606957.10^{-34} \cdot 2,6815643.10^{21} = 17,768231.10^{-13}$ Joules / $1,6022.10^{-19}$ C = 11,089895. 10^6 eV = **11,089895 MeV**.

The Magnetic-fields laws for Charges and Periods are $\rightarrow T = \frac{2\pi \cdot m_T}{Q_T \cdot \bar{B}_F}$, $\bar{B}_F = \frac{2\pi \cdot m_T}{Q_T \cdot T} = \frac{|2\pi \cdot m_T|}{Q_T} f$, so the

Magnetic field Force $\bar{B}_F = \frac{|2\pi \cdot m_T|}{Q_T} f_{\nu_e \rightarrow e} = \frac{2\pi \cdot [3,919.10^{-36}] \cdot 2,6815643.10^{21}}{1,6022.10^{-19}}$ (Kg/Cs) = **0,4121237. 10^6 Tesla**.

From Energy-Relation $W = 2E = B \cdot w = J \cdot w^2$, or **$2E = 2\pi f B$** then **Total - Spin*Frequency** $\bar{B} f = \frac{E}{g}$, and

Energy $E = \bar{S} \cdot g \cdot f = 5,691952.10^{-34} \{ \text{Kg/m/s} \} \cdot g \cdot [2,6815643.10^{21} \text{ H}] / 1,6022.10^{-19} = 9,3433859.10^6$ eV or

$E = 9,3433859$ MeV, which is **The Energy Produced from, Total-System-Spin**.

From Planck's length $a = \sqrt[3]{\frac{k}{f^2}}$ then $k = a^3 \cdot f^2$, and since **Energy** $E = k$ then Cave $a = \sqrt[3]{\frac{E}{f^2}}$, and the

$$\text{Action-Range } a = r_B = \sqrt[3]{\frac{E}{f^2}} = \sqrt[3]{\frac{9,3433859.10^6}{(2,6815643.10^{21})^2}} = \sqrt[3]{1,299355.10^{-36}} = 1,09121235.10^{-12} \text{ m},$$

The **Weak Force W^-** in System is the Coulomb's Force $\rightarrow [e^- \nu_e] \equiv [-1-0+W^-]$ which may be calculated from the Time needed, for Harmonic-mass to Vibrate in Magnetic-cave r_B following the Energy equation $r_B = \frac{m \cdot v}{q \cdot B} =$

$$= \frac{[3,919.10^{-36} \text{ Kg}][2,9978.10^8]}{1,6022.10^{-19} \cdot [0,4121237.10^6]} = \mathbf{17,792361.10^{-15} \text{ m}}, \text{ and for Weak Force } \mathbf{W^-} \text{ in cave } \mathbf{d=10^{-15} \text{ m}}, \text{ then Period}$$

$$\mathbf{T} = \frac{\mathbf{d}}{\mathbf{c}} = \frac{17,792361.10^{-15} \text{ m}}{[2,998.10^8 \text{ m/s}]} = \mathbf{5,9351394.10^{-23} \text{ s}}, \text{ and the Produced Energy in } \mathbf{d}, \text{ is } \mathbf{E_{W^-}} = \frac{\mathbf{h}}{\mathbf{T}} \text{ or ,}$$

$$\mathbf{E_{W^-}} = \frac{1,055.10^{-34} \text{ J.s}}{2 \cdot [5,9351394.10^{-23} \text{ s}][1,602.10^{-19} \text{ J/eV}]} = 5,5472.10^6 \text{ eV} \equiv \mathbf{5,55 \text{ MeV}}, \text{ and because from Coulomb-Force}$$

$$\mathbf{F_C} = \frac{\mathbf{C.Q}}{\mathbf{r^2}} \text{ and } \mathbf{V_C} = \frac{\mathbf{C.Q}}{\mathbf{r}}, \text{ then issues } \rightarrow \text{Weak-Force } \mathbf{W^-} = \left[\frac{\mathbf{E_{W^-}}}{\mathbf{r_B}} \right] = \frac{5,5472.10^6}{17,792361.10^{-15}} = \mathbf{3,1177424.10^{20} \text{ eV}},$$

$$\text{so the Weak-Force is } \mathbf{W^-} = \left[\frac{\mathbf{h/T}}{2 \cdot \mathbf{r_B}} \right] = \left[\frac{\mathbf{h.c/d}}{2 \cdot \mathbf{r_B}} \right] = \frac{\mathbf{h.c}}{2 \cdot \mathbf{d.r_B}} = \left| \frac{\mathbf{h.c}}{2 \cdot \mathbf{e.r_B^2}} \right| \text{ eV} \dots\dots(\mathbf{w-f})$$

The above Interaction-System is figured as follows ,

$$[\mathbf{e^-v_e}] \equiv \{-1\mathbf{-0+W^-}=[-1]+\langle \mathbf{W^-} \rangle\} \equiv \Sigma \left[\begin{smallmatrix} \mathbf{v_e} \rightarrow \mathbf{e^-} \\ \mathbf{D_A} \rightarrow \mathbf{P_A} \end{smallmatrix} \right], \quad (-1|\mathbf{W^-})\text{Force} \equiv \text{Cl } \mathbf{-0 \rightarrow -1} \equiv \rightarrow \mathbf{n-p} \leftarrow \text{or Bonding}$$

$$[\mathbf{e^-v_e}] \equiv [-1\mathbf{-0+W^-}] \equiv (-1|\mathbf{W^-}) \equiv [\mu^+\mathbf{v_\mu}] \equiv [\tau^+\mathbf{v_\tau}] \rightarrow \text{i.e. The } \mathbf{Leptons} \text{ Combinations } \mathbf{Produce} \\ \mathbf{The Same Composites} \quad (-1|\mathbf{W^-}) \equiv [\mathbf{d\bar{u}}] \equiv [\mathbf{s\bar{c}}] \equiv [\mathbf{b\bar{t}}], \text{ as those in } \mathbf{Quarks} \text{ Combinations} \quad , \text{i.e.}$$

The, Interaction of Electron , $\mathbf{e^-}$, and Electron-neutrino $\mathbf{v_e}$, gives Charges , -1 , - 0 , and an Coulomb-Force $\mathbf{W^-}$, which according to Voltage (v) , is the **Constructive-Interference** (- 0) $\rightarrow$ (-1) = $\mathbf{W^-}$.The **Summation** of Charges shows the **Action** $[\oplus \equiv -0] \rightarrow [\ominus]$, of the Coulomb-Force $\mathbf{W} \equiv \mathbf{W^-}$ as above because , $\oplus \rightleftharpoons \ominus$, and the Direction of motion is from $\mathbf{D_A}$ to $\mathbf{P_A}$ Voltage-Point-Cave , with Energy-Voltage from , $\mathbf{G}$ to $\mathbf{\gamma}$, Forces .

$$\text{For Combinations } \rightarrow [\mathbf{e^-v_e}] \equiv [-1\mathbf{+0+Z^-}] \equiv (-1|\mathbf{Z^-}) \equiv [\mu^+\mathbf{v_\mu}] \equiv [\tau^+\mathbf{v_\tau}] \equiv [\mathbf{e^-v_\mu}] \equiv [\mathbf{e^-v_\tau}]$$

$$\text{For Combinations } \rightarrow [\mathbf{e^-}\mu^+] \equiv [-1\mathbf{-1+W^{--}}] \equiv (-2|\mathbf{W^{--}}) \equiv [\mathbf{e^-}\tau^+] \equiv [\mu^+\tau^+]$$

$$\text{For Combinations } \rightarrow [\mathbf{e^-e^+}] \equiv [-1\mathbf{+1+Z^0}] \equiv (0|\mathbf{Z^0}) \equiv [\mu^+\mu^-] \equiv [\tau^+\tau^-] \rightarrow [\mathbf{e^+v_e}] \equiv (1|\mathbf{Z^+})$$

$$\text{For Combinations } \rightarrow [\mathbf{v_e}\bar{\mathbf{v_e}}] \equiv [-0\mathbf{+0+Z^0}] \equiv (0|\mathbf{Z^0}) \equiv (0|\mathbf{Z^0}) \equiv [\mathbf{v_\mu}\bar{\mathbf{v_\mu}}] \equiv [\mathbf{v_\tau}\bar{\mathbf{v_\tau}}]$$

For , **Quarks** $\rightarrow$ **Quarks** , Combinations issues ,

$$\text{For 2-Combinations } \rightarrow [\mathbf{u\ d}] \equiv \left[+\frac{2}{3}\mathbf{-\frac{1}{3}+Z^+} \right] \equiv \left(+\frac{1}{3}|\mathbf{Z^+} \right) \equiv [\mathbf{u\ s}] \equiv [\mathbf{u\ b}] \rightarrow \mathbf{K^0} \equiv [\mathbf{s\bar{d}}] \equiv (0|\mathbf{Z^0})$$

$$\text{For 2-Combinations } \rightarrow [\mathbf{u\ c}] \equiv \left[+\frac{2}{3}\mathbf{+\frac{2}{3}+W^{++}} \right] \equiv \left(+\frac{4}{3}|\mathbf{W^{++}} \right) \equiv [\mathbf{u\ t}] \equiv [\mathbf{c\ t}]$$

$$\text{For 2-Combinations } \rightarrow [\mathbf{u\bar{u}}] \equiv \left[+\frac{2}{3}\mathbf{-\frac{2}{3}+Z^0} \right] \equiv (0|\mathbf{Z^0}) \equiv [\mathbf{c\bar{c}}] \equiv [\mathbf{t\bar{t}}] \equiv [\mathbf{d\bar{d}}] \equiv [\mathbf{s\bar{s}}] \equiv [\mathbf{b\bar{b}}]$$

$$\text{For 2-Combinations } \rightarrow [\mathbf{u\bar{d}}] \equiv \left[+\frac{2}{3}\mathbf{+\frac{1}{3}+W^+} \right] \equiv \left(+\frac{3}{3}|\mathbf{W^+} \right) \equiv [\mathbf{c\bar{s}}] \equiv [\mathbf{t\bar{b}}]$$

$$\text{For 2-Combinations } \rightarrow [\mathbf{d\bar{d}}] \equiv \left[-\frac{1}{3}\mathbf{+\frac{1}{3}+Z^0} \right] \equiv (0|\mathbf{Z^0}) \equiv [\mathbf{s\bar{s}}] \equiv [\mathbf{b\bar{b}}] \equiv \rightarrow [\mathbf{e^-e^+}]$$

The Combinations $\rightarrow [\mathbf{d\bar{u}}] \equiv \left[-\frac{1}{3}\mathbf{-\frac{2}{3}+W^-} \right] \equiv (-1|\mathbf{W^-}) \equiv [\mathbf{c\bar{d}}] \equiv [\mathbf{t\bar{s}}] \equiv [\mathbf{e^-v_e}] \equiv [\mu^+\mathbf{v_\mu}] \equiv [\tau^+\mathbf{v_\tau}]$
Are Common for all Particles Leptons , Anti-leptons , and for Quarks , Anti-Quarks .

Since $[\mu^+\mathbf{v_\mu}] \equiv \pi^+ \equiv (-1|\mathbf{W^+})$ then $\pi^- = -\pi^+ = [\mu^-\bar{\mathbf{v_\mu}}] \equiv (+1|\mathbf{W^+}) \equiv (+1|\mathbf{Z^0})$ and Composite $\pi^0 = [\mu^+\mathbf{v_\mu}] + [\mu^-\bar{\mathbf{v_\mu}}] = [\mu^+\mu^-] + [\mathbf{v_\mu}\bar{\mathbf{v_\mu}}] \equiv (0|\mathbf{Z^0}) + (0|\mathbf{Z^0}) \equiv 2 \cdot \mathbf{Z^0} = 2\gamma$

$$\text{For 3-Combinations } \rightarrow [\mathbf{u\ d\ c}] \equiv \left[+\frac{2}{3}\mathbf{-\frac{1}{3}+\frac{2}{3}+Z^+} \right] \equiv \left(+\frac{3}{3}|\mathbf{Z^+W^+} \right) \equiv [\mathbf{c\ s\ t}] \equiv [\mathbf{t\ b\ u}] \equiv [\mathbf{t\ b\ c}]$$

$$\text{For 3-Combinations } \rightarrow [\mathbf{u\ u\ d}] \equiv \left[+\frac{2}{3}\mathbf{+\frac{2}{3}-\frac{1}{3}+W^+} \right] \equiv \left(+\frac{3}{3}|\mathbf{W^+Z^+} \right) \equiv [\mathbf{c\ c\ s}] \equiv [\mathbf{t\ t\ b}] \equiv [\mathbf{u\ c\ s}]$$

$$\text{For 3-Combinations } \rightarrow [\mathbf{d\ d\ u}] \equiv \left[-\frac{1}{3}\mathbf{-\frac{1}{3}+\frac{2}{3}+W^-} \right] \equiv (0|\mathbf{W^-Z^0}) \equiv [\mathbf{s\ s\ c}] \equiv [\mathbf{b\ b\ t}] \equiv [\mathbf{d\ s\ c}] \equiv [\mathbf{s\ b\ t}]$$

THE 3 - ELEMENTS BONDING :

A... PROTON is $\rightarrow [\mathbf{u\ u\ d}] \equiv \left[+\frac{2}{3}\mathbf{+\frac{2}{3}-\frac{1}{3}+W^+} \right] \equiv \left(+\frac{3}{3}|\mathbf{W^+Z^+} \right) = \text{Two } \mathbf{u}\text{-Quarks and One } \mathbf{d}\text{-Quark} .$

Interaction of Up-Quark $\mathbf{u}$, and Up-Quark $\mathbf{u}$, is as $\rightarrow \mathbf{u\ u} \equiv \left[+\frac{2}{3}\mathbf{+\frac{2}{3}+W^+} \right] \equiv \Sigma \left[\begin{smallmatrix} \mathbf{u\ u} \\ \mathbf{D_A} \rightarrow \mathbf{D_A} \end{smallmatrix} \right]$ and the

Summation of Up-Quarks $[\mathbf{u\ +\ u}]$ of Cave $\mathbf{D_A}$, **Attacks** $\Rightarrow$ Down-Quark $[\mathbf{d} = -\frac{1}{3}]$ in Cave $\mathbf{P_A}$

Of STPL as (v) , creating the Destructive-Interference $[\oplus \rightarrow \ominus = +] \equiv \text{DI } \begin{smallmatrix} +, - \\ 0, + \end{smallmatrix} \equiv \mathbf{Z^+}$

Since ,u u, Summation occupies Constructive-Interference , $\mathbf{W^+}$, therefore is Stable .

The Process from measurements ,

1... DATA .

Up-Quark mass $m_u = 8,91.10^{-30}$ Kg , Charge $q_u = [+ \frac{2}{3}] . 1,602.10^{-19}$ C , Diameter $a = 5,0.10^{-17}$ m , The Down-Quark $m_d = 10,7.10^{-30}$ Kg , Charge $q_d = [- \frac{1}{3}] . 1,602.10^{-19}$ C, with an mean-Diameter $a = 5,0.10^{-18}$ m , or $\bar{a}$
 From $m_u = 5,0.10^6 \text{ eV}/c^2 = (17,826614. 10^{-37}).5.10^6 \text{ Kg}$ then = $8,913307.10^{-30}$ Kg
 $m_d = 6,0.10^6 \text{ eV}/c^2 = (17,826614. 10^{-37}).6.10^6 \text{ Kg}$ then = $10,695968.10^{-30}$ Kg

2... THE SYSTEM .

The three Particles are as the three Waves { $y_1 = \cos(kx - \omega t)$, $y_2 = \cos(kx - \omega t)$, $y_3 = \cos(kx - \omega t + \delta)$ } where , δ , is the Phase difference , k is the wave number , x is the wave Position and , t is the time which Interact as **One-Harmonic-mass-Resistor-System** as addition $\rightarrow [y_1 + y_2 \rightarrow y_3]$

The System Total-Harmonic-Mass is $\equiv M_T$ is $\rightarrow \frac{1}{M_T} = \frac{2}{m_u} + \frac{1}{m_d} = \frac{2.10^{30}}{8,9133} + \frac{10^{30}}{10,696} =$
 $= \frac{30,305243.10^{30}}{95,336656} = \frac{10^{30}}{3,1458799}$ and , $M_T = 3,1458799 . 10^{-30}$ Kg(1)

The System Total- Harmonic-Charge $\equiv Q_T \equiv 2.q_u + q_d = 2.(2/3).e - (1/3) e = + \frac{3}{3} e =$
 $+ 1,6022.10^{-19}$ C , and the **System-Resonance-Charge** $Q_T = + 1,6022.10^{-19}$ C(2)

Frequency Unit-Cave is the Stationary-System becoming from Kepler second Planetary-law equation , $4 \pi^2 m f_o^2 = k$, and constant law of Areas $l = k . f_o^2 . a^3$. Their common , k , is the Constant - Energy

$$k = 4 \pi^2 m f_p^2 = \frac{1}{f_p^2 a^3} \text{ or , } f_p^4 = \frac{1}{4 \pi^2 m a^3} \text{ and } f_p = \sqrt[4]{\frac{1}{4 \pi^2 m a^3}} , \text{ so}$$

The frequency becoming from this equal Resonance-Energy is the One-Mass frequency and it is

$$f_{2u \rightarrow d} = \sqrt[4]{\frac{1}{4 \pi^2 m . a^3}} = \sqrt[4]{\frac{1}{4 \pi^2 3,1458799 . 10^{-30} (5.10^{-19})^3}} = \sqrt[4]{805,18982 . 10^{80}} = 5,3269.10^{20} \text{ H}$$

The System's Energy is $E_{2u \rightarrow d} = h . f_{2u \rightarrow d} = 6,62606957.10^{-34} . 5,3269.10^{20} = 35,29641.10^{-14} \text{ Joules} /$
 $/ 1,6022.10^{-19} \text{ C} = 22,029965.10^5 \text{ eV} = \mathbf{2,2029965 \text{ MeV}}$ (3)

The Magnetic-fields laws for Charges and Periods are , $T = \frac{2 \pi . m_T}{q . B_F}$, $B_F = \frac{2 \pi . m_T}{q . T} = \frac{|2 \pi . m_T|}{Q_T} f$, so
 $B_F = \frac{|2 \pi . m_T|}{Q_T} f_{2u \rightarrow d} = \frac{2 \pi . [3,1458799 . 10^{-30}] 5,3269.10^{20}}{1,6022.10^{-19}} (\text{Kg/Cs}) = \mathbf{65,7 . 10^9 \text{ Tesla}}$ (4)

From Energy-Relation $W = 2E = B w = J . w^2$, or $2E = 2 \pi f B$ then **Total -Spin*Frequency** $\bar{B} f = \frac{E}{g}$, and
 $E = \bar{S} . g . f = 5,691952.10^{-34} \{ \text{Kg/m/s} \} . g . [5,3269.10^{20} \text{ H}] / 1,6022.10^{-19} = 1,8562244.10^6 \text{ eV} = \mathbf{1,85622 \text{ MeV}}$

i.e. The Energy Produced from Total-Spin- System .

From Planck's length $a = \sqrt{\frac{k}{f^2}}$ then $k = a^3 . f^2$, and since **Energy** $E = k$ then Cave $a = \sqrt[3]{\frac{E}{f^2}}$ and **Action-Range**

$$a = \sqrt[3]{\frac{E}{f^2}} = \sqrt[3]{\frac{[22,029965.10^5]}{(5,3269.10^{20})^2}} = \sqrt[3]{7,763628.10^{-36}} = 1,98010509.10^{-12} \text{ m} .$$

The Weak Forces , $W^+ Z^+$, in System is the Coulomb's Force $\rightarrow [u+u] > [d] \equiv [\frac{4}{3} - \frac{1}{3} + W^+ Z^+]$ which may calculated from the Time needed , for Harmonic-mass to vibrate in cave r_B , and from the Energy equation

$$r_B = \frac{m . v}{q . B} = \frac{[3,1458799.10^{-30} \text{ Kg}] . 2,9978.10^8}{1,6022.10^{-19} . [65,7 . 10^9]} = \mathbf{8,959064.10^{-14} \text{ m}}$$
(5)

and for Weak Forces , $W^+ Z^+$, in cave $d = 10^{-14} \text{ m}$ then Period $T = \frac{d}{c} = \frac{8,959064.10^{-14} \text{ m}}{[2,998.10^8 \text{ m/s}]} = \mathbf{2,9883468 . 10^{-22} \text{ s}}$,

and The produced Energy in d , is $\rightarrow E_{W^+ Z^+} = \frac{h}{T} = \frac{1,055.10^{-34} \text{ J.s}}{2 . [2,9883468.10^{-22} \text{ s}] . [1,602.10^{-19} \text{ J/eV}]} = 1,10173.10^6 \text{ eV} \equiv$

1,102 MeV ..(6) and from Coulomb Force $F_C = \frac{C.Q}{r^2}$ and Voltage $V_C = \frac{C.Q}{r}$, then **Force** $[F_C] \times \text{Cave } [r] \equiv$
Voltage $[V_C]$, so Weak-Forces $\rightarrow W^+ Z^+ = \left[\frac{E_{W^+ Z^+}}{r} \right] = \frac{1,1017.10^6}{8,959064.10^{-14}} = \mathbf{1,229736.10^{19} \text{ eV}}$...(7) or from W- Forces

$$W^+ Z^+ \equiv \left[\frac{h/T}{2 . r_B^2} \right] \equiv \left[\frac{h.c/d}{2 . r_B^2} \right] \equiv \frac{h.c}{2 . d . r_B^2} \equiv \left[\frac{h.c}{2e . r_B^2} \right] \text{ eV} = \frac{1,055.10^{-34} \text{ J} . [2,998.10^8 \text{ m/s}]}{2 . [1,602.10^{-19} \text{ J/eV}] . [8,95906.10^{-14}]^2} \equiv \mathbf{1,2297.10^{10} \text{ eV}}$$

Remarks :

- a.... The Mass and Charge of Primary-Particles is measured in eV and is changed to Kg.
- b... The Harmonic-Resistor-Connection Mass M_T follows the Ohm's Inverse-Resistance law.
- c... The System of Masses and Charges is transformed to an-Resultant-mass Oscillating System.
- d... The System's-Frequency follows Kepler-Planetary-laws and Plank's Energy .Coulomb laws are for measuring the Magnetic fields , circular Orbits and Forces .

B... NEUTRON is $\rightarrow [d d u] \equiv [-\frac{1}{3} - \frac{1}{3} + \frac{2}{3} + W^-] \equiv (0 | W^- Z^0) =$ Two **d**-Quarks and One **u**-Quark .

Interaction of Down-Quark **d** , and Down-Quark **d** , is $\rightarrow d d \equiv [-\frac{1}{3} - \frac{1}{3} + W^-] \equiv \Sigma_{P_A > P_A}^{[d+d]}$, and the Summation of Down-Quarks $[d + d]$ of Cave , P_A , **Is attacked** $\ll=$ by the , Up-Quark $[u = +\frac{2}{3}]$ in Cave D_A Of STPL line as relation (v) , **OR** Positive Up-Quark $[u = +\frac{2}{3}]$ **Attacks** $\Rightarrow$ the Down-Quarks $[d + d]$ of Cave P_A of STPL line , and creates the Destructive-Interference as $[\oplus \rightarrow \ominus = 0] \equiv [+ \frac{2}{3} - \frac{2}{3} + Z^0]$ or , $CI \rightarrow \ominus^- \equiv [W^-] + DI \rightarrow \ominus^- \equiv Z^0$ and $[d d u] \equiv (0 | W^- Z^0)$
The Process from measurements ,

1... DATA .

The Down-Quark-mass $m_d = 10,7.10^{-30} \text{Kg}$, Charge $q_d = [-\frac{1}{3}] . 1,602.10^{-19} \text{C}$,
mean-Diameter $a = 5,0.10^{-18} \text{m}$. Up-Quark mass $m_u = 8,91.10^{-30} \text{Kg}$,
Charge $q_u = [+ \frac{2}{3}] . 1,602.10^{-19} \text{C}$, Diameter $a = 5,0.10^{-17} \text{m}$, or $\cup$
Or from $m_d = 6,0.10^6 \text{eV}/c^2 \rightarrow (17,826614. 10^{-37}) . 6.10^6 \text{Kg} = 10,695968.10^{-30} \text{Kg}$
 $m_u = 5,0. 10^6 \text{eV}/c^2 \rightarrow (17,826614. 10^{-37}) . 5.10^6 \text{Kg} = 8,913307.10^{-30} \text{Kg}$

2... THE SYSTEM .

The three Particles are three Waves $\{ y_1 = \cos(kx - \omega t), y_2 = \cos(kx - \omega t), y_3 = \cos(kx - \omega t + \delta) \}$ where , δ , is the Phase difference , k , is the wave number , x , is the wave Position and , t , is the time which Interact as **One Harmonic-mass-Resistor-System** as $\rightarrow [y_1 + y_2 \rightarrow y_3]$. **The Total-Harmonic-Mass-System** $\equiv M_T$ and is $\frac{1}{M_T} = \frac{2}{m_d} + \frac{1}{m_u} = \frac{2.10^{30}}{10,696} + \frac{10^{30}}{8,9133} = \frac{28,522108.10^{30}}{95,336656} = \frac{10^{30}}{3,3425529}$ and , $M_T = 3,3425529 . 10^{-30} \text{Kg} \dots(1)$

The System Total- Harmonic-Charge $\equiv Q_T \equiv 2.q_d + q_u = 2.(-1/3).e + (2/3) e = 0 e$,
and the **System's – Resonance - Charge** $Q_T = 0 \text{C} \dots(2)$

Frequency of Unit-Cave is the Stationary-System becoming from Kepler second Planetary-law equation $4 \pi^2 m f^2_o = k$, and the constant law of Areas , $l = k . f^2_o . a^3$. Their common k , is the Constant-Energy

$$k = 4 \pi^2 m f^2_p = \frac{1}{f^2_p a^3} \text{ or } , f^4_p = \frac{1}{4 \pi^2 m a^3} \text{ and } f_p = \sqrt[4]{\frac{1}{4 \pi^2 m a^3}} , \text{ so}$$

the frequency becoming from this equal Resonance-Energy is the one Mass frequency and it is

$$f_{2u \rightarrow d} = \sqrt[4]{\frac{1}{4 \pi^2 m a^3}} = \sqrt[4]{\frac{1}{4 \pi^2 3,3425529 . 10^{-30} (5.10^{-19})^3}} = \sqrt[4]{606,25053 . 10^{80}} = 4,962072.10^{20} \text{H}$$

The System's Energy is $E_{2d \rightarrow u} = h . f_{2d \rightarrow u} = 6,62606957.10^{-34} . 4,962072.10^{20} = 32,879031.10^{-14}$
Joules / $1,6022.10^{-19} \text{C} = 20,521177.10^5 \text{eV} = \mathbf{2,0521177 \text{MeV} \dots\dots(3)}$

Lorentz Force $F = q . (\vec{v} \times \vec{B})$ shows that , + q charges turn Right while , - q charges turn Left .

The Magnetic-fields laws for Charges and Periods are, $T = \frac{2 \pi . m . T}{q . B_F}$, $\vec{B}_F = \frac{2 \pi . m . T}{q . T} = \frac{|2 \pi . m . T|}{Q_T} f$ so
 $\rightarrow \vec{B}_F = \frac{|2 \pi . m . T|}{Q_T} f_{2d \rightarrow u} = \frac{2 \pi [3,34255 . 10^{-30}] 4,962072.10^{20}}{1,6022.10^{-19}} (\text{Kg/Cs}) = \mathbf{409 . 10^9 \text{Tesla} \dots\dots(4)}$

From Energy-Relation $W = 2E = B w = J . w^2$, or $2E = 2 \pi f B$ then **Total -Spin*Frequency**
 $\vec{B} . f = \frac{E}{g}$, and $E = \bar{S} . g . f = 5,691952.10^{-34} \{ \text{Kg/m/s} \} . g . [4,962072.10^{20} \text{H}] / 1,6022.10^{-19} =$
 $17,289721.10^6 \text{eV} = \mathbf{17,289 \text{MeV} , i.e. The Energy produced from Total Spin-System .}$

From Planck's length $a = \sqrt[3]{k/f^2}$ then $k = a^3 . f^2$, and since **Energy** $E = k$ then Cave $a = \sqrt[3]{E/f^2}$
or **Action-Range** $a = \sqrt[3]{\frac{E}{f^2}} = \sqrt[3]{\frac{[17,289721.10^5]}{(4,962072.10^{20})^2}} = \sqrt[3]{7,0220166 . 10^{-36}} = 1,91493462.10^{-12} \text{m}$

The **Weak Forces** , $W^- Z^0$, in System is the Coulomb's Force $\rightarrow [d+d] > [d] \equiv [-\frac{2}{3} + \frac{1}{3} + W^- Z^0]$

which may be calculated from the Time needed , for Harmonic-mass to vibrate in cave r ,

$$\text{from Energy equation } r = \frac{m.v}{q.B} = \frac{[3,3425529.10^{-30} \text{ Kg}][2,9978.10^8]}{1,6022.10^{-19} [409.10^9]} = 1,52911.10^{-14} \text{ m} \dots(5)$$

and for Weak Forces , W^-Z^0 , in cave $d=10^{-14}$ m , then Period $T = \frac{d}{c} = \frac{1,52911.10^{-14} \text{ m}}{[2,998.10^8 \text{ m/s}]} =$

$$= 5,100773.10^{-23} \text{ s} , \text{ and The produced Energy in , } d , \text{ is } \rightarrow E_{W^-Z^0} = \frac{h}{T} = \frac{1,055.10^{-34} \text{ J.s}}{2.[5,100773.10^{-23} \text{ s}][1,6022.10^{-19} \text{ J/eV}]} = 6,4554113.10^6 \text{ eV} \equiv 6,455 \text{ MeV} \dots(6) \text{ and from Coulomb}$$

Force $F_C = \frac{C.Q}{r^2}$ and Voltage $V_C = \frac{C.Q}{r}$, then Force $[F_C] \times \text{Cave } [r] = \text{Voltage } [V_C] \rightarrow \text{so}$

$$\text{Weak-Forces } W^-Z^0 = \left[\frac{E_{W^-Z^0}}{r} \right] = \frac{6,4554.10^6}{1,52911.10^{-14}} = 4,22141.10^{20} \text{ eV} \dots(7) \text{ or from Weak-Forces}$$

$$W^-Z^0 \equiv \left[\frac{h/T}{2.r.B^2} \right] \equiv \left[\frac{h.c/d}{2.r.B^2} \right] \equiv \frac{h.c}{2.d.r.B^2} \equiv \left[\frac{h.c}{2.e.r.B^2} \right] \text{ eV} = \frac{1,055.10^{-34} \text{ J} [2,998.10^8 \text{ m/s}]}{2.[1,6022.10^{-19} \text{ eV}][1,52911.10^{-14} \text{ m}]^2} = 4,22141.10^{20} \text{ eV}$$

Since $[d \ d \ u]$ Summation occupy the **Zero-Constructive-Interference** therefore is Stable and Forces (W^-, Z^0) are equal and opposite as , $\rightarrow [W^- + Z^0 = 0] \equiv [\ominus \leftarrow \oplus \rightarrow \ominus] \leftarrow$

Composite - Reams $\pi^+ \equiv (+1|W^+)$, $\pi^- \equiv (-1|W^-)$, $\pi^0 \equiv 2.Z^0 \equiv 2\gamma$, and $p \equiv (+1|W^+Z^+)$

For 3-Combinations $\rightarrow [u \ u \ u] \equiv \left[+\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + W^+ \right] = \left[\frac{4}{3} + W^+ + \frac{2}{3} + W^+ \right] \equiv (+2|W^{++}) \equiv \Delta^{++}$ and $\{\pi^-\} + \{p\} \equiv (+1|W^+) + (+1|W^+Z^+) = (+2|W^{++}Z^+) = (+2|W^{++}[Z^+]) = (\Delta^{++}|Z^+)$

i.e. Δ^{++} Particle Decays to $\rightarrow \{\pi^+ + p\}$ through The-Destructive-Interference-Force $\rightarrow [Z^+]$.

For 3-Combinations $\rightarrow [d \ d \ d] \equiv \left[-\frac{1}{3} - \frac{1}{3} - \frac{1}{3} + W^- \right] \equiv (-1|W^{--}Z^0) \equiv (-1|W^{--}) + (0|W^-Z^0) \equiv \Delta^-$

For 3-Combinations $\rightarrow [e^- e^- e^-] \equiv [-1 -1 -1 + Z^0] \equiv (-2|W^{--} - 1) \equiv (-3|W^{--}W^-)$

For 3-Combinations $\rightarrow [v_e v_e v_e] \equiv [-0 -0 -0 + Z^0] \equiv (0|Z^0 - 0) \equiv (0|Z^0Z^0)$

For 3-Combinations $\rightarrow [s \ s \ s] \equiv \left[-\frac{1}{3} - \frac{1}{3} - \frac{1}{3} + Z^- \right] \equiv (-1|W^{--}Z^0) \equiv (-1|W^{--}) + (0|W^-Z^0) = \Omega^-$

For 3-Combinations $\rightarrow [d \ s \ s] \equiv \left[-\frac{1}{3} - \frac{1}{3} - \frac{1}{3} + W^- \right] \equiv (-1|W^{--}) \equiv (-1|W^{--}Z^0) \equiv \Xi^- \equiv \Omega^-$

1-i... Using above Reams , then All Elementary and Composite Particles are defined.

Charged- Pions $\rightarrow \pi^+ \equiv (-1|W^-) \equiv (-1|Z^-)$, $\pi^- \equiv (+1|W^+) \equiv (1|Z^0)$, $\pi^0 \equiv 2.Z^0 \equiv 2\gamma$,

Proton $\rightarrow p \equiv [u \ u \ d] \equiv (+1|W^+Z^+)$, **Stability is as** $> [\oplus \rightarrow \ominus \leftarrow \oplus]$

Neutron $\rightarrow n \equiv [d \ d \ u] \equiv (0|W^-Z^0)$, **Stability is as** $> [\ominus \leftarrow \oplus \rightarrow \ominus]$

Delta $\rightarrow \Delta^{++} \equiv (+2|W^{++}Z^+) \equiv (+1|W^+) + (+1|W^+Z^+) \equiv \pi^+ + p$

Delta $\rightarrow \Delta^+ \equiv [u \ u \ d]$, $\Delta^0 \equiv [u \ d \ d]$,

Delta $\rightarrow \Delta^{--} \equiv (-1|W^{--}Z^0) \equiv (-1|W^{--}) + (0|W^-Z^0) \equiv \pi^+ + n + Z^0$

Omega $\rightarrow \Omega^- \equiv (-1|W^{--}Z^0)$, $\Xi \equiv (-1|W^{--}) \equiv (-1|W^-Z^0)$

For 2-Combinations Pion $\pi^+ \rightarrow [u \ \bar{d}] \equiv \left[\frac{2}{3} + \frac{1}{3} + W^+ \right] \equiv (+1|W^+)$, **is Stable** .

For 2-Combinations Pion $\pi^- \rightarrow [d \ \bar{u}] \equiv \left[-\frac{1}{3} - \frac{2}{3} + W^- \right] \equiv (-1|W^-) = [\mu^+ \nu_\mu]$,

For 2-Combinations Pion $\pi^0 \equiv \pi^+ - \pi^- \equiv (+1|W^+) - (-1|W^-) \equiv (0|W^+W^-) \equiv (0|Z^+Z^-)$

For 2-Combinations Kaon $K^+ \rightarrow [u \ \bar{s}] \equiv \left[\frac{2}{3} + \frac{1}{3} + W^+ \right] \equiv (+1|W^+)$

For 2-Combinations Kaon $K^- \rightarrow [s \ \bar{u}] \equiv \left[-\frac{1}{3} - \frac{2}{3} + W^- \right] \equiv (-1|W^-)$

For 2-Combinations Kaon $K^0 \rightarrow [d \ \bar{s}] \equiv \left[-\frac{1}{3} + \frac{1}{3} + Z^0 \right] \equiv (0|Z^0)$

For 2-Composite Protons $p \rightarrow [p + p] \equiv (1|W^+Z^+) + (1|W^+Z^+) \equiv [e^+ \bar{\nu}_e \ z^+ + u \ \bar{d} \ z^+] \equiv [e^+ \bar{\nu}_e \ e^+ \nu_e + u \ \bar{d} \ u \ d] \equiv 2.e^+ + 2.\bar{u}$

For 2-Composite Neutrons $n \rightarrow [n + n] \equiv (0|W^-Z^0) + (0|W^-Z^0) \equiv (0|W^{--}Z^0)$

For 2-Composite Protons + Neutron $\rightarrow [n + p] \equiv (0|W^-Z^0) + (1|W^+Z^+) \equiv [e^+ e^- , e^+ \nu_e] \equiv e^+ \nu_e \equiv u \ \bar{u} \ e^+ \equiv e^+Z^0$

For 2-Composite Protons - Neutron $\rightarrow [n - p] \equiv (0|W^-Z^0) - (1|W^+Z^+) \equiv [u \ u \ d - d \ d \ u = u \ u + d \ \bar{d} + d \ \bar{u}] \equiv Z^0 + Z^0 + (-1|W^-) \equiv \bar{\nu}_e + e^- \equiv W^-$

For 1-Composite Anti-Protons $\bar{p} \rightarrow \bar{p} \equiv -p = -[d \ d \ d] \equiv [\bar{d} \ \bar{d} \ \bar{d}] \equiv \left[\frac{1}{3} + \frac{1}{3} + W^+ \frac{2}{3} W^+ \right] \equiv$

$\left(1|W^+ + \frac{1}{3}|W^+ \right) = [e^+ \nu_e + u \ d \ Z^+] \equiv (1|Z^+) + (0|Z^+) + u + d \equiv (1|Z^{++}) + u + d$, **and is Stable**

$$\begin{aligned}
 \text{Delta} \rightarrow \Delta^+ &\equiv [u u d] \equiv \left[\frac{2}{3} + \frac{2}{3} - \frac{1}{3} + W^+ Z^+ \right] \equiv (1 | W^+ Z^+) = (1 | W^+) - (0 | Z^+) \\
 &\equiv p - Z^+ + (0 | Z^+) \equiv p + (0 | Z^+ Z^-) \equiv p + (0 | Z^0) \equiv \mathbf{p} + \boldsymbol{\pi}^0 - Z^0 \\
 \text{Delta} \rightarrow \Delta^{--} &\equiv [d d d] \equiv \left[-\frac{1}{3} - \frac{1}{3} - \frac{1}{3} + W^- W^- \right] \equiv (-1 | W^-) + (0 | W^-) \equiv \boldsymbol{\pi}^- + \mathbf{n} - Z^0 \\
 \text{Delta} \rightarrow \Delta^0 &\equiv [u d d] \equiv \left[\frac{2}{3} - \frac{1}{3} - \frac{1}{3} + Z^+ Z^0 \right] \equiv (0 | Z^+ Z^0) = (0 | Z^+) + (0 | Z^0) \equiv \\
 &\equiv n - (0 | W^-) + (0 | Z^+) = n + (0 | W^+) + (0 | Z^+) = \\
 &\equiv n + (0 | Z^+) - (0 | W^-) \equiv \mathbf{n} + \boldsymbol{\pi}^0 - (0 | W^-) \text{ decays to } \rightarrow \mathbf{n} + \boldsymbol{\pi}^0 \\
 \text{Alfa-Decay} \rightarrow \alpha^+ &\equiv [p p + n n] \equiv [p n + p n] \equiv e^+ \nu_e + e^+ \nu_e \equiv (+2 | \nu_e) \equiv \frac{4}{2} \text{ He} \\
 \text{Muon-Decay} \rightarrow \mu^- &\rightarrow [\mu^- - e^-] = [+1 - 1 + Z^0] = \nu_\mu + \bar{\nu}_e = \bar{\nu}_e \text{ or } \rightarrow \mu^- \equiv e^- + \nu_\mu + \bar{\nu}_e \\
 \text{Beta-Decay} \rightarrow \beta^+ &\rightarrow [n - p] \equiv [e^- + \bar{\nu}_e] - [e^- + \bar{\nu}_e] \equiv Z^- + (1 | Z^0) \equiv (-1 | Z^0 Z^-) \equiv e^- \text{ or} \\
 \text{Beta-Decay} \rightarrow \beta^+ &\rightarrow n \equiv p + e^+ \text{ or } \rightarrow e^- + n \rightarrow p
 \end{aligned}$$

$$\begin{aligned}
 \text{Gamma-Radiation} \rightarrow \gamma &\equiv \frac{0}{0} \gamma \equiv 2\pi E_N \equiv \text{Energy of Electron-Nutation in Unit-circle} \equiv 2\pi [h.f_N] \equiv \\
 &\equiv 2\pi \cdot 1.66261 \cdot 10^{-34} \cdot 2,8398 \cdot 10^{10} / 1,6022 \cdot 10^{-19} \equiv 7,379 \cdot 10^6 \text{ eV} \equiv \mathbf{7,38 MeV}
 \end{aligned}$$

$$\text{Nucleus-Emits } e^+ + 2 \nu_e \equiv 1 + 0 | Z^0 + 0 | Z^0 \equiv 1 | Z^0 + 0 | Z^0 \equiv -e^- + (\bar{\nu}_\mu \nu_\mu) \equiv -e^- \text{ is absorbed}$$

$$\text{Nucleus-Emits(+)} 2 \nu_e \equiv 0 | Z^0 + 0 | Z^0 \equiv -e^- + 0 | Z^0 \equiv -e^- + 2 \nu_e - e^- \equiv -2e^- + 2 \nu_e \text{ and}$$

$$\text{Nucleus-Emits(+)} 2 \nu_e \text{ and Absorbs (-) 2-electrons i.e. issues, 1- Emit } \leftrightarrow \text{1- Absorb.}$$

$$\begin{aligned}
 \text{Atoms-Decay} \rightarrow &\text{From the Atom's Construction (Page - 36) are seen the Positions for} \\
 &\text{Equilibrium, } \boldsymbol{\alpha} - \text{Structure}, \text{ therefore Decay exists on Neutrons, } n = [d d u] \\
 &\text{and for each Decay } \gg \boldsymbol{\alpha} - \mathbf{D} \rightarrow (+2 | \nu_e) \equiv \frac{4}{2} \text{ He}, \boldsymbol{\beta} - \mathbf{D} \rightarrow n = p + e^+, \boldsymbol{\gamma} - \mathbf{D} \rightarrow \frac{0}{0} \gamma \\
 &\text{For Uranium issues } {}^{238}_{92} \text{ U} \equiv \frac{4}{2} \text{ He} + {}^{234}_{90} \text{ U} + 2 \cdot \frac{0}{0} \gamma, \text{ where 92 is Atomic-Number} \\
 &\text{Mass-Number } 238 = 92 + 92 + 54 \text{ Neutrons. A further analysis in [91].}
 \end{aligned}$$

Remarks :

a... The **Elementary Forces** become from the **Action** between the two, $[\oplus \leftrightarrow \ominus]$, Charges. Because this action is transformed to Motion, **Vibration**, in the **RLC** $\equiv$ **STPL** Physical-Rotor, Therefore occupies, Reaction to this motion, **mass**, and Period, **Frequency**, which this is an **Electromagnetic-Wave** . i.e. **The Elementary Forces** $\equiv$ **Electromagnetic Waves** .

b...For Elementary Forces and Particles issues $\rightarrow$ The WHERE, HOW and WHEN, All above Happen $\leftarrow$ and The Systems these follow, in order to Occupy this Different Energy-Quantization

The Mechanism of Composite Particles Genesis in Energy-Voltage

For Deuterium ${}^2_1\text{H} \equiv \mathbf{p} + \mathbf{n} \equiv (+1|\mathbf{W}^+\mathbf{Z}^+) + (0|\mathbf{W}^-\mathbf{Z}^0) \equiv \mathbf{p} + (0|\mathbf{W}^-\mathbf{Z}^0) \equiv \mathbf{p} + (0|\mathbf{W}^-) + (0|\mathbf{Z}^0) \equiv \mathbf{p} + [\nu_e \bar{\nu}_e] + [\nu_e + \bar{\nu}_e] \equiv \mathbf{p} + 3.\nu_e + \bar{\nu}_e \equiv \dots\dots(\text{D})$
 Initial $\mathbf{D} = {}^2_1\text{H} \equiv \mathbf{p} + \mathbf{n} \equiv (1|\mathbf{W}^+\mathbf{Z}^+) + (0|\mathbf{W}^-\mathbf{Z}^0) = (\mathbf{1}|\mathbf{Z}^+\mathbf{Z}^0) = (1|\mathbf{Z}^+) + (0|\mathbf{Z}^0) = [e^-\bar{\nu}_e] + [e^-e^+] = 2e^+e^- + [\bar{\nu}_e] = 2e^+ + [e^- + \bar{\nu}_e] = 2e^+ + (-1|\mathbf{Z}^-) \dots\dots(\text{D})$
 From relation ${}^2_1\text{H} \equiv (1|\mathbf{Z}^+\mathbf{Z}^0) \Rightarrow 0$ is seen that Deuterium is an Stable-System although its bound is Weak. The Relation $\mathbf{p} \equiv (1|\mathbf{W}^+\mathbf{Z}^+)$ shows that W - Boson is the only force via which Particles can transform. In Hydrogen cave, Voltage = $\frac{k.e^2}{r}$ eV, and for Deuterium $V_{\mathbf{p}+\mathbf{n}} = \frac{[9.10^9].[1.6022.10^{-19}]^2}{1.0.10^{-15}.[1.6022.10^{-19}]} = 14,42.10^5 \text{ eV} = 1,442 \text{ MeV}$ which is the Resonance Voltage.
 i.e. in order to shift the Nucleons of a Deuterium into a Proton Spin-pair, would require an extra input of 1,442 MeV, so **Proton Paired with a Neutron is Stable**.
 The **Proton's** Charge distribution is all Positive as $\mathbf{p} \equiv [\mathbf{u} \mathbf{u} \mathbf{d}] \equiv (+1|\mathbf{W}^+\mathbf{Z}^+)$, while the Neutron's $\mathbf{n} \equiv [\mathbf{d} \mathbf{d} \mathbf{u}] \equiv (0|\mathbf{W}^-\mathbf{Z}^0)$

2-i... The Stability of the Composite Particles in Energy-Voltage :

From Coulomb-Energy equations issues, **Force** $[F_C] \times \mathbf{Cave} [r] = \mathbf{Voltage} [V_C]$ because Force $F_C = \frac{C.Q}{r^2}$, Voltage $V_C = \frac{C.Q}{r}$, meaning that Voltage, *Potential Energy*, in a cave defines the Strength of the Force included, since Gravitational constant, *the Newton's-Force*, is, $G \equiv \Phi^2. [\{\sigma \Phi\} \equiv 2\pi f_p r \equiv \frac{2B}{\pi r^3} \equiv w r \equiv \bar{v} \equiv m a \equiv m g \equiv \bar{c}]$ can be expressed in all Spectrum.
 Voltage $V_C \equiv \int_{\infty}^r \frac{q_1 q_2}{4\pi \epsilon . r^2} = \frac{q_1 q_2}{4\pi \epsilon . r}$ while Force $F = \frac{q_1 q_2}{4\pi \epsilon . r^2}$ and $V_C \equiv r F_C \dots\dots(\text{q})$ i.e. In any cave, r , exists a Voltage V_C , and in which Voltage exists a Force F_C .

From Mechanics Motion $\equiv \mathbf{Energy} E = \frac{mv^2}{2}$ is dependent on mass and velocity-squared and equal to Coulomb equation, $E = q V_C$ dependent on Charge, q , and Voltage of Area or Volume. Equating the Energy then $E = \frac{mv^2}{2} = q V_C = h f = \frac{h}{T} = \frac{h}{r/v} = \frac{h}{2\lambda/v} = \frac{h.v}{2\lambda} = \frac{h.v}{4r}$, and $\rightarrow m v = \frac{h}{2r}$, $v = \frac{h}{2.m.r} = \frac{h}{m.\lambda} \dots(1)$ and Voltage $V_C = \frac{mv^2}{2.q} \dots\dots(2)$. Placing (1) to (2) then becomes, $V_C = \frac{mv^2}{2.q} = \frac{m.h^2}{2m^2.\lambda^2.q} = \frac{m.h^2}{2q.m.\lambda^2} = \frac{h^2}{2.q.m.\lambda^2}$, or Voltage $V_C = \frac{h^2}{2.q.m.\lambda^2} = \frac{v.h^2}{4q.s.r^2}$, related to the inverse squared cave and Spin, or from Charge and mass.

Example 1 : For $q = e = (1,602.10^{-19} \text{ C})$, $m_p = 3,3425529.10^{-30} \text{ Kg}$, and wavelength $\lambda = 2r = 6.10^{-12} \text{ m}$, then Velocity of Proton $v_p = \frac{h}{m.\lambda} = \frac{6,626.10^{-34} \text{ J.s}}{3,3425529.10^{-30}.[6.10^{-12}]} = 0,3303861.10^8 = 3,303861.10^7 \text{ m/s}$, a velocity near light velocity.
 Voltage of Cave is equal to the Kinetic Energy of Proton, $V_p = \frac{3,3425529.10^{-30}.[3,964634.10^7]^2}{2.[1.6022.10^{-19}]} = 1,1386102 \text{ Volt}$,
 or the **Same - Result** from $V_p = \frac{h^2}{2.q.m.\lambda^2} = \frac{[6,626.10^{-34}]^2}{2[1.6022.10^{-19}][3,3425529.10^{-30}][6.10^{-12}]^2} = 1,13861 \text{ Volt}$.

Example 2 :

During Binding and because the Wavelength of Particles in caves changes inversely to the velocity, so occupies Lower values when reaching light velocity, therefore its Energy increases and becomes greater than that of the Voltage, **it is an Unstable-cave**, in Cave and when it is equal then overflows and becomes an **Radioactive cave**. Measuring this Potential of caves by using light-velocity, c , in Planck's-Energy-equation, becomes $c = \frac{h}{m.\lambda}$, and $m = \frac{h}{c.\lambda}$ so from Energy $\rightarrow E = \frac{mc^2}{2} = q V_C = \frac{h}{c.\lambda} [\frac{c^2}{2}]$, or $V_C = \frac{h}{2.q.\lambda} [\frac{c}{1}] = \frac{h.c}{2.q.\lambda}$, and Voltage is $V_C = \frac{6,626.10^{-34}.[2,998.10^8]}{2.[1.6022.10^{-19}][6.10^{-12}]} = 1,0332016.10^5 \text{ Volts}$, i.e. **increases 10^5 times**.

With this way, the starting energy E , in Voltage, qV_C , is converted to the final form $h f$, and is an **Stable-System** of an accelerated single elementary charge like that of electron or composite Proton, through a Potential given in Volts then their Energy in eV, have the same numerical value. Thus 50-kV Potential generates 50 keV electrons which in turn can Produce Photons with a maximum Energy of 50keV. This **accelerating-Potential** happens because of the Voltage increasing.

Equating the Lorentz-Force and the Nutation-Force in a Cave which is $\equiv$ The Magnetic-field, then becomes

$\rightarrow \mathbf{Charge-Force} \quad \mathbf{Q}_+ = \bar{q} \mathbf{f} = [\frac{g.S}{2\pi r^2}] \leftarrow$ which originates the $[\oplus]$ Forces as,

a).. **Lorentz-Force** $\rightarrow \mathbf{F}_L = \bar{q} \bar{\mathbf{v}} \times \bar{\mathbf{B}}_F = 2\pi.\bar{q}.\bar{v}.[\frac{f=1}{g}] \leftarrow$ where Magnetic-Field-Strength $\bar{\mathbf{B}}_F = [\frac{2\pi.m}{Q_+}].\mathbf{f}$

b).. **Nutation-Force** $\rightarrow \mathbf{F}_N = \left[\frac{\bar{v}S}{r^2} \right] \leftarrow$ where Spin S , is that in , r cave . Equating

$$\mathbf{F}_L = \bar{q}\bar{v}\mathbf{x}\bar{B}_F = 2\pi.\bar{q}\bar{v}.\left[\frac{f=1}{g}\right] = \mathbf{F}_N = \left[\frac{\bar{v}S}{r^2}\right], \text{ from where issues } \rightarrow \text{Charge-Force } \mathbf{Q}_+ = \bar{q}\mathbf{f} = \left[\frac{g.S}{2\pi r^2}\right] = \frac{g.S}{r.f}$$

It was shown [82] that Monads $\equiv$ Quaternions consisted of the Real and Imaginary-Part as equation ,
 $\mathbf{z}^{1/w} = [s + \bar{v}\nabla i]^{1/w} = |\mathbf{z}_0|^{-w} \cos(\varphi + 2k\pi)/w + i.\sin(\varphi + 2k\pi/w) \equiv |\mathbf{z}_0|^{-w} \cdot \mathbf{e}^{-i.(\varphi+2k\pi).wt} \equiv$
 $|\mathbf{z}_0|^{-w}.\cos(\varphi+2k\pi) + i.|\mathbf{z}_0|^{-w}.\sin(\varphi+2k\pi) \equiv \mathbf{x} + i.\mathbf{y} \dots\dots\dots(a)$
 where $\mathbf{z}^w$ = The Space , and $\mathbf{z}^{1/w} = \mathbf{z}^{-w}$ The Anti-Space of Monad $\equiv$ Quaternion $\overline{AB}$.

Above equations define the , Wave-Nature , of monads in all Levels and Sub-levels .

From above monads $(s + \bar{v}\nabla i)^{1/w} = |\mathbf{z}_0|^{-w} \cdot \mathbf{e}^{-i.(\varphi+2k\pi).w}$, where $\cos \varphi = s / |\mathbf{z}_0|$ and for the
Rotated Energy case $\equiv$ The Spin , where $s = 0$ and $\cos \varphi = 0$, exists for angle , $\varphi = \pi/2$, and the
 Quaternion $(s + \bar{v}\nabla i)^{1/w}$ **as dimension Power** $\rightarrow w = \mathbf{b} \leftarrow$ and for $\mathbf{k} = 1$ becomes ,
 $\mathbf{e}^{-i.(\pi/2+2k\pi).w} = \mathbf{e}^{-i.(\pi/2+2k\pi).b} = \mathbf{e}^{-i.(5\pi/2).b} = \mathbf{e}^{-i.(5\pi/2).10} \dots\dots\dots(b)$

Equation (b) fits , **as minimum** , in the Planck length and is $\mathbf{L}_p = \mathbf{e}^{-i.(5\pi/2).10} \dots\dots\dots(c)$

Equation (c) is the smallest , **Energy-Unit of Space** , and this because of $s = 0$ and $\mathbf{k} = 1$

It was shown [31] that 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 , $b = 10$.
 From $\rightarrow \mathbf{z}^{1/w} = (s + \bar{v}\nabla i)^{1/w} = |\mathbf{z}_0|^{-w} [\cos(\varphi + k\pi)/w + i.\sin(\varphi + k\pi)/w] = |\mathbf{z}_0|^{-w} \cdot \mathbf{e}^{-i.(\varphi+k\pi).w}$

where for $\cos(\varphi + k\pi) / w = 0$ exists only the **Imaginary-Part** of monad , $(\mathbf{v} \cdot \nabla i) \neq 0$, where $\varphi = \pi/2$,
 and then $\rightarrow \mathbf{z}^{1/w} = |\mathbf{z}_0|^{-w} \cdot \mathbf{e}^{i.(\varphi+k\pi)/w} = \mathbf{e}^{-i.(\frac{\pi}{2}+k\pi).10}$ which it is the **Diffraction Energy mechanism**

while for **minimum-Space** $\mathbf{r} = \mathbf{e}^{-i.(\frac{\pi}{2}).b} = 0$, 207879576.b = 1,507019.10⁻⁷ m

for all Space Levels of quantization and which are , **The Energy - Particles only**

i.e. The Energy Particles in Stationary caves as $\mathbf{z}^{1/w} = |\mathbf{z}_0|^{-w} \cdot \mathbf{L}_v = \text{Energy Monads}$.

Extending Quantization of Energy according to exponential formula , $\mathbf{L}_v = \mathbf{e}^{-i.(5\pi/2).10}$, on the
 decimal base $b = 10$ then for , $k = \pm 1 \rightarrow \pm \infty$, are found the Energy caves as

For base $e = 2,71828$ and base $b = 10$ then $e^{-(15,707963)} = 1,507 \cdot 10^{-7}$ m
 which is the Space-Part as $\rightarrow \mathbf{L}_s = \mathbf{e}^{i.(-\pi).b} = \mathbf{e}^{-i.(-31,41593)} = 2,27110104 \cdot 10^{-14}$ m
 For base $e = 2,71828$ and base $b = 10$ then $e^{-(47,123889)} = 3,42259 \cdot 10^{-21}$ m
 For base $e = 2,71828$ and base $b = 10$ then $e^{-(62,831853)} = 5,15790 \cdot 10^{-28}$ m
 For base $e = 2,71828$ and base $b = 10$ then $e^{-(78,5398)} = 7,7730546 \cdot 10^{-35}$ m
 or $e^{-(78,5398)} = 8,906 \cdot 10^{-35}$ m = $\{ \sqrt{3}.\pi.1,616199 \cdot 10^{-35} \text{ m} \} \equiv \mathbf{L}_p = \text{Planck's Length}$

For base $e = 2,71828$ and base $b = 10$ then $e^{-(109,95574)} = 1,76534 \cdot 10^{-48}$ m

For base $e = 2,71828$ and base $b = 10$ then $e^{-(141,37166)} = 4,00929 \cdot 10^{-62}$ m

i.e. The **minimum Energy-cave** for the **Primary-Particles** is that of 10^{-21} m while

The **maximum Energy-cave** for the **Primary-Particles** is that of 10^{-11} m , and

The **minimum - 1D-Space-cave** for the **Primary-Particles** is that of $1,507 \cdot 10^{-7}$ m

The **minimum - 2D-Space-cave** for the **Primary-Particles** is that of $2,271 \cdot 10^{-14}$ m

The **minimum - 3D-Space-cave** for the **Primary-Particles** is that of $3,423 \cdot 10^{-21}$ m

or the 3D-cave $\rightarrow 1.10^{-16}$ m , in where The **Strong and Weak- Forces Converge to**

one value $\rightarrow 10,65 \cdot 10^{25} \text{ eV} \equiv 10,65 \cdot 10^{16} \text{ GeV}$, meaning that Forces are

Quantized in their Energy-Caves which are Energy-monads , where issues ,

Weak - force is Charge-Force as $\mathbf{Q}_+.r = \left[\frac{g.S}{2\pi r^2} \right] < 1.10^{17} \text{ GeV}$ for amplitude $\mathbf{r} \rightarrow 10^{-16} < r < 10^{-11}$ m

Strong - force is Charge-Force as $\mathbf{Q}_+.r = \left[\frac{g.S}{2\pi r^2} \right] > 1.10^{17} \text{ GeV}$ for amplitude $\mathbf{r} \rightarrow 10^{-21} < r < 10^{-16}$ m

Strongest-force is Charge-Force as $\mathbf{Q}_{++}.r = \left[\frac{g.S}{2\pi r^2} \right] = 1.10^{22} \text{ GeV}$ for amplitude $\mathbf{r} \rightarrow 10^{-27} < r < 10^{-21}$ m

Example 3

Hydrogen - CAVE $\rightarrow$ 1-Proton $[\oplus]$, 1-Electron $[\ominus]$, 1-Neutron $[\oplus \cup \cup \ominus] - [\oplus \leftrightarrow \ominus]$

Hydrogen is $\rightarrow [p n e] \equiv \left[\frac{3}{3} + 0 - \frac{3}{3} + W^+ \right] \equiv (0 | W^+ Z^0) = \text{One Proton and One Electron}$.

Interaction of Proton and Electron is $\rightarrow p e \equiv \left[+\frac{3}{3} - \frac{3}{3} + W^+ Z^0 \right] \equiv \sum_{e \rightarrow} [N_p + N_e]$ and the Summation

of the Nucleus-Charges $[p + n]$ of Cave N^{p+n} , **attacks** $\Rightarrow$ the Electron $[e = -1]$ of Cave $H_{N^{p+n}}$
 creating Destructive-Interference $[\oplus \cup \ominus = 0] \equiv [+1 - 1 + Z^0]$ or , $CI_{\frac{+}{-}} \equiv [1|W^+] + DI_{\frac{+}{-}} \equiv Z^0$

and $\rightarrow [p n e] \equiv (0 | W^+ Z^0) = -8,72 \cdot 10^{-20} \text{ J} = -5,45 \cdot 10^{-1} \text{ eV} = -0,545 \text{ eV}$.

The Process from measurements ,

1... DATA .

$$\begin{aligned} \text{From } m_p &= \text{Resonance } M_{Tp} = 3,1458799.10^{-30} \text{ Kg} , \\ m_{N-E} &= 0,511 \text{ eV} = 0,511.[1,7826614.10^{-36}] = 9,109399.10^{-35} \text{ Kg} \\ m_n &= \text{Resonance } M_{Tn} = 3,3425529.10^{-30} \text{ Kg} \end{aligned}$$

$$\begin{aligned} \text{The Atoms Total-Harmonic mass } M_A \text{ is } \rightarrow \frac{1}{M_A} &= \frac{1}{m_p} + \frac{1}{m_n} + \frac{1}{m_e} = \frac{10^{30}}{3,146} + \frac{10^{30}}{3,343} + \frac{10^{35}}{9,109} = \frac{10^{31}}{31,46} + \frac{10^{31}}{33,43} + \frac{10^3.10^{31}}{0,9109} \\ &= \frac{105,17078.10^{35}}{958} = 9,10899.10^{-35} \text{ Kg} , \text{ which is the Total-mass } M_{N-E} = 9,10899.10^{-35} \text{ Kg} \dots\dots(1) \end{aligned}$$

$$\begin{aligned} \text{The Total-Harmonic - Nucleus-Charge } &\equiv Q_T \equiv q_p \pm 0 = 1,6022.10^{-19} = 1,6022. 10^{-19} \text{ C} \\ \text{and the System's - Resonance - Charge } &Q_N \equiv 1,6022. 10^{-19} \text{ C} \dots\dots\dots(2) \end{aligned}$$

The frequency of the Closed-Nucleus-Orbit-System becomes from Kepler second Planetary law equation $4 \pi^2 m f_o^2 = k$, and the constant law of Areas $l = k . f_o^2 . a^3$. Their common k , is the Constant-Energy $\rightarrow$

$$k = 4 \pi^2 m f_o^2 = \frac{1}{f_o^2 a^3} \text{ or } , f^4 = \frac{1}{4 \pi^2 m a^3} \text{ and } f = \sqrt[4]{\frac{1}{4 \pi^2 m a^3}} \dots\dots(f)$$

With this way , **Impedance** $\equiv$ **Resistor** and $w_0 = 1$, the Resistor in the System is unaffected by the frequencies of Inductive and Capacitive Reactance and the Total-Resistance becomes as the above

mass $m = M_T = 9,10899.10^{-35} \text{ Kg}$. The **Resonance-Cave-frequency** is as (f) ,

$$f = \sqrt[4]{\frac{1}{4 \pi^2 m a_H^3}} = \sqrt[4]{\frac{1}{4 \pi^2 9,10899.10^{-35} (2,1145016.10^{-11})^3}} = \sqrt[4]{2,941347. 10^{64}} = 1,3095936.10^{16} \text{ H} \dots\dots(3)$$

Coulomb-law issues between Nucleus and orbit diameter **Charges** $d = 10^{-10} \text{ m}$, while Newton's-law issues for all **masses** between Nucleus and Nucleus-Orbit as electron cave $d = 10^{-14} \text{ m}$.

The System M_{N-E} = masses , Q_N = Nucleus-Charges creates the constant Magnetic-field

$$\bar{B}_F = \left| \frac{2 \pi . M_T}{Q_T} \right| f = \frac{2 \pi . 9,10899.10^{-35} . [1,3099329.10^{15}]}{[1,6022.10^{-19}]} \text{ (Kg/C.s)} = 46,793163 \text{ Tesla} \dots\dots(4) \text{ i.e.}$$

$\bar{B}_F = 46,793163 \text{ Tesla} \rightarrow$ **Is the Strength in an High-Magnetic-Laboratory** ,
since 1Tesla = [N.s/C. m] = [N/Ampere .m] = [Kg /C.s] = 10^4 Gauss = 10^{-9} Mega-Tesla .

$$\begin{aligned} \text{Resonance-Cave } a &= \sqrt[3]{T^2/g} = \sqrt[3]{1/g f^2} = \sqrt[3]{1/g [1,3095936. 10^{16}]^2} = \sqrt[3]{0,594136. 10^{-33}} \\ &= 8,401675854.10^{-12} \text{ m} , \text{ and the Resonance-Energy } E = \frac{1}{a^3} \left[\frac{4 \pi^2}{c^2} + \frac{L^2}{2m} \right] , \text{ where} \end{aligned}$$

$$\begin{aligned} L &\text{ is the Spin } S = 5,691952. 10^{-34} \text{ {Kg/m/s}} , \text{ System-mass } M_{N-E} = 9,10899.10^{-35} \text{ Kg} , \\ c &\equiv 2,998.10^8 \text{ m/s} . \text{ and energy } E = [1,4166682.10^{22}] \times [4,3923448.10^{-16} + 1,7783703.10^{-33}] = \\ &6,2224952.10^6 \text{ J} + 2,5193606.10^{-11} \text{ J} \rightarrow 3,8837193.10^{25} \text{ eV} + 1,5724382.10^{-30} \text{ J} \dots\dots(E) \end{aligned}$$

The **Strong Forces** , W^+Z^0 , in the System **Hydrogen** [p n e] $\equiv [\frac{3}{3} + 0 - \frac{3}{3} + W^+] \equiv (0 | W^+Z^0)$
which may be calculated from the Time needed , for Harmonic-mass to vibrate in cave **r** , and from

$$\text{Energy equation } r = r_B = \left[\frac{m.v}{q.B} \right] = \frac{[9,10899.10^{-35} \text{ Kg}] [2,9978.10^8]}{1,6022.10^{-19} . [46,793163]} = 3,642283.10^{-9} \text{ m} \dots\dots(5)$$

$$\text{Also for Strong Forces } , W^+Z^0 , \text{ in cave } d = 10^{-9} \text{ m then Period } T = \frac{d}{c} = \frac{3,642283.10^{-9} \text{ m}}{[2,998.10^8 \text{ m/s}]} =$$

$$1,2149042.10^{-17} \text{ s} , \text{ and The produced Energy in Hydrogen cave } d , \text{ is } \rightarrow E_{W^+Z^0} = \hbar / T =$$

$$= \frac{1,055.10^{-34} \text{ J.s}}{2 . [1,2149.10^{-23} \text{ s}] . [1,602.10^{-19} \text{ J/eV}]} = 0,2709965. 10^2 \equiv 27, 10 \text{ eV} \dots\dots(6) \text{ and from Coulomb}$$

$$\text{Force } F_C = \frac{C.Q}{r^2} \text{ and Voltage } V_C = \frac{C.Q}{r} , \text{ then } \rightarrow \text{Force } [F_C] \times \text{Cave } [r] = \text{Voltage } [V_C] \leftarrow \text{so}$$

$$\text{Nucleus-Forces } W^+Z^0 = \left[\frac{E_{W^+Z^0}}{r} \right] = \frac{27,09965}{3,642283.10^{-9}} = 7,4402922.10^{-9} \text{ eV} \dots\dots(7) \text{ or Strong-Forces}$$

$$W^+Z^0 \equiv \left[\frac{\hbar / T}{2 . r_B^2} \right] \equiv \left[\frac{\hbar . c / d}{2 . r_B^2} \right] \equiv \frac{\hbar . c}{2 . d . r_B^2} \equiv \left[\frac{\hbar . c}{2 . e . r_B^2} \right] \text{ eV} = \frac{1,055.10^{-34} \text{ J} . [2,998.10^8 \text{ m/s}]}{2 . [1,602.10^{-19} \text{ J/eV}] . [3,642283.10^{-9}]^2} = 7,4403.10^{-9} \text{ eV}$$

Neutron **n** $\equiv (0 | W^-Z^0)$ with Zero Charge , when is found in a Voltage $V_r = F_c . r$, Then is executed on it the Weak Forces $(0 | W^-Z^0) = - 7,4403.10^{-9} \text{ eV}$, meaning that Displacement $\Delta_{Z^0} = 1,48858. 10^{-8} \text{ m}$, is the Weak-force-Range for Neutrons . From relation $\bar{q} = i.T$,

$$\text{Current } i , \text{ is the Resonance-Charge } Q_N = i = \frac{\text{Charge}}{\text{Time}} = \frac{\bar{q}}{T=1} \equiv 1,6022. 10^{-19} \text{ C}$$

$$\text{Electromotive-Force EMF} = \frac{\text{Energy}}{\text{Charge}} = \text{Voltage } V = \frac{E}{q} , \text{ and Energy } E = \bar{q} . V = V . i . T$$

$$\text{EMF} = W^+Z^0 = 7,4402922. 10^{-9} \text{ eV} \equiv [q = 1,6022. 10^{-19} \text{ C}] . [V = 4,6437974.10^{10} \text{ Ampere}]$$

$$\text{Power } P = \frac{\text{Energy}}{\text{Time}} = V . i = 4,6437974.10^{10} \text{ J/T} = A \times 1,6022.10^{-19} \text{ C} = 7,4402922. 10^{-9} \text{ eV} \equiv \text{J/s} = \text{Watt}$$

The same for Gravitational constant $G \equiv \Phi^2$. $[\{\sigma \Phi\} \equiv 2\pi f_p r \equiv \frac{2B}{\pi r^3} \equiv w r \equiv \bar{v} \equiv ma \equiv m g \equiv \bar{c}]$

3-i... The Periodic motion in all Displacements

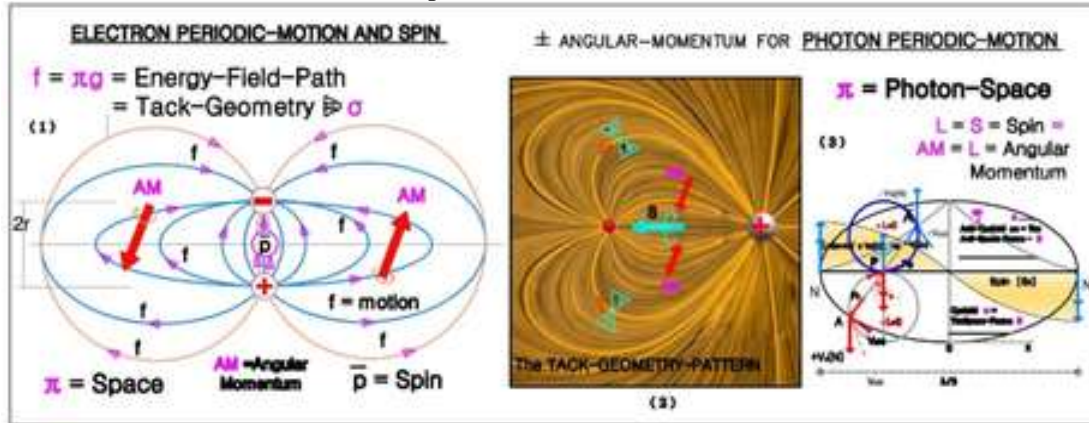


Figure – 35- : The Two Possible motions in caves , The Periodic and The Rotational :

In (1) .Is formatted the Energy-Space of the **Orbital-Periodic-motion** $[\oplus \leftrightarrow \ominus]$ in **Tack-Geometry-Pattern**

and (2) formulation , where Hydrogen minimum cave , a is $a = \sqrt[3]{\frac{1}{k \cdot f^2}} = \sqrt[3]{\frac{1}{g \cdot f^2}}$, and for Constant energy $k = g$,
 $f = E / h = 13,6 \text{ eV/h} = \text{Unit-Energy-Space-frequency}$ or $f = 3,28393 \cdot 10^{15} / \text{s}$, of cave $a = 2,1127839 \cdot 10^{-11} \text{ m}$

From Linear-Periodic-motion $\frac{w_n}{2\pi} = f_e = \frac{1}{2\pi} \sqrt{\frac{k}{m}}$, or $4 \pi^2 f_e^2 \cdot m_e = k = \pi g$, then for Electron $m_e = \frac{g}{4 \pi f_e^2}$

so , electron mass is $m_e = \frac{g}{4 \pi f_e^2} = \frac{9,808238}{4 \cdot \pi \cdot [3,28399 \cdot 10^{15}]^2} = 7,2373149 \cdot 10^{-32} \text{ kg}$, $f_e = 3,283998 \cdot 10^{15} / \text{s}$,

The Spin-Cave is equal to The Moment of couple from two , $\uparrow \leftrightarrow \downarrow$, Angular-momentum Vectors as ,

$\vec{B} = a m v = 2,1127839 \cdot 10^{-11} \text{ m} \cdot 7,2373149 \cdot 10^{-32} \text{ kg} \cdot 2,99798 \cdot 10^8 = 4,5841758 \cdot 10^{-34} / \pi$, and
 Spin $\rightarrow S/2 = 1,4591885 \cdot 10^{-34}$ which is the **Electron-Spin**.

The $k = \pi g$, denotes the , $\oplus$ **Space** $\equiv$ Electric-field in-where exist the Electric-lines the tracks for the motion of electrons $\ominus$ the **Anti-space** . The Right Angular momentum Vector , $AM \equiv \uparrow$, is the Produced **Work and is stored in Magnetic-field as motion** while left-vector , $AM \equiv \downarrow$, is the Produced Work and is stored in the Opposite Magnetic field as motion and both consist the **Dipole-vector** $\rightarrow [\oplus \cup \ominus] \leftarrow$ directed as $[\oplus \rightarrow \ominus]$

and it is that we say **Tack-Geometry** . For Quantum-Energy equal to g , then $k = g$, and $\rightarrow a = \sqrt[3]{\frac{1}{k \cdot f^2}} = \sqrt[3]{\frac{h^2}{k \cdot E^2}}$,

or Magnetic-Cave $a_m = \sqrt[3]{\frac{h^2}{g \cdot E^2}}$, and is the corresponding cave a for Energy-monads ,

In (2) .Is formatted the Energy-Space of M-P vibration of opposites which creates a wave which has an Electric , E , and an Magnetic component , H , Perpendicular each other and is as $[E^2 + H^2] = 2 \cdot (2r) \cdot c \cdot \sin 2\varphi$ on where **does Not-exists the Skin-effect** and this because of the Laplace $\nabla^2 f = 0$ equation issuing in ,**Tack-Geometry**.

The Property of Periodic-motion in M-P is that conserves **The Inner-Magnetic-Wave** , into the Centre of mass Charges with an changeable Spin , S , between , $-S$, to $+S$, resulting to a Stationary-State . i.e. it is an continuous , $-S + S = 0$, Torsional and **Point-equilibrium** , where Charge is equal to the Angular-Momentum

Vector per Unit-Plane or $\rightarrow S = AM / \pi = r m v = [a m c] / \pi \rightarrow$ Spin $S = [\frac{amc}{\pi}] = \vec{B} = \frac{2L}{w} = \frac{2L}{2\pi f} = \frac{\pi^2 r^4 \cdot f}{2} \equiv$

It is the $\rightarrow$ **Spin of Particle-cave** $\leftarrow$

Above **Double-Orbital-Periodic motion** $[\oplus \leftrightarrow \ominus]$ in a Material-Point is the eternal-Plane-Curve-motion of the $\oplus$ constituent to the $\ominus$ constituent in the two x, z , axis of motion . Considering the distance of motion be , the diameter of the cave , $l = 2r$, then velocities are as angular velocity , w , and the velocity , v , under the condition , $y(2r,0) = 0$, then leads to Energy-equation $\sin \frac{2rw}{v} = 0$, or $w_n \frac{2r}{v} = n \frac{4\pi r}{\lambda} = \frac{4\pi r f}{v}$, where $n = 1, 0$, $\lambda = \frac{c}{f}$ which is the wavelength and , f , is the frequency of oscillation , i.e.

The , $n = 1$, defines a **Normal mode vibration** with **natural frequency** $\rightarrow f_n = \frac{v}{2\pi r} = \frac{\sigma}{4\pi r} [1 + \sqrt{5}] \dots (n)$

Above **Double-Orbital-motion** is in a Uniform-Energy-Point-Space as this is for Spin $S = \bar{B}$ and then Issues

$\bar{B} = \bar{r} m \bar{v} = \sqrt{\bar{r}^2 + m^2 \bar{v}^2}$, because the Vector $\bar{r} \equiv \text{Space}$, is Perpendicular to Vector $m\bar{v} \equiv \text{The Energy}$, which shows the Eternal and **continual-Perpendicularity of Space and the Anti-Space** in all Sub-Spaces.

Laplace Energy-equation for **Incompressible Space** $\bar{r}$, is $\nabla^2 E = -\nabla E = -\nabla \bar{B} = -\nabla \sqrt{\bar{r}^2 + m^2 \bar{v}^2}$, and by squaring then, $-\nabla \bar{r}^2 + [2\pi m f \bar{a}]^2 = 0$, where issues $\bar{r} = -2\pi m f \cdot \bar{a} \dots\dots(1)$

The condition for **Irrotational Energy** is $\rightarrow \nabla \times \bar{B} = \nabla \times \bar{S} = 0$, or $\nabla \times \bar{B} = \nabla \bar{r} + 2\pi m f \cdot \bar{a} = 0$, and vector $\bar{r} = 2\pi m f \cdot \bar{a} \dots\dots(2)$. Relations, (1), (2), $+\bar{a}$ and $-\bar{a}$ vectors, denote the **Alternative-Positions of Magnetic Field** in the **Two-transverse-Positions** as in Fig 35- (2).

For Photons which force is $F_{\text{photon}} = \frac{[\oplus \leftrightarrow \ominus]}{r^2} = \frac{[\sigma \cdot \sigma]}{r^2} = \left| \frac{\sigma}{r} \right|^2 = \left| \frac{2\pi f}{\Phi} \right|^2 = \left| \frac{2\bar{B}}{\pi \Phi r^4} \right|^2$, issue above.

Since for Electron equation, $4\pi^2 f^2 \cdot m_e = \mathbf{k} = \pi \mathbf{g}$, then for Gravity issues, $-\nabla E = -\nabla g \equiv 4\pi \cdot m_e f^2$, and

$$\bar{q}_{\text{Photon}} = \frac{G}{\sqrt{2} \cdot f} = \frac{G \cdot h}{\sqrt{2} \cdot E} = \frac{[6,680561 \cdot 10^{-11}] \cdot [6,62606957 \cdot 10^{-34}]}{\sqrt{2} \cdot E=1} = 3,13 \cdot 10^{-44} \text{ C}.$$

All above Physical Structures Vibrate, In-Sectors with minimum Energy, and form the $\rightarrow$ Electron-charge $\leftarrow$ In Surfaces with minimum Energy, and thus forming the Orbits.

The Orbit relation $\mathbf{r}^3 \mathbf{f}_p^2 = \text{Constant}$, as multiplication of Space-cave, $\mathbf{r}$, and frequency, $\mathbf{f}$, as Energy,

The Unit-Work done $\equiv$ motion, and conserved in orbit $\mathbf{r}$ as the $\mathbf{n}$ frequencies $f_n = \frac{v}{2\pi r} = \frac{\sigma}{4\pi r} [1 + \sqrt{5}] = \frac{\sigma \cdot \Phi}{2\pi r}$

and after filling the **minimum cave**, Burst Into another cave **connected to G** $= \Phi^2 [2\pi r \cdot f_p \equiv \frac{2B}{\pi r^3}]$

4-i... Remarks on EPR Argument :

The Point like Particles, of Quantum Mechanics in Vacuum, are the only three Elements in, [66-68], as $[s^2 = v^2 \equiv \oplus, 2s^2 = 2v^2 \equiv \emptyset, -s^2 = -v^2 \equiv \ominus]$, which are the content, *Primary material*, of Cosmic Particles [91]. The extension for a Deeper existence of the Particles is defined in Coulomb-Energy equation where Force

$F_C = \frac{C \cdot Q}{r^2}$ and Voltage $V_C = \frac{C \cdot Q}{r}$, and so $V_C = r \cdot F_C$, or $\rightarrow$ **Force** $[F_C] \times$ **Cave** $[r] =$ **Voltage** $[V_C] \leftarrow$ i.e.

Voltage of caves defines Forces in caves and Presented in NEW Interaction Method, [4.h], Based on the **Particle-Wave-Knowledge**, of the **Constructive and Destructive Interference of Waves**. For light-Rays

Euclidean - Geometry $\rightarrow EG \equiv$ Light ray is $\rightarrow \bar{v} \cdot [\bar{f}_n + f_n] \equiv$ Straight line $\equiv \bar{v} \cdot [f_n] \equiv$ **The E- Geometry**

Hyperbolic - Geometry $\rightarrow HG \equiv$ Light ray $\rightarrow \bar{v} \cdot [\bar{f}_n + f_n] \equiv$ A Great Circle $\equiv \bar{f}_n \equiv$ **The H- Geometry**

Riemannian-Geometry $\rightarrow RG \equiv$ Light ray $\rightarrow \bar{v} \cdot [\bar{f}_n + f_n] \equiv$ A Line-Sector $\equiv \bar{v} \cdot \bar{f}_n \equiv$ **The R- Geometry**

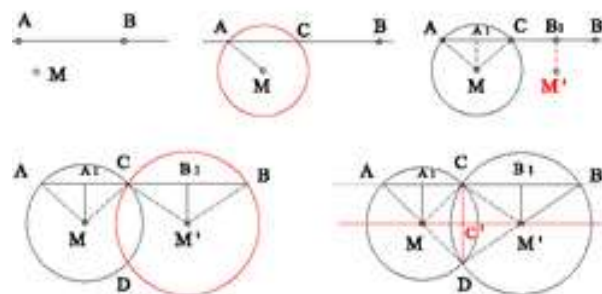
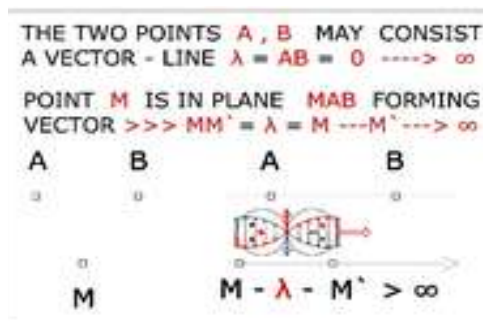
Material -Geometry $\rightarrow MG \equiv$ Light ray $\rightarrow \bar{v} = \bar{c} \cdot [\bar{f}_n + f_n] \equiv \bar{c} \cdot \{[\oplus \leftarrow \lambda \rightarrow \ominus] \rightarrow \lambda \leftarrow [\oplus \leftarrow \lambda \rightarrow \ominus]\} \equiv$
 $[MG] [MG] [MG] \text{ i.e.}$

The Straight line-Vector, From **An-monad** To $\leftarrow -\infty$, From **monad** to **Second-monad**, and **Between** $\pm\infty$, **Or**, **A Line-Sector in Caves** and **{ A Whole Line-Sector as Straight line to Infinite }**, As $\bar{v} \cdot [\bar{f}_n + f_n]$ with

wavelength $\{\bar{v} \cdot \bar{f}_n\} \rightarrow [\bar{v} = \bar{c} = \lambda \cdot \frac{f}{\Phi}]$ to be, The-Dual-Nature of Light-Photon of **Material - Geometry** [9].

The answer is left to the Reader $\rightarrow$ Markos Georgallides 25 / 9 / 2020 $\leftarrow$

The Method in $\rightarrow$ (F-1) $\downarrow$ (F-2)



B... A short Presentation of Proving above from Articles [38, 47-48].

In (F-1), Any Two-Points A, B consist a straight line through Points A, B, and let M, be any other Point. When $MA + MB > AB$ then Point M is not on AB, (differently if $MA + MB = AB$ then this answers the question of

why any line contains at least two Points , *the two End-Points* , A , B , i.e. for any Point M on line AB where is holding , $MA+MB = AB$, means that lines MA , MB coincide on AB , and thus is proved from the other axioms and so D2 is not an axiom.

To Prove that , One and only One line MM' can be drawn Parallel to AB .

To Prove the above Axiom is necessary to show :

- a... The Parallel to AB is the locus of all Points at a Constant-Distance ,h, from line AB ,and for Point M is MA_1
b... The locus of all these Points is a Straight line.

Step 1

Draw the circle (M ,MA) be joined meeting line AB in C . Since $MA = MC$, point M is on mid-perpendicular of AC . Let A_1 be the midpoint of AC, (it is $A_1A+A_1C = AC$ because A_1 is on the straight line AC. Triangles MAA_1 , MCA_1 are equal because the three sides are equal, therefore angle $\angle MA_1A = \angle MA_1C$ (CN₁) and since the sum of the two angles $\angle MA_1A + \angle MA_1C = 180^\circ$ (CN₂, 6D) then angle $\angle MA_1A = \angle MA_1C = 90^\circ$ (P4) so, MA_1 is the minimum fixed distance h of point M to AC.

Step 2

Let B_1 be the midpoint of CB, (it is $B_1C+B_1B = CB$ because B_1 is on the straight line CB) and draw $B_1M' = h$ equal to A_1M on the mid-perpendicular from point B_1 to CB . Draw the circle (M' , $M'B = M'C$) intersecting the circle (M , $MA = MC$) at point D .(P3) Since $M'C = M'B$, Point M' lies on mid-perpendicular of CB .(CN₁) . Since $M'C = M'D$, Point M' lies on mid-perpendicular of CD . (CN₁) . Since $MC = MD$, Point M lies on mid-perpendicular of CD . (CN₁) Because Points M and M' lie on the same mid-perpendicular (This mid perpendicular is drawn from Point C' to CD and it is the midpoint of CD) and because only one line MM' passes through Points M , M' then line MM' coincides with this mid-perpendicular (CN₄) .

Step 3

Draw the perpendicular of CD at Point C' . (P3, P1)

- a.. Because $MA_1 \perp AC$ and also $MC' \perp CD$ then angle $\angle A_1MC' = \angle A_1CC'$. (Cn 2,Cn3,E.I.15) Because $M'B_1 \perp CB$ and also $M'C' \perp CD$ then angle $\angle B_1M'C' = \angle B_1CC'$. (Cn2, Cn3, E.I.15)
b.. The sum of angles $\angle A_1CC' + \angle B_1CC' = 180^\circ = \angle A_1MC' + \angle B_1M'C'$. (6.D) , and since Point C' lies on straight line MM' , therefore the sum of angles in shape $A_1B_1M'M$ are $\angle MA_1B_1 + \angle A_1B_1M' + [\angle B_1M'M + \angle M'MA_1] = 90^\circ + 90^\circ + 180^\circ = 360^\circ$ (Cn2) , i.e.
The sum of angles in a Quadrilateral is 360° and in Rectangle all equal to 90° . (m)
c.. The right-angled triangles MA_1B_1 , $M'B_1A_1$ are equal because $A_1M = B_1M'$ and A_1B_1 common , therefore side $A_1M' = A_1M$ (Cn1). Triangles A_1MM' , $B_1M'M$ are equal because have the three sides equal each other , therefore angle $\angle A_1MM' = \angle B_1M'M$, and since their sum is 180° as before (6D) , so angle $\angle A_1MM' = \angle B_1M'M = 90^\circ$ (Cn2).
d.. Since angle $\angle A_1MM' = \angle A_1CC'$ and also angle $\angle B_1M'M = \angle B_1CC'$ (P4), therefore quadrilaterals $A_1CC'M$, $B_1CC'M$, $A_1B_1M'M$ are Rectangles (CN3) . From the above three rectangles and because all points (M , M' and C') equidistant from AB , this means that C'C is also the minimum equal distance of point C' to line AB or , $h = MA_1 = M'B_1 = CD / 2 = C'C$ (Cn1) Namely , line MM' is perpendicular to segment CD at point C' and this line coincides with the mid-perpendicular of CD at this point C' and points M , M' , C' are on line MM' . Point C' equidistant ,h, from line AB , as it is for Points M , M' , so the locus of the three Points is the straight line MM' , and so the two demands are satisfied , $[h = C'C = MA_1 = M'B_1$ and also $C'C \perp AB$, $MA_1 \perp AB$, $M'B_1 \perp AB$) . (o.e.δ.)
e.. The right-angle triangles A_1CM , MCC' are equal because side $MA_1 = C'C$ and MC common so angle $\angle A_1CM = \angle C'MC$, and the Sum of angles $\angle C'MC + \angle MCB_1 = \angle A_1CM + \angle MCB_1 = 180^\circ$

B.1 The Succession of Proofs

- 1.. Draw the circle (M,MA) be joined meeting line AB in C and let A_1, B_1 be the midpoint of CA , CB .
- 2.. On mid-perpendicular B_1M' find Point M' such that $M'B_1 = MA_1$ and draw the circle (M' , $M'B = M'C$) intersecting the circle (M , $MA = MC$) at Point D .
- 3.. Draw mid-perpendicular of CD at Point C' .
- 4.. To show that line MM' is a straight line passing through Point C' and it is such that $MA_1 = M'B_1 = C'C = h$, i.e. a constant distance h , from line AB or , and also The Sum of angles $\angle C'MC + \angle MCB_1 = \angle A_1CM + \angle MCB_1 = 180^\circ$

B.2 Proofed Succession

- 1.. The mid-perpendicular of CD Passes through Points M , M' .
- 2.. Angle $\angle A_1MC' = \angle A_1MM' = \angle A_1CC'$, Angle $\angle B_1M'C' = \angle B_1M'M = \angle B_1CC' < \angle A_1MC' = \angle A_1CC'$

because their sides are perpendicular among them i.e. $\rightarrow MA_1 \perp CA, MC' \perp CC'$.

a..In case $\angle A_1MM' + \angle A_1CC' = 180^\circ$ and $\angle B_1M'M + \angle B_1CC' = 180^\circ$ then $\angle A_1MM' = 180^\circ - \angle A_1CC'$, $\angle B_1M'M = 180^\circ - \angle B_1CC'$, and by summation $\angle A_1MM' + \angle B_1M'M = 360^\circ - \angle A_1CC' - \angle B_1CC'$ or the Sum of angles $\angle A_1MM' + \angle B_1M'M = 360 - (\angle A_1CC' + \angle B_1CC') = 360 - 180^\circ = 180^\circ$

- 1.. The sum of angles $\angle A_1MM' + \angle B_1M'M = 180^\circ$ because the equal sum of angles $\angle A_1CC' + \angle B_1CC' = 180^\circ$, so the sum of angles in quadrilateral MA_1B_1M' is equal to 360° .
- 2..The right-angled triangles $MA_1B_1, M'B_1A_1$ are equal, so diagonal $MB_1 = M'A_1$ and since triangles $A_1MM', B_1M'M$ are equal, then angle $\angle A_1MM' = \angle B_1M'M$ and since their sum is 180° , therefore angle $\angle A_1MM' = \angle MM'B_1 = \angle M'B_1A_1 = \angle B_1A_1M = 90^\circ$
- 3..Since angle $\angle A_1CC' = \angle B_1CC' = 90^\circ$, then quadrilaterals $A_1CC'M, B_1CC'M'$ are rectangles and for the three rectangles $MA_1CC', CB_1M'C', MA_1B_1M'$ exists $MA_1 = M'B_1 = C'C$
- 4.. The right-angled triangles MCA_1, MCC' are equal, so angle $\angle A_1CM = \angle C'MC$ and since the sum of angles $\angle A_1CM + \angle MCB_1 = 180^\circ$ then also $\angle C'MC + \angle MCB_1 = 180^\circ \rightarrow$ which is the second to show as this problem has been set at first by Euclid.

All above is a Proof of the Parallel Postulate due to the fact that the parallel Postulate is dependent of the other four Axioms (now is proved as a theorem from the other four). Since AB is common to ∞ Planes and only one Plane is passing through point M (Plane ABM from the three points A, B, M), then the Parallel Postulate is valid for all Spaces which have this common Plane, as Spherical, n-dimensional geometry Spaces. It was proved that it is a necessary logical consequence of the others axioms, agree also with the Properties of Physical objects, $d + 0 = d, d * 0 = 0$, now is possible to decide through mathematical reasoning, that the Geometry of the Physical universe is Euclidean. Since the essential difference between Euclidean geometry and the two non-Euclidean-Geometries, Spherical and Hyperbolic geometry, is the nature of Parallel line, i.e. the parallel Postulate so, < The consistent System of the -Non-Euclidean Geometry -have to decide the direction of the existing mathematical logic >.

The above consistency proof is applicable to any line Segment AB on line AB, (segment AB is the first dimensional unit, as $AB = 0 \rightarrow \infty$), from any Point M not on line AB, $[MA + MB > AB]$ for three Points only which consist the Plane. For any Point M between Points A, B is holding $MA + MB = AB$ i.e. from two Points M, A or M, B passes the only one line AB. A line is also continuous (P1) with Points and discontinuous with segment AB [14], which is the metric defined by Non- Euclidean geometries, and it is the answer to the cry about the < crisis in the foundations of Euclid geometry > (F.2)

5.. A Line Contains at Least Two Points, is Not an Axiom Because is Proved as Theorem

Definition D2 states that for any Point M on line AB is holding $MA + MB = AB$ which is equal to < segment MA + segment MB is equal to segment AB > i.e. the two lines MA, MB coincide on line AB and thus this Postulate is proved also from the other axioms, thus D2 is not an axiom, which form a system self consistent with its intrinsic real-world meaning (F-1).

For Point, M, of distance **d** from AB line, AB Straight line becomes the only Parallel on M Point.

5-i.. The Criticism to Non-Euclid Geometries.

The Essential difference between Euclidean and non-Euclidean-Geometries is the Nature of Parallel lines taking into consideration that, **a Point** is nothing, **Two Points** define a **Straight line**, the **Three Points** define a **Plane**, **Four Points** define the **Space**, and the **N Points** define the **Nth-Space**. Euclid's fifth Postulate, the Parallel Postulate, states that, within a two-dimensional Plane ABM for a given line AB and a Point M, which is not on AB, then $MA + MB > AB$ and there is exactly one line through M that does not intersect AB because if $MA + MB = AB$ then Point M is on line AB and then lines MA, MB coincide each one passing from two Points only and thus is answered the why any line contains at least two Points. In Euclid geometry, in case of two straight lines that are both perpendicular to a third line, the lines remain at a constant distance from each other and are known as Parallels. Now is proved that, a Point M on the Nth Space, of any first dimensional Unit $AB = 0 \rightarrow \infty$, jointly exists, with all Sub-Spaces of higher than N Spaces, and with all Spaces of lower than N Subspaces [37-38]. This is the Structure of Euclidean Geometry.

As in fundamental theorem of Algebra Equations of Nth degree can be reduced to all N-a or N+a degree, by using the roots of the equations, in the same way Multi –Spaces are formed on AB. Nano-scale-Spaces, Inorganic and Organic, Cosmic-scale-Spaces are now unified in our world scale. Euclidean Empty-Space is Homogenously Continues, but all first dimensional Unit-Spaces Heterogeneous and this because all Spaces constitute another Unit (the Nth Space Tensor is the boundaries of N Points). All above referred and many others are springing from the first acceptance for Point, and the approaching of Points. By multiplication is

created another one very important logical notion for the laws concerning Continues or Not Continues Transformations in Space and in Time for Mechanics , Physics Chemistry and motions generally. From this logic yields that a limited and not an unlimited Universe can Spring anywhere .

Since Non-existence is found everywhere then Existence is found and is Done everywhere .

If Universe follows Euclidean Geometry, then this is not expanded indefinitely at escape velocity , but is moving in Changeable Spaces with all types of motions as , < an Twin Symmetrically Axial –Centrifugal Rotation >>> into a Steady Space (This is System $AB \perp AB = 0 \rightarrow AB \rightarrow \infty$), with all types of curvatures . (It is a Moving and Changeable Universe into a Steady Formation) [7] . It was proved that on every Point in Euclid Spaces exist infinite Impulse $P = 0 \rightarrow P \rightarrow \infty$, and so is growing the idea that Matter was never concentrated at a Point and also Energy was never high < very high energy > [17] , i.e. Bing Bang has never been existed , but it is a Space conservation Energy State $\rightarrow W = \int A-B [P.ds] = \sum P.\delta = 0$. [21] , which results to **Stresses and Strains** $\sigma_1 . [1 \pm (\sqrt{5})] / 2 = \sigma . \Phi$. Hyperbolic Geometry, by contrast, states that there are infinitely many lines through M , not intersecting AB . In Hyperbolic Geometry, the two lines “ curve away ” from each other, increasing in distance as one moves further from the Points of intersection with the Common perpendicular, which have been called ultra-parallel . The simplest model for Hyperbolic Geometry is the pseudo-sphere of Beltrami-Klein, which is a portion of the appropriate curvature of Hyperbolic Space, and the Klein model, by contrast, **calls a Segment as Line and the disk as Plane.???** In Hyperbolic Geometry the three angles of a triangle add less than 180° , without referring that triangle is

Not in Plane but on Sphere <**Spherical Triangle F2(1)**>This omission created the wrong Hyperbolic Geometry. Mobius strip and Klein bottle (complete one-sided objects of three and four dimensions) transfers the Parallel Postulate to a **Problem of one Point M and a Plane** , because all curves and other curve lines are not lines (For any Point on a straight line exists < **The Whole is equal to the Parts which is an Equality** > and **Not the Inequality of The Three Points**) because contradict to the three Points only and anywhere.

Einstein's theory of General Relativity is Bounded in deviation Plank's length level , where exists Space-time. Euclid Geometry is extended to zero length level where Gravity exists as Pointy-Energy with wavelength near zero and infinite Energy , a different phenomenon than Space-time . In this way is proved that Propositions are true only then , IF they follow Objective Logic of Nature which is the meter of all logics . Answers also to those who compromise incompatibility by addition or mixture.

If our Universe follows Hyperbolic Geometry then this is expanded indefinitely , which contradicts to the Homogenous and Isotropic Empty Spaces . [37] .

This guides to a concentrated at a Point matter and Energy < very High Energy > , Bing Bang event . Elliptic Geometry , by contrast, states that , all lines through Point M , intersect AB . In Elliptic Geometry the two lines “curve toward” each other and eventually intersect. The simplest model for Elliptic Geometry is a Sphere , where lines are “**Great Circles**”???. For any **Great Circle** (which is **Not a Straight Line** ???) and a Point M which is not on the circle all circles (**Not lines** ???) through Point M will intersect the circle . In Elliptic Geometry the three angles of a triangle add greater than 180° , without referring that triangle is Not in Plane , But in the Sphere, < in Spherical triangle F2(3) > .This omission created the **wrong Elliptic-Geometry** . If Universe follows Elliptic Geometry then this is expanded to a halt and then this will stark to shrink possibly not to explode as is said , but to change the axial-centrifugal motion to the initial Rectilinear . GR of Einstein assimilates gravity as the **Curvature in Space-Time** and **Not as Force** and this based on Elliptic Geometry , by contrast , stating that , all lines through a Point M and Parallel to a line AB intersect line . In Elliptic Geometry the two lines “curve toward” each other and eventually intersect .

The simplest model for Elliptic Geometry is a Sphere , where **lines are “Great Circles”**. ??? . For any great circle (**which is not a Straight line**) and a Point M which is not on the circle all circles through Point M will intersect the circle . In Elliptic Geometry the three angles of a triangle add greater than 180° , without referring that **triangle is Not in Plane** , but in the Sphere (**Spherical Triangle**) . *This omission created the wrong Elliptic Geometry and all others* . Assuming the Postulate of Relativity , $c = \text{constant}$ was valid without restrictions , this would imply that all forces of nature must be invariant under Lorentz transformations in order that principle be rigorously and universally true . Also say that an Object flying pass a massive object , the Space-Time is curved by the massive object .

It is Proved in [32] that from any Point , M , not on line AB can be drawn one and only one Parallel to AB ,[33] which Parallel doesn't intersect line , so the Elliptic Geometry must be revised also . In [36-37] [89-92] , Gravity is force $[V_i = 2(wr)^2]$ in the Medium-Field-Material-Fragment $|\pm s^2| = (wr)^2 = [MFMF]$ which is the base for all motions . Appealing Space-Time a Priori accepts the two elements , **Space and Time** , as the

fundamental elements of universe without any Proof for it , so anybody can say that **this Stay on Air** . 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 $\overrightarrow{PA} = - \overrightarrow{PB}$ following *Principle of Virtual Displacement* .Time is the conversion factor between the conventional units (*second*) and length units (*meter*) .By considering the moving monads (*Particles etc. in Space*) at the speed of light , pass also through Time , **which time** ??? , maybe that one measuring motion . If so this is an widely agreeable illusion . Markos 12 /12/ 1999

8. Conclusions :

1... A line of Light ray , Two Points only , is not a great circle , as Hyperbolic-Geometry accepts , so anything which is built on this logic is a mislead false . The fact that the Sum of angles on any triangle is 180° is springing for the first time, in this article Rational Figured numbers or Figures [17].

This admission of two or more than two Parallel lines , instead of one of Euclid's , does not Proof the truth of the admission . The same to Euclid's also , until the **Present Proved method of the Parallel Postulate** , $[\oplus \leftarrow \lambda \rightarrow \ominus] \rightarrow \lambda \leftarrow [\oplus \leftarrow \lambda \rightarrow \ominus]$, where from $\oplus$ Point is drawn Straight line $[\oplus \rightarrow \lambda \rightarrow \ominus]$ with the λ , vector which is a **Straight-line**. Euclidean Geometry does not distinguish , Space from time because time exists only in its deviation-Plank's length level , neither Space from Energy because Energy exists as quanta on any first dimensional Unit AB - which connects the only Two fundamental Elements of Universe , that of **Space $\equiv$ Two-Points** and that of **Energy $\equiv$ motion between the Two Points** . [21] .

The **Material-Geometry** is the answer , where Photon-Particle is The moving-storage $[\bar{\mathbf{v}} \cdot \boxed{\bar{\mathbf{f}}_n}] \rightarrow$ with inner velocity and wavelength $[\bar{\mathbf{v}} = \bar{\mathbf{c}} = \lambda \frac{f}{\phi}]$ of **Stationary-Store** $\equiv [S \equiv EM-R \equiv f_{1=N}, f_2, f_3, f_D, f_n = w^2]$, as an Wave of **F-frequency** $\rightarrow [f_1 = (E^2+H^2) = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\bar{B}}{\pi^2 r^4}]$ and as an **Electromagnetic-Wave moving-Store** $\{W \equiv EM-R \equiv [\epsilon E^2 + \mu B^2] = 2.\lambda c.\sin.2\phi\}$ from stresses $\bar{\mathbf{v}} [\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}] \equiv \bar{\mathbf{v}} \cdot [\boxed{\bar{\mathbf{f}}_n} + \mathbf{f}_n]$, becoming frequencies

2...A Plane of Infinite Light rays ,Three Points only ,is not a Line-Sector as the Riemann-Geometry accepts .

The Infinite Light-rays in Plane follow the Proved , **The line of Light ray of Two Points only** the Line-Sector $[\oplus \leftarrow \lambda \rightarrow \ominus]$, of the Parallel Postulate and not the Plane . In Plane exist Infinite-lines which follow the Prior as a moving-storage the Wavelength $\rightarrow [\bar{\mathbf{v}} = \bar{\mathbf{c}} = \lambda \frac{f}{\phi}]$ and as Wave $[\bar{\mathbf{v}} \cdot \mathbf{f}_n] \rightarrow$ with Fundamental frequency $[f_1 = (E^2+H^2) = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\bar{B}}{\pi^2 r^4}] \rightarrow \{W \equiv EM-R \equiv [\epsilon E^2 + \mu B^2] = 2.\lambda c.\sin.2\phi\}$.

3... A Space of Four-Planes , Four Points only , and of Infinite Light rays is not a Line-Sector as the Riemann Geometry accepts . The Infinite Light-rays in Plane follow the Proved , **The line of Light ray of Two Points only** , as the $\rightarrow$ Line-Sector $[\oplus \leftarrow \lambda \rightarrow \ominus]$, which is a Straight line even the Two-Points , $\oplus$, $\ominus$, are at a distance $d=0$ or $d=\infty \leftarrow$, Continuously Parallel Postulate and Not of the Infinite Planes and Volumes .

The Four Planes denote the minimum Volume-Structures of nature as , Regular Tetrahedron , Carbon ,

4... A Line-Sector in Nth-Space of N-Planes is a , **Line-Sector in Caves** , and **Line-Sector on Straight-line to Infinite** , as The proposed Method in this article , and which is based on the Prior four axioms only , **Proofs** , (not using any admission but a pure geometric logic under the restrictions imposed to seek the solution to the Problem) that , through Point M on any Plane ABM (**three Points only which consist the Plane**) , Passes only one line of which all Points equidistant from AB as Point , M , i.e. the right is to Euclid Geometry and to the Branch of Material-Geometry which unifies the **Space** , and which are the **Two Points only** , $[\oplus \leftarrow \lambda \rightarrow \ominus]$ and **Energy** which is the motion $[\leftarrow \leftrightarrow \rightarrow]$ **between them** .

Any two Points **A , B on Primary-Space or Anti-Space** , consist the first Dimensional Unit , **AB** , so itself using the same Principles of Equality ($AB = BA$) , **Inequality** ($AB \neq BA$) and **Stability** , ($AB \perp BA$) , creates **all Spaces , Anti-Spaces and Sub-Spaces of Unit AB** and Since are Property of this Unit only , therefore each of these **Bounded Spaces is a Restrained - System of this Unit AB** . [10] . Quantization of Points becomes through this Vector Unit $\overrightarrow{ds} \equiv \overrightarrow{AB}$, which is the first dimensional Unit the [Zenon Paradox – [13] , and this is so , because Vector **AB** has Position [AB] and Direction $\overrightarrow{AB}$. i.e.

$\overrightarrow{AB}$ Line-Vector of Two Points Only , is the **Light - Ray** such for Stationary Caves $\bar{\mathbf{v}} \cdot \boxed{\bar{\mathbf{f}}_n}$,

as for Electromagnetic-Wave Caves [$\bar{\mathbf{v}} \cdot \mathbf{f}_n$] on Vectors-Straight-lines from Zero to infinity .

6-i... A CRITIC ON THE - FUNDAMENTAL - FORCES

1.. Gravitational-Force :

It was shown[81] that **The Primary-Material-Point** is composed of Infinite-Material-Points in the Two Aperon , $+\infty$, $-\infty$,which consist a Huge Magnet with Infinite Parallel-lineswhere the $\oplus$ constituent Attacks , $\Rightarrow$ **moving to** the case is *Newton-Gravitational-constant G-force* $\rightarrow$ **Periodically** to the $\ominus$ constituent [82-86] . The Newtonian Constant of Gravitation G is related

to Gravity $\mathbf{g}$, as $G = E = h \cdot f_n = [\frac{c \cdot r^3}{a^3}] \cdot [g_L k_L] = g \cdot k_E = g \cdot [g_L k_L]$,and is transformed into all types of motion i.e. Total Energy , velocity , mass , light velocity , Weight and generally as ,
Force $G \equiv \sigma \cdot \Phi^3 \equiv \Phi^2 \cdot [\{\sigma \cdot \Phi\} \equiv [\frac{2B}{\pi r^3}]] \equiv 2\pi f_p r \equiv w r \equiv \bar{v} \equiv m a = m g = \bar{c}] \equiv 6,674 \cdot 10^{-11} \text{ (Nm}^2\text{Kg}^{-2}\text{)}$
Stress $\{\sigma \cdot \Phi\} \equiv [\frac{2B}{\pi r^3}] \equiv 2\pi \cdot f_p r \equiv w r \equiv \bar{v} \equiv m a = m g = \bar{c}]$, is dependent on Total-Prior.

From above is seen that , **There is Not any Vacuum** , instead exist **Infinite-Material-Points** which are created from the Periodic excitation and which **are Spinning** in Opposite-Pairs for **System's Stability**.

The **Un-bonded-Force** , $\mathbf{G}$, or the **Gravitational-constant** , $\mathbf{G}$, was shown to be ,

The **Electric-Field-lines of a Dipole-Magnet** , [81B] i.e.

That we call, **SPACE** , is a **Huge-Electrostatic-Magnet** which is created from the **Infinite-Dipole-Primary Opposite -Charges which is** , The-**ENERGY**- Part of the Two-**Primary-Points** $\oplus$ to $\ominus$ only . [82 - 86] .

The extension for a Deeper existence of the Particles is defined in Coulomb-Energy equation , where Force $F_C = \frac{C \cdot Q}{r^2}$, and Voltage $V_C = \frac{C \cdot Q}{r}$ coexist , and so $V_C = r \cdot F_C$, or

Force $[F_C] \times \text{Cave } [r] = \text{Voltage } [V_C]$, i.e. **Voltage of Caves defines Forces in Caves** .

The Stress σ , occupies Minimum and Maximum because is related to frequency and velocity as ,

$$\rightarrow f_{ph} = [\frac{\sigma}{2\pi r} + \frac{\sigma \Phi}{2\pi r}] \equiv \frac{\sigma + \sigma \Phi}{2\pi r} = \frac{\sigma[1+\Phi]}{2\pi r} = \frac{\sigma[\Phi]^2}{2\pi r} , \text{ or } \sigma \equiv \frac{f_{ph} \cdot 2\pi r}{\Phi^2} \equiv \frac{w \cdot r}{\Phi^2} \equiv \frac{v}{\Phi^2} \equiv \bar{c} \frac{1}{\Phi^2} \leftarrow$$

and it is **The-Stress-Way** of Photon-Storages $\boxed{\bar{f}_n} \equiv \frac{\sigma}{2\pi r}$, and Photon-Information $\mathbf{f}_n \equiv \frac{\sigma \Phi}{2\pi r}$, so

Photon is directly related from $\mathbf{G}$ as $\rightarrow G = F = \sigma A = (2\pi f r) \frac{A}{\Phi} = w r \frac{A}{\Phi} = \bar{v} \frac{A}{\Phi} = \sigma \Phi^3 = \bar{c} \frac{A}{\Phi}$

This **Stationary-Energy-Storage** follows the , **Coulomb Electrical-Force** , where the Electrical Force is added , while for Photon , which is a **Moving-Energy-Storage** , exist the **Gravitational-Forces** as ,

$$\mathbf{F}_{\text{electron}} = k_c \frac{Q_1 Q_2}{d^2} = \frac{[\oplus \leftarrow \ominus]}{d^2} = k_c \frac{2\sigma}{|e|^2} = k_c \left[\frac{4\pi f_1}{r \Phi} \right] = k_c \frac{\sigma}{r^2 \Phi^2} = k_c \frac{2\bar{c}}{r^2 \Phi^2} \text{ in Box } B_e , \text{ and for Motion}$$

$$\mathbf{F}_{\text{photon}} = \frac{[\oplus \leftarrow \ominus]}{r^2} = \frac{[\sigma \cdot \sigma]}{r^2} = \left| \frac{\sigma}{r} \right|^2 = \left| \frac{2\pi f}{\Phi} \right|^2 = \left| \frac{w}{\Phi} \right|^2 = \left| \frac{2L}{\Phi B} \right|^2 = \left| \frac{\bar{c}}{r \cdot \Phi} \right|^2 , \text{ in the same Box } B_e , \text{ since}$$

$$\text{Angular-momentum} \equiv \mathbf{Spin} \equiv \bar{B} = \frac{\pi r^3 \sigma}{4} [1 + \sqrt{5}] = \left| \frac{\pi r^3 \Phi \sigma}{2} \right| = \left[\frac{\pi r^3 \cdot \bar{c}}{2} \right] = \pi^2 \cdot r^4 \cdot f , \text{ as the Orbit-Forces .}$$

It is shown that Force , $\mathbf{G}$, occupies Mass , $\mathbf{m}$, from velocity , and Charge , $\mathbf{q}$, from Stress , therefore $\mathbf{G}$ is an Gravitational-Force as $\mathbf{F}_{\text{elec}}$, and an Electromagnetic-Force as $\mathbf{F}_{\text{photon}}$,

$$G = E = h \cdot f_n = [\frac{c \cdot r^3}{a^3}] \cdot [g_L k_L] = g \cdot k_E = g \cdot [g_L k_L] \equiv \sigma \times \Phi^3 = (2\pi f r) \frac{A}{\Phi} = \bar{v} \frac{A}{\Phi} = \bar{c} \frac{A}{\Phi}$$

Since for the **First Chemical-Neutral-material-cave** , $\mathbf{r}$, constants , g_L, k_L are equal to unity , i.e. $g_L = k_L = 1$, therefore above Energy of $E = 13,6 \text{ eV}$ in Hydrogen-Plane-orbit corresponds to the **minimum-energy-cave** , **The Phys-Quantized-Energy-Structure** . Since $\mathbf{G}$ Pushes $\rightarrow \mathbf{g}$ on the Earth-Unit-coefficient , k_E , and because is the **Starting , for first time begins** , of this **Mechanism** then from $G = g \cdot [g_L k_L] \equiv g \cdot [1 \cdot 1] \equiv \rightarrow g$, or $\mathbf{G} = \mathbf{g}$, meaning that in Earth System of gravity , the Newton's Gravitational constant , $\mathbf{G}$, and Gravity $\mathbf{g}$ are equal , while in all other Relative Systems are equal to the Proportionality of their Local-constant $\mathbf{k}_L$.

Now is Proved that , **Constant , $\mathbf{G}$, is the mechanism , the mould** for the **First-kick-Start** , upon this Unit-Granular-Energy-Stress-Layer , $\mathbf{g}$, to formulate in that orbit , $\mathbf{a}$, into Planck's Cave the lightest and the less-Energy mass Particle of this Universe , which is the Hydrogen with the minimum **Quantized Energy** of **13,6 eV** , following the **Material -Geometry Light-Ray** , $[\oplus \leftarrow \lambda \rightarrow \ominus] \rightarrow \lambda \leftarrow [\oplus \leftarrow \lambda \rightarrow \ominus]$

2.. Gravity-Force :

The Gravity-System , is an Infinite of $\pm$ Equilibrium-Rotating vectors $\bar{\mathbf{r}}$, where for the Stability $\uparrow \bar{\mathbf{r}} \downarrow \bar{\mathbf{r}} = \mathbf{0}$, and which **Gravity-System** interacts with **Hydrogen -Cave- Systems** .

The condition for **Irrotational Energy** is $\rightarrow \nabla \times \bar{\mathbf{B}} = \nabla \times \bar{\mathbf{S}} = \mathbf{0}$, or $\nabla \times \bar{\mathbf{B}} = \nabla \bar{\mathbf{r}} + 2\pi m f \cdot \bar{\mathbf{a}} = \mathbf{0}$, and $\bar{\mathbf{r}} = \pm 2\pi m f \cdot \bar{\mathbf{a}}$. Vector $\bar{\mathbf{r}}$, occupies Both directions for Rotational-equilibrium , i.e.

The vector $\bar{r} = \pm \bar{B} \equiv \bar{S}_n = 2\pi m f_n$, and $f_n = \frac{B}{2\pi m_e} = \frac{E}{h}$, is the **Stationary-Filling-Ocean of the always Spinning-Gravity-Material Points**, in the called **Empty-Space**, with frequency that of Material-Point as, $f_n = n.f_1 = \frac{E}{h} = \frac{n.v}{2\pi r} = \frac{n\sigma}{4\pi r} [1+\sqrt{5}] = \left| \frac{\sigma \cdot \Phi}{2\pi r_n} \right|$, and from $v = w r = 2\pi f r$ then,

$$f_n = v/2\pi r = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\sigma \cdot \Phi}{2\pi r_n}, \text{ and } \bar{v} = \sigma \cdot \Phi \dots(a), \text{ and } \pm \text{Spin } S_G = \bar{B} = J w = \pi^2 \cdot r^4 \cdot f_n = g \quad \text{i.e.}$$

Gravitational-Constant Force $\equiv G$, is Spread-over **a minimum - Surface, the Layer or Conductor or, a-Surface, or The-Permissible-Path**, in-where exists Reaction as **mass**

From the Energy-force F_g in any cave, $r = L_P$ of Planck's scale of any reaction to any change of velocity motion and **which is mass**, the $m_g = J.w^2$, and in Electricity is Impedance, where angular-velocity $w = \frac{c}{r}$ and, in the 3-Dimensional Space of the Two Elements is $[2^3 = (\oplus \leftrightarrow \ominus)^3]$, The Impedance, g_z , of the 3D Space is $\rightarrow \ln(3) \leftarrow$ and of Anti - Space is $\rightarrow \pi\sqrt{3}$, and this because consist the moulds of Growth [45]. or

$\rightarrow$ **The Light velocity vector** $\bar{v} = \bar{c}$ is **Acting on cave**, $r = L_P$, and finding **Impedance** m_g , becomes the **Centrifugal-Force** F_g of **Cave** and becomes the **Gravity** $g \leftarrow$ as,
 $F_g = m_g \left[\frac{c^2}{r} \right] = J w^2 \cdot \frac{c^2}{r} \cdot g_z = \left[\frac{\pi r^4}{2} \right] \cdot \left[\frac{c^2}{r} \right] \cdot \{ 2^3 \cdot \ln(3) \cdot \pi\sqrt{3} \} = 4\sqrt{3} \ln(3) \cdot \pi^2 r c^4$, or
Gravity $\rightarrow \bar{g} = 4\sqrt{3} \cdot \ln(3) \cdot \pi^2 L_P c^4 \leftarrow$ i.e. $\rightarrow$ For the **In-Planck's-length**, It is
The Centripetal-Force, $F_g = \bar{g}$, of **The Pointy- Spinning Material-Points**, $\bar{S}_{pg} \equiv \bar{B} \equiv$
 $= 4 \cdot \sqrt{3} \cdot 1,0986122886681 \cdot \pi^2 \cdot 1,616199 \cdot 10^{-35} \cdot [2.99819938]^4 = 9, 8076754$.

Moreover from relation $(4\pi a^3/3)^3 = 1,616229 \cdot 10^{-35}$, $a = 5,447 \cdot 10^{-11}$, or semi-major axis of Hydrogen cave is $a = 10^{-11}$ m, and $a = 2x = 2, 1145016 \cdot 10^{-11}$ m. Placing in Hydrogen-Rim. Period **T**, and Prior Semi-major axis **a**, then Unit-Energy $\rightarrow k = \frac{T^2}{a^3} = \frac{[3,04513 \cdot 10^{-16}]^2}{[2,1145016 \cdot 10^{-11}]^3} = \frac{9,2728109 \cdot 10^{-32}}{9,4541768 \cdot 10^{-33}} = 9, 808238 \frac{s^2}{m^3} = \frac{N}{Kg}$, a Constant-Action.

agreeing with that of Gravity constant, g, measured.

For the **Out-Planck's-length** Photon-velocity equation $\bar{v}_m = n \cdot \bar{c} \cdot \{ \left[\bar{f}_n \right] + f_n \}$ and from $\bar{v}_m = w r = n \cdot \pi \cdot c$, $f = \left[\frac{n \cdot c}{2r} \right]$, then $\rightarrow \bar{v}_m = n \cdot \bar{c} \cdot \{ \left[\bar{f}_n \right] + f_n \} \leftarrow$ **which is velocity-Out** L_P .

Photon was Proved to be a Material-Point in cave, **r**, where its **Inner Storage** is, **The Stationary Standing-wave** the Electromagnetic-Wave $[E^2+H^2] = 2(2r) \cdot c \cdot \sin 2\phi$ with, **n Lobes** representing the **Normal mode vibration** with frequencies $f_n = n \cdot f_1 = \frac{E}{h} = \frac{n.v}{4r} = \frac{n\sigma}{2\pi r} [1+\sqrt{5}]$, and on Two or more Possible nodes of the Standing-Wave $\rightarrow \oplus \lambda/2 \ominus \leftarrow$

The two Spaces $\oplus$ and Anti-Space $\ominus$ Exist on the Two opposite-nodes of the Standing-wave wavelength, λ , and for the **Outward Storage is the Propagating Electromagnetic- Wave** as,
 $\rightarrow \{ [eE^2+\mu B^2] = 2 \cdot \lambda \cdot c \cdot \sin 2\phi \} \leftarrow$ where, **Particle** $2r = n \lambda = n \cdot \bar{c} \cdot \{ \left[\bar{f}_n \right] \}$. The Cave **r**, is the **Electromagnetic-Energy-Storage**, and equal to $\rightarrow n \cdot \bar{c} \cdot \{ f_n = \frac{E}{h} \}$ which is Electromagnetic - Radiation **E**, **B**, which is the **Wave Conveyer of Cave**, **r**, with frequency **f** = Energy **E** / **h**.

From relation Stress $\sigma = \frac{c}{\Phi} = \frac{2\pi r f}{(n)\Phi} = \frac{2\pi r f}{1 \cdot \Phi} = \frac{2\pi \cdot 1,616199 \cdot 10^{-35} \cdot 2,939494 \cdot 10^{42}}{1,6180339} = 1,84456315 \cdot 10^8 \text{ t / m}^2$
 $= 1,84456315 \cdot 10^{11} \text{ Kg / m}^2$, and is the Information-way for the **In-Planck-length**.

Stress $\sigma_{PL} = n \cdot 1,84456315 \cdot 10^{11} \text{ Kg/m}^2$, and is for the **Outside-Planck's-Length-caves**.

Remarks :

a.. The Stresses become from a Force and a Surface as equation $\sigma = \frac{F}{A}$, and in the case of the „ $|v_x| \cdot |v_y|$ “,

Gravitational constant **G** and a cave **r**, then $\rightarrow \sigma = \frac{G}{4\pi r^2} = \frac{G}{\pi(2r)^2} = \left| \frac{G}{\pi s^2} \right|$, or an Square-vector $\bar{s}$.

Above relation means that Force **G**, needs a Vector-surface, $\pi \cdot s^2$, to be spread as Stress σ , and Unit Energy $v = G / \pi s^2 = G / [\pi |v_x| \cdot |v_y|]$, is Anti-Quadrature of Constant-light-velocity **c**, as the **first Surface**.
i.e. Light velocity-Vector $\bar{c}$, of wavelength λ , Propagates with Gravity **g**, as the minimum-Energy

by equating it with a Vector surface $\pi \cdot s^2 = \pi |v_x| \cdot |v_y| = \pi \cdot c_x \cdot c_y = \pi \cdot c^2$, since $c_x = c_y = c$

b.. The case of a vector, $\bar{s}$, is the **Linear-Stress** while of an Plane is the **Surface - Stress** and consequently for a Volume is a **Space - Stress**, as this was referred before for **G Force**, i.e.

$$G \equiv \sigma \cdot \Phi^3 \equiv \Phi^2 \cdot \{ \sigma \Phi \} \equiv \left[\frac{2B}{\pi r^3} \right] = 2\pi f_P r \equiv w r \equiv \bar{v} \equiv m a \equiv m g = \bar{c} = \frac{2 \cdot B}{\pi r^3} = g \cdot k_E$$

from where issues $\Phi^2 \cdot [m g] = g \cdot k_E$, or $m = \frac{k_E}{\Phi^2}$ an expression of mass **m** and **k_E**.

- c.. Since Stresses follow equation $\sigma = \frac{F}{A} = \frac{2\pi r f}{\Phi}$, conclusively **Forces and Areas** are everywhere and are related to any-cave **r**, through **f**, which is the mean of **every-Information**.
- d.. Since the Nutation-Frequency $f_N = \frac{r_e \cdot Q_e}{2\pi \cdot J_3 \cdot w} = 2,8398447 \cdot 10^{10} \text{ s}^{-1}$, then $f_N = \frac{r^2 \cdot e \cdot \Phi \cdot Q_e}{2\pi \cdot J_3 \cdot G}$
 i.e. the **effect of Gravity issues in caves** and is related to **G as Nutation - Force**.
 The Golden-Ratio-frequency $f_p = \frac{\sigma \cdot r}{\pi \cdot B} = \frac{n \cdot \sigma \cdot \Phi}{2\pi r}$, exists in nature from the micro to the macro Scale and is a **Pressure, σ , everywhere** in all the Energy Structures.
- e.. Light velocity vector $\bar{v} = \bar{c}$ Acting on **an-cave**, $r \neq L_p$, faces-to the Impedance **Z_c** , from Velocity **$\bar{c}$** , and becomes the minimum-Energy-cave in L_p , and Equal to **$E \equiv r Z_c \bar{c}$** , or cave $r_H = \frac{h}{c Z_c} = \frac{[6,62606957 \cdot 10^{-34}]}{2,99798 \cdot 10^8 \cdot 1,0460975 \cdot 10^{-31}} = 2,1127839 \cdot 10^{-11} \text{ m}$, which is the Hydrogen cave.
 Energy in this cave is $E = k \frac{T^2}{a^3} = \frac{[3,04513 \cdot 10^{-16}]^2}{[2,1145016 \cdot 10^{-11}]^3} = \frac{9,2728109 \cdot 10^{-32}}{9,4541768 \cdot 10^{-33}} = 9,808238 \frac{\text{J}}{\text{kg}}$
- f... Atoms Bonding happens on, **Slit-Vectors { Bracket-Orbit-Hook }** which occupy the **Unit Energy-Space frequency** in order that, the negative Electron-Hook $\ominus$, to Joint with the Bracket-Proton $\oplus$. In order this to happen is needed a common equation for the *different* **[Bracket-Orbit-Hook $\equiv 2r$] as $\rightarrow \ddot{r} + w^2 r = 0$ where $w = 2\pi f_1$ as above frequency,
 $2r = \Delta$, is the amplitude of an vibration, and then $T = 2\pi \sqrt{\frac{m}{k}}$, and is the **Natural-frequency**
 $f_1 = T^{-1} = \frac{1}{2\pi} \sqrt{\frac{k}{m}} = \frac{1}{2\pi} \sqrt{\frac{g}{\Delta}}$ of the cave $2r = \Delta = \frac{g}{k}$, i.e. **Hooks are the Energy Loops**.**
- g.. From Gravity-Force $DE \equiv [\bar{c} \cdot \nabla i] \equiv \bar{c} [\nabla i] \equiv$ The Travelling-Energy-cave, **$\bar{c}$** , with the velocity vector, **$\bar{c}$** , **Gravity g** , does dominate over the other forces and thus has a long range. The Strong and Weak Nuclear forces are very short ranged in the Nuclei of atoms. Electron- Nutation occurs because Gravity acts on the Electron mass and thus **Energy is created and overflows** as Photons. For Planets issues the Volume-Spherical effect, $3/4\pi r^3$, because of the mass dominating, while the Atom – Range - action follows that of Electric-Dipole.
- h.. For a circular motion in **Neutrino - Caves, dominates velocity**, which is Proportional to the inverse square of radius, **r**, and **Newton-Force acceleration** is the fifth power, where the constant energy $C = \frac{\pi a b}{T} = \frac{\pi a}{T} \left[\frac{1}{r^2} \right] = \frac{\pi a}{T r^2}$. From relation $r = 2a \cdot \cos \varphi$ is, $\cos \varphi = \frac{r}{2a}$, $\frac{1}{r} = \frac{1}{2a \cos \varphi}$ and $\frac{d(1/r)}{d\varphi} = \frac{1}{r} \tan \varphi$, and from Central-motion-Energy velocity $\rightarrow v^2 = 4C^2 \cdot \left[\frac{e^2 \sin^2 \varphi}{p} + \frac{1}{r^2} \right] = v^2 = 4C^2 \cdot [\tan^2 \varphi + 1] = \frac{4C^2}{r^2} \cdot \frac{1}{\cos^2 \varphi} = \frac{16C^2 a^2}{r^4}$ and **the velocity** $\rightarrow v = \frac{4Ca}{r^2} = \frac{2\pi f}{r} = \frac{w}{r}$, or Newton's-Force is inverse squared the distance **r**.
 The Centripetal -acceleration $a_p = \frac{v^2}{r} = - \left[\frac{16C^2 a^2}{r^4} \right] \cdot \frac{1}{a} = - \left[\frac{16C^2 a}{r^4} \right]$, and is equal to $\left| \frac{a_p}{\cos \varphi} \right|$, therefore the,
Centripetal-acceleration $a_p = - \frac{32C^2 a^2}{r^5} = - \frac{32\pi a^4 [1]}{T^2 r^4 [r^5]}$, and for $r = a$ then
 $\rightarrow a_p = - \left[\frac{32\pi}{T^2 r^5} \right]$, and the Force of cave, $r \equiv r_{A-KA}$, $F = - \left[\frac{32\pi m f^2}{r^5} \right] = - \left[\frac{32\pi \cdot S \cdot f^2}{v \cdot r^6} \right]$ **i.e.**

Newton-Force in a **Neutrino-cave** 10^{-18} m exhibits **Six-attractions** of different Strengths. These attractions are from the Strong Forces, $\{\oplus \leftrightarrow \oplus\}$, which differ in color as, **Quantum Chromodynamics**, analogous of change in Phase $\varphi = 0 \rightarrow 180^\circ$ as Photoelasticity. From equation $\sigma = \frac{v \rightarrow c}{\Phi^2}$ is seen that Stress **σ** is bonded between the velocity $\bar{v}$ and that of light $\bar{c}$. Gravitational-Force, for multiple close-together masses, follows the Electric, **Parallel - Connections - Resistors** inverse law and not the Additive. [83-89].

The old Perception for Negative-mass was a transient description of General-Relativity which tells that gravity is not a real force but is a warping of Space-time. The answer to this is that THERE IS NOT, Negative-Mass, NOT Space-time, **But** an Reaction to the – velocity - change and to Space-Energy. [39]

Concerning Gravity-Force $DE \equiv \bar{c} [\nabla i]$ is an Travelling-Energy-cave, **c**, with vector, **$\bar{c}$** . and goes away on Scales larger than Galaxy - Groups until that of generation, is predicted by Force in Voltage equation

$$V_c = r \cdot F_c \text{ and, Spin } \rightarrow S = \left[\frac{amc}{\pi} \right] = \bar{B} = \frac{2L}{w} = \frac{2L}{2\pi f} = \frac{\pi^2 r^4 \cdot f}{2}.$$

On **Scales Smaller** than Planck's Scale, **Space-Energy** as above, **acts** dominantly like the Newtonian gravity, while for **Scales Larger than Galaxy-Groups**, acts dominantly like The travelling Gravity-Force $\rightarrow DE \equiv \bar{c} [\nabla i]$. [72]

3... Electromagnetic-Forces :

Electricity is the motion of the Material-Points , and their relation .The **Three Elements** $\equiv$ Digits of The Material-Geometry are $\rightarrow \{ \oplus, [\oplus \leftrightarrow \ominus], \ominus \} \equiv \{ +, 0, - \} \leftarrow$ The **Permutation** , *arrangement* , of the Two Elements $P_1^2 = 2$, i.e. are $\rightarrow [\oplus, \ominus] - [\ominus, \oplus] \leftarrow$..The Three-Elements in Space need $P_1^3 = 3.(3-1).(3-2) = 6$ Positions and the same for the Three-Elements in Anti-Space need $P_1^3 = 3.(3-1).(3-2) = 6$ Positions , and Total Places $\rightarrow P_1^3 \cdot P_1^3 = 6 \times 6 = 36$ Positions for Spaces and Anti-Spaces as Impedance, and as before for $\log_x x$ and Base $x = 10$ then $\log_{10} 10 = 10^{10}$, and for the two elements $[\oplus, \ominus]$ the Growth is $\rightarrow 10^{[10]^2} = 10^{20}$ Positions $\equiv$ Distances $\equiv r$, and since issues $10^{-x} = \frac{1}{10^x}$ then

$$b = 36.10^{-20} , \text{ and } \rightarrow \bar{v} = \frac{F \Phi}{A} = \left[\frac{G \Phi}{A} \right] = \left[\frac{6,673692 \cdot 10^{-11} \cdot 1,6180339887}{36 \cdot 10^{-20}} \right] = 2,9995163 \cdot 10^8 \text{ m/s}$$

i.e. **Ubiquity of Material-Geometry in Electromagnetism** is $\bar{v}$, Instantly-Everywhere .

For Charges issues **Coulomb law** of Forces between Charges as $\rightarrow F_c = C \frac{q_1 \cdot q_2}{r^2}$, and the United Newton-Coulomb **Electro-Mechanical** Equation , $q \bar{B}_L = 2\pi m f$, for masses as the Resonance frequency

$$f_R = \sqrt[4]{\frac{1}{4\pi^2 m a^3}}$$
 between Charges and masses .The System $M_T =$ masses and $Q_T =$ Charges creates

a constant Magnetic-field with **Magnetic-field-Strength** $\bar{B}_F = \left| \frac{2\pi M_T}{Q_T} \right| f$

Energy in a cave is $\rightarrow E_K = \frac{k}{r} + \frac{L^2}{2m r^2} = \frac{k}{r} + \frac{L^2}{2 \left(\frac{s}{r \cdot w} \right) r^2} = \frac{\pi}{r} + \left\{ \frac{S w}{2} = \frac{c s}{2r} \right\} = \frac{\pi}{r} + \frac{c s}{2r}$, related to Spin-cave.

Dual-Photon $\bar{v} = \bar{c} \cdot [\bar{f}_n] + f_n$, is **Particle + Wave $\equiv$ Energy** moving with light-velocity and

its Duality exists in frequency . The Material - Points travel with velocities , $n \cdot \bar{c}$, and are as

$\bar{v}_m = n \cdot \bar{c} \cdot \{ [\bar{f}_n] + f_n \} \equiv \left[\frac{G}{\Phi^3 L_P} \right] \{ [\bar{f}_n] + f_n \}$, where $[\bar{f}_n]$ is the Stationary Storage and $[f_n]$ Travels as an

Propagating Electromagnetic-Radiation where motion $\equiv$ Energy $\equiv$ Wave as Electric-Force and is altered to the , **Space $\equiv$ Magnetic force** as , $\bar{E} = \bar{B} \cdot c$. The Propagating-Photon follows the velocity Dual-frequency Property

$\bar{v} = \lambda_n \cdot f_n = \bar{c} \cdot \left[\frac{\sigma}{2\pi r} + \frac{\sigma \Phi}{2\pi r} \right]$.. On the **Duality-Photon** $\{ \bar{c} \cdot [\bar{f}_n] + \bar{c} \cdot f_n \} \equiv \rightarrow$ Particle + Wave $\leftarrow$ issues ,
 $\bar{v} \cdot [\bar{f}_n] + f_n \equiv \left| \frac{v}{\pi^2 r^4 n} \right| \cdot [\bar{B}_n] + |\bar{c}| f_n$, or $\bar{v} \cdot [\bar{f}_n] = \left(n + \frac{1}{2} \right) \frac{\bar{c}}{2 \cdot |AK_A|} + [f_n = n \frac{\bar{v}}{2\lambda}] \equiv \bar{v} \left\{ \left| \frac{\bar{c}}{2 \cdot |AK_A|} \right| \left(n + \frac{1}{2} \right) + \frac{n}{2\lambda} \right\}$

Energy-Vectors on AK_A Prism $|Q \rightrightarrows_{AK_A} \leftarrow| \cdot |Q \uparrow \leftarrow_{AK_A} \uparrow| \cdot |AK_A| \equiv |Q_x \cdot Q_y| \cdot |AK_A| \equiv |\leftrightarrow| \cdot |\uparrow| \cdot |AK_A| \equiv k \pi r^3$.

From Wave-Energy-constant $k = \frac{2\pi}{\lambda} = \frac{2\pi f}{c} = \frac{w}{c} = \left| \frac{\bar{v}}{c} \right| \cdot |r_{A-KA}|$, then issues $c = \frac{w}{k} = \lambda f$ or $\left| \frac{\bar{c}}{2 \cdot |AK_A|} \right| \equiv f$

i.e. The frequency f_{AK_A} of Pipe $|AK_A|$ is the Stationary-Photon Energy-Storage $[\bar{f}_n] \equiv \left| \frac{\bar{c}}{2 \cdot |AK_A|} \right|$

a.. From equations $f = \frac{\sigma_1 \Phi}{2\pi r}$ and $\sigma_1 \cdot [1 \pm (\sqrt{5})] / 2 = \sigma \cdot \Phi$, then **Frequency f_p** of Photon is Independent of the Amplitude $[\epsilon E^2 + \mu B^2]$ of the Vibration , it is **Not-Damped and Not-Driven** , and so can be related to **Any-Force that can Produce Energy as Wave** and thus can be **Quantized to a Monad** .

b... **Photon** striking an Object of Microcosm or Macrocosm then becomes , a **Source** that **Gives Energy** as **Energy-Storage** , and **Information** as the **Propagating - Energy** . Photons offer an continuous input of light Energy , and this Process is The called Photosynthesis , i.e. it is the **Conversion of the Light-Energy-motion into Chemical-Energy** .

c... **Photon** in the Microcosm of Hydrogen-Cave can **Give** such **Potential-Energy as Resonance Energy-Frequency f_R** , as that needed for the Energy in [**Bracket – Orbit - Hook**] which **Joints the Atoms to Produce the Molecules** .

d... **Electric-Force** , $\leftrightarrow$, *is the Dominant where Particles are responding to the Constructive*

$[\oplus \rightarrow (+) \leftarrow \oplus]$ or $[\ominus \rightarrow (+) \leftarrow \ominus]$, and to **Destructive** $[\oplus \rightarrow (-) \rightarrow \ominus]$ **Interference** as ,

Constructive $[\oplus \rightarrow \oplus = \oplus \oplus] \equiv CI_{=+1}^{+,+} \equiv W^{+,+}$, $[\ominus \rightarrow \ominus = \ominus \ominus] \equiv CI_{=0-}^{-,-} \equiv W^{-,-}$,

Interference $\rightarrow [\oplus \rightarrow = \oplus] \equiv CI_{=+n}^{+,+} \equiv W^{+,+}$ 3-Types of **CI-Forces** .

Destructive $[\oplus \rightarrow \ominus = 0_+] \equiv DI_{=0+}^{+,-} \equiv Z^{+,-}$, $[\oplus \rightarrow \ominus = 0] \equiv DI_{=0}^{+,-} \equiv Z^0$,

Interference $\rightarrow [\oplus \rightarrow \ominus = 0_-] \equiv DI_{=0-}^{+,-} \equiv Z^{-,-}$ 3-Types of **DI-Forces** .

With the above Mould are Originated All Types of Elementary-Forces , Strong and Weak .

From equality $G \equiv \sigma \cdot \Phi^3$, is seen the Quantum - Chromodynamics , *dependent on stress σ* , and on Harmonic - ratio Φ , while the Quantum Electrodynamics Origin on Exchange Forces .

In each wave of , f , frequency and Newton-Force $F = - \left[\frac{32\pi m f^2}{r^5} \right]$ corresponds a stress $\sigma = \frac{F}{A} = \frac{2\pi r f}{\Phi}$,
 For a difference of cave $r = 0,1.10^{-18}$ then Force differs $F_{0,1} = 0,1.10^{-5}.10^{-18} = 10^{-24}$
 Because Force *can't exist by itself*, there must always be an equal and opposite Reaction Force , acting on the Opposite Position or Direction . **Coulomb - Force** acting between two Particles is $F_c = C \frac{q_1 q_2}{r^2}$, while the **Voltage** is $V_r = C \frac{q_1 q_2}{r}$ of cave , $r \equiv r_{\text{conductor}}$, and it is $\rightarrow V_r = F_c \cdot r \leftarrow \dots\dots(v)$

i.e. When Two Particles are in a cave , r , where $-\infty > r > 0$, *this cave is an Conductor* , then **Exists an Interaction between the two Particles** and this is the **Stress** , and the **Forces** as above and are the called **< color -forces >** , or **Electromotive-Charge-Forces** $\bar{F}_{AK_A} = F_{\text{color}}$

From Mechanics Displacement at x , is $x + dx$, and From Hook's law $\sigma = E u$, the ratio of Unit-Stress to Unit Strain is equal to the modulus of Elasticity E , and $\frac{\partial u}{\partial t} = \frac{\text{Force}}{A.E} = \frac{P}{A.E}$, and by differentiation $\rightarrow A.E. \frac{\partial^2 u}{\partial x^2} = \frac{\partial P}{\partial x}$.(1)
 For **Elementary-Forces** EM-Waves $|Q_{AK_A}| = \bar{Q}_0 \cdot \sin[kx - wt]$ and $|Q_{\uparrow AK_A}| = \bar{Q}_0 \cdot \sin[ky - wt]$ are the same to Electromagnetic Waves , i.e. of the same nature . Because Charges $\oplus, \ominus$ at Position $K_A \rightarrow A$, occupy Zero speeds Need acceleration force to Attack and so , **The accelerated-Charges Radiate Electromagnetic -Waves**. Everything consisted of **motion** , and **Reaction** to this motion , Executes **Vibration** Resulting to **Wave-motion** . Since equation (1) **issues for all Vibrations** , therefore **Elementary-Forces are of Electromagnetic-Nature** .

4.. Strong-Forces :

Strong - Forces are created on , **Markos-STPL** , in Pascal's and Desargues's Six-Triple-Point-Line **Points**.

Bosons are formed **Axially** In-Common-circle from $\oplus$ -Space , A, B, C , $\ominus$ -Anti-Space K_A, K_B, K_C , in Conductors $\rightarrow AK_A, BK_B, CK_C \leftarrow$ and acquire their , ± 1 Spin , from their Tangential-Conductors

$AK_C, AK_B - BK_A, BK_C - CK_B, CK_A$, on Unit-Energy-Quantities $Q_{\pm} = \frac{\bar{S}.g}{\sigma.r.\Phi} = \frac{\bar{S}.g}{\bar{c}.r} = \frac{\bar{S}.g}{2\pi.r.[f=1]}$... (2)

Because Force *can't exist by itself*, there must always be an equal and Opposite Reaction-force acting on the Opposite Position or Direction . When Two Particles are in a cave r , then exists an Interaction between the two.

The $\oplus$ Charged-Particle Produces an **Electric-field** $\bar{E}$, which exerts a force $\bar{F}$, on the other charged Particle creating The-**Constructive** , or the **Destructive-Interference** in an Homogenous Harmonic vibration Voltage as that of Dynamic Matrix $[\lambda M + K] X = 0$, where $\bar{\lambda} = 1/w^2 = 1/\lambda$ and $w = 2\pi f$.

Placing Magnetic field $\bar{B}_F = \frac{m.2\pi}{Q_+} f$, in Centripetal-Lorentz force $F = \bar{q}\bar{v} \cdot \bar{B}_F = \bar{q}\bar{v} \left[\frac{2\pi.m}{Q_+} f \right]$, becomes $F = 2\pi.\bar{q}\bar{v} \left[\frac{m}{mg} \right].f \equiv \frac{mv^2}{r} \equiv \frac{S.v}{r^2}$, since Spin $S = r m \bar{v}$, and $2\pi.\bar{q}\bar{v} \left[\frac{f}{g} \right] = \frac{\bar{v}.S}{r^2}$, or $\frac{2\pi\bar{q}}{g} r f = \frac{S}{r}$ and since frequency $f = \frac{\sigma.\Phi}{2\pi r}$ then $\rightarrow \frac{\bar{q}(\sigma\Phi)}{g} = \frac{S}{r}$, which becomes $\rightarrow r \cdot \sigma \cdot \bar{q}_{\text{cave}} = \frac{S.g}{\Phi} \leftarrow \dots(3)$
 From Angular-Momentum-Vector $\bar{B} = \pi^2 . r^4 f \equiv \text{Spin} \pm \bar{S}$ which is equal to $\frac{\pi r^3 \sigma}{2} [1 + \sqrt{5}] \equiv \pi r^3 . \sigma \Phi \equiv \left[\frac{h}{2\pi} \right] \equiv \frac{2L}{2\pi f}$, then Charge of cave , r , is $\rightarrow \bar{q}_{\text{cave}} = \frac{\bar{S}.g}{\sigma.r.\Phi} \equiv \frac{\bar{S}.g}{\bar{c}.r} \leftarrow \dots(q)$ i.e.

Above equation (q) relates the Inside existing , **Spin S** , of cave , r , where **Charges** $\bar{q}$ create the forces F . These Charges , $\pm \bar{q}$, { following Spin $\bar{S}$ are $\oplus$ or $\ominus$ } when are found in STPL Mechanism create the Coulomb-forces , F , which are either Repulsion or Attractive , and which **Forces Joint** the **Charges** , $\pm \bar{q}$, independently of **Charge-Type** , and so is done **The-Origin of the First Six-Forces and Anti-Forces** . The moving Charged Particle , $\oplus$ or $\ominus$, Produces a **Magnetic-field** $\bar{B}_F$, which exerts a Force $\bar{F}$ on other moving charges . **Any Obstacle** , or The Force $\bar{F}$ of these Charges is always Perpendicular to The Direction of their Velocity Vector so the **Velocity-magnitude** does not change while the **Direction** of the Velocity vector changes . By this way , **of the Two Transverse motions** , is created an **Electromagnetic Wave in Conductor** , $r = |AK_A|$, with Wavelength $\lambda = 2r$, on the Two or more Possible nodes of this Wave -Wavelength , i.e.
 Since a Wave is a Force $Q_{AK_A} = P = \oplus \Rightarrow |AK_A|$, an Energy-Vector $|Q \rightrightarrows_{AK_A}| \equiv |\leftrightarrow|$ that Propagates from the Place , *The Point A* , where it was created So , **When** is found an **Obstacle at Point K_A** , Then the Particles of the Conductor medium oscillate Perpendicular , IT IS THE - EXIT , to the direction of the **Wave-Propagation** , and by this Way continue motions and The - Longitudinal Wave in Conductor AK_A , becomes an **Transverse - Propagating -Wave** Or as an moving Energy-Vector , $|Q \uparrow \overleftarrow{AK_A}| = |\updownarrow|$.

The Obstacle at K_A Point, is *The Presentation of the*, $\oplus$ *constituent and the Absent of* $\ominus$ *constituent*.

Electromotive-Force $\rightarrow F = \bar{q} \bar{v} \times \bar{B}_F = Q_{\pm A} \rightarrow = \frac{v \cdot \bar{S}}{r^2} \equiv |\frac{c \cdot \bar{S}}{r^2}| \equiv G$, **The Elementary-Particles** $\leftarrow \{ \text{Forces} = F \text{ Leptons} = L, \text{ Quark} = Q \}$. Because Charges oscillate in the **Inner - Connectors** $\equiv$ **Conductors**, therefore, **Electromagnetic-Forces become** from the Oscillation of, $\oplus$, $\ominus$ **Charges in caves**, *Short-Range-Forces*, Proportional to the Positions these occupy in caves, $\bar{q}_{\text{Electron}} = \frac{G}{c \sqrt{2}}$, $\bar{q}_{\text{Cave}} = \frac{\bar{S} \cdot g}{\sigma \cdot r \cdot \Phi} \equiv \frac{\bar{S} \cdot g}{\bar{c} \cdot r} \equiv \frac{\bar{S} \cdot g}{w r^2}$ while for the Outer Tangential-Connectors become the **Electromagnetic-Forces**, *the Long-Range-Forces*, **Gamma-ray γ** .

5.. Weak-Forces :

Weak-Forces are created on, **Markos - STPL** line, in Pascal's and Desargues's Six-line-Points.

The $\oplus$ Breakage, being alternative at Space – Points, **A, B, C** $\rightarrow$ **Attacks** to the $\ominus$ **Charges** at Neutral-Space-Points **A_E, B_E, C_E** and forms The Strong **Leptons** $\{ e^-, \mu^+, \tau^+ \}$, $q = -1$ **Anti-Leptons** $\{ e^+, \mu^-, \tau^- \}$ and The Weak **Leptons** $\{ \nu_e, \nu_\mu, \nu_\tau \}$, with $q = \pm 0$, and Weak **Anti-Leptons** $\{ \bar{\nu}_e, \bar{\nu}_\mu, \bar{\nu}_\tau \}$, **ON STPL** Points **P_A, P_B, P_C**, respectively.

Because the $\oplus$ Breakage **Attacks** $\Rightarrow$ to the $\ominus$ **Charge**, thus Anti-Particles are Generated Only from the Opposite-motion, **Opposite-direction**, in their Conductors. $D, P \rightarrow I \leftarrow P, D$

Primary Particles occupying, mass **m**, exert Gravitational Attraction on each other. The Work Produced

by the Spin, **S**, increases the Charge $\bar{q}_{\text{Cave}}$ as $\rightarrow \frac{S(g)}{\Phi} \equiv r \cdot \sigma \cdot \bar{q}_{\text{Cave}}$

For the **Repulsion-Strong-Forces** $[\oplus \rightarrow = \oplus] \equiv CI \xrightarrow{+n} \equiv W^{++}$, and because in each Phase angle $\phi = 180^\circ$ the Energy increases and then is Presented The **< color - force >** as in Photoelasticity and thus is exerted **Attraction** via the **Strong –Nuclear - Force** which is the **Stress** $\rightarrow \sigma \equiv G / \Phi^3$. **Weak-Forces** $\{ W^+, \{ Z^{\pm 0} \}, \{ W^- \}$ are created in Conductors with vibration of Phase difference $+45^\circ$, and **Strong-Weak Leptons** of a Phase difference $-120^\circ, \pm 45^\circ$. For the case of Two Protons in Hydrogen-cave, these become Bound, and form Helium-Nucleus and because, **The Dynamic-Strip-Polygon**, doesn't close [exists $p + p = \rightarrow \rightarrow$], a Neutron is then needed to keep the Helium Nucleus Stable as Zero Resultant, $[p \rightarrow \emptyset \leftarrow p]$. A wide analysis in [91-92]

Summarize :

STPL - Circuit, is a **System** consisted of An **Voltage**, $U \equiv U_{AKA}, U_{AKB}, U_{AKC} \equiv$ Charges $[\oplus \rightarrow \ominus]$, and continuity of Voltage **U**, ensured Through the alternation of Charges, with 3-Phase Differences, angles $K_A K_B, K_B K_C, K_C K_A$, An, $\pm$ **Capacitor**, $C \equiv A - K_A, A - K_B, A - K_C \equiv [\oplus \cup \cup \ominus]$, and An **Inductor L** $\equiv$ Circuits $A - -K_A, A - -K_B, A - -K_C$, with currents, $i_{AKA} = C \frac{dU}{dt} = |AK_A| \{ \frac{dQ[AK_A]}{dt} \}$, $i_{AKB} = C \frac{dU}{dt} = |AK_B| \{ \frac{dQ[AK_B]}{dt} \}$, $i_{AKC} = C \frac{dU}{dt} = |AK_C| \{ \frac{dQ[AK_C]}{dt} \}$, Analogous to **{RLC circuit** of Charges $\oplus, \ominus$ as a **Three-Phase-Physical-Rotor**, becoming from the Three M-P-Elements, $\oplus, \ominus, \emptyset \equiv [\oplus \leftrightarrow \ominus] \equiv \{ +, 0, - \}$ This Physical-Rotor Creates $\rightarrow$ Strong and Weak Forces, Quarks and Anti-Quarks, Leptons and Anti-Leptons as

1.. Electromotive-Charge-Forces $\bar{F}_{AKA}$ as current $i = C \frac{dU}{dt} = AK_A \{ \frac{dQ[AK_A]}{dt} \} = 2|AK_A| \cos(\frac{\phi}{2}) \cdot \cos\{kx - wt + \phi/2\}$

For $\phi \rightarrow -2\pi, 0, 2\pi, 4\pi \dots 2N\pi$, **Create FROM Constructive-Interference** $i_{KA[C]} = 2|AK_A| \cdot [\cos(\frac{\phi}{2})] \cdot \cos[kx - wt]$

(1) **Strong-Forces** in Points **P**, AND from $\rightarrow \{ i = \frac{\Delta V}{R} \} = i_{KB(A)[C]} = 2|K_B A| \cdot [\cos(\frac{\phi}{2})] \cdot \cos[kx - wt]$, (2) **Strong**

Quarks in **D** with Charge $\bar{q} = \frac{+2}{3}$, WHILE - FROM, **Destructive-Interference** $\phi \rightarrow -1\pi, 0, 1\pi, 3\pi \dots N\pi$, (3)

The Anti-Strong Forces in Points **P**, and (4) **The Weak-Quarks** with Charge $\bar{q} = \frac{-1}{3}$ in Points **D**.

2.. Electromotive-Charge-Forces $\bar{F}_{AAE}$ as current $i = C \frac{dU}{dt} = AA_E \{ \frac{dQ[AA_E]}{dt} \} = 2|AA_E| \cos(\frac{\phi}{2}) \cdot \cos\{kx - wt + \phi/2\}$

For $\phi \rightarrow -2\pi, 0, 2\pi, 4\pi \dots 2N\pi$, **Create FROM Constructive-Interference**, $i_{KA[C]} = 2|AK_A| \cdot [\cos(\frac{\phi}{2})] \cdot \cos[kx - wt]$

(1) **The Weak-Forces** in Points **P**, AND from $\rightarrow i_{KB(A)[C]} = 2|K_B A| \cdot [\cos(\frac{\phi}{2})] \cdot \cos[kx - wt]$, The **Strong** and

The **Anti-Strong Leptons** in Points **P**, with Charge $\bar{q} = -1$, WHILE - FROM The **Destructive-Interference** For $\phi \rightarrow -1\pi, 0, 1\pi, 3\pi \dots N\pi$, (2) The **Weak** and The **Anti-Weak Leptons** in Points **P** with Charge $\bar{q} = \pm 0$.

The Table of Elementary Quantum-Chromodynamics-Forces and Quark-Particles :

STEP-1. Space $\equiv \oplus$, Anti-Space $\equiv \ominus$, Sub-Space or Neutral-Space $\equiv \emptyset$, At Positions F-26-27

1-State $\equiv$ Phase $\equiv$ Positions, **Charges** $\oplus \equiv A, B, C$ - **Charges** $\ominus \equiv K_A, K_B, K_C$ - **Positions** $\emptyset \equiv A_E, B_E, C_E$,

MAGNET $\Rightarrow \Rightarrow [\oplus \rightarrow \ominus]$, On Conductors $\overrightarrow{AK_A}, \overrightarrow{BK_B}, \overrightarrow{CK_C}$, Exert Electromotive-Forces $Q^{\pm\pm}$, Launched Into the Low-Voltage STPL-Points P_{A-B-C}, D_{A-B-C} , Forms Quantum-Chromodynamics-Forces and Particles

- 1... $\oplus A \Rightarrow \Rightarrow \ominus K_A \equiv \overrightarrow{AK_A} \equiv q^+ = \frac{2}{3}, \varphi = \pm 0 \rightarrow Q \Rightarrow \overrightarrow{AK_A}$, At $[+P_A] \rightarrow$ Strong-Chromo-Force $Q^+ \leftarrow$
- 2... $\oplus A \Rightarrow \Rightarrow \ominus K_B \equiv \overrightarrow{AK_B} \equiv q^+ = \frac{2}{3}, \varphi = +90 \rightarrow Q \Rightarrow \overrightarrow{AK_B}$, At $[-D_A] \rightarrow$ Strong-Anti Up-Quark $\bar{u} \leftarrow$
- 3... $\oplus A \Rightarrow \Rightarrow \ominus K_C \equiv \overrightarrow{AK_C} \equiv q^+ = \frac{2}{3}, \varphi = -90 \rightarrow Q \Rightarrow \overrightarrow{AK_C}$, At $[+D_A] \rightarrow$ Strong Up-Quark $u \leftarrow$
- 4... $\oplus B \Rightarrow \Rightarrow \ominus K_B \equiv \overrightarrow{BK_B} \equiv q^+ = \frac{2}{3}, \varphi = \pm 0 \rightarrow Q \Rightarrow \overrightarrow{BK_B}$, At $[-P_B] \rightarrow$ Strong - Chromo- Force $C^{\mp 0} \leftarrow$
- 5... $\oplus B \Rightarrow \Rightarrow \ominus K_C \equiv \overrightarrow{BK_C} \equiv q^+ = \frac{2}{3}, \varphi = -90 \rightarrow Q \Rightarrow \overrightarrow{BK_C}$, At $[-D_B] \rightarrow$ Strong-Anti-Charm-Quark $\bar{c} \leftarrow$
- 6... $\oplus B \Rightarrow \Rightarrow \ominus K_A \equiv \overrightarrow{BK_A} \equiv q^+ = \frac{2}{3}, \varphi = +90 \rightarrow Q \Rightarrow \overrightarrow{BK_A}$, At $[+D_B] \rightarrow$ Strong Charm-Quark $c \leftarrow$
- 7... $\oplus C \Rightarrow \Rightarrow \ominus K_C \equiv \overrightarrow{CK_C} \equiv q^+ = \frac{2}{3}, \varphi = \pm 0 \rightarrow Q \Rightarrow \overrightarrow{CK_C}$, At $[-P_C] \rightarrow$ Strong-Anti-Chromo-Force $D^- \leftarrow$
- 8... $\oplus C \Rightarrow \Rightarrow \ominus K_A \equiv \overrightarrow{CK_A} \equiv q^+ = \frac{2}{3}, \varphi = -90 \rightarrow Q \Rightarrow \overrightarrow{CK_A}$, At $[+D_C] \rightarrow$ Strong - Top - Quark $t \leftarrow$
- 9... $\oplus C \Rightarrow \Rightarrow \ominus K_B \equiv \overrightarrow{CK_B} \equiv q^+ = \frac{2}{3}, \varphi = +90 \rightarrow Q \Rightarrow \overrightarrow{CK_B}$, At $[-D_C] \rightarrow$ Strong-Anti-Top -Quark $\bar{t} \leftarrow$

2-State $\equiv$ Phase $\equiv$ Positions, **Charges** $\oplus \equiv A, B, C$ - **Charges** $\ominus \equiv K_A, K_B, K_C$ - **Positions** $\emptyset \equiv A_E, B_E, C_E$,

MAGNET $\Rightarrow \Rightarrow [\oplus \rightarrow \ominus]$, On Conductors $\overrightarrow{K_A A}, \overrightarrow{K_B B}, \overrightarrow{K_C C}$, Exert Electromotive-Forces $Q^{\pm\pm}$, Launched Into the Low-Voltage STPL-Points P_{A-B-C}, D_{A-B-C} , Forms Quantum-Chromodynamics-Forces and Particles

- 1... $\oplus K_A \Rightarrow \Rightarrow \ominus A \equiv \overrightarrow{K_A A} \equiv q^- = \frac{1}{3}, \varphi = \pm 0 \rightarrow Q \Rightarrow \overrightarrow{K_A A}$, At $[-P_A] \rightarrow$ Anti-Strong-Chromo-Force $Q^- \leftarrow$
- 2... $\oplus K_A \Rightarrow \Rightarrow \ominus B \equiv \overrightarrow{K_A B} \equiv q^- = \frac{1}{3}, \varphi = +30 \rightarrow Q \Rightarrow \overrightarrow{K_A B}$, At $[-D_B] \rightarrow$ Anti-Strange - Quark $\bar{s} \leftarrow$
- 3... $\oplus K_A \Rightarrow \Rightarrow \ominus C \equiv \overrightarrow{K_A C} \equiv q^- = \frac{1}{3}, \varphi = -30 \rightarrow Q \Rightarrow \overrightarrow{K_A C}$, At $[-D_C] \rightarrow$ Anti- Bottom - Quark $\bar{b} \leftarrow$
- 4... $\oplus K_B \Rightarrow \Rightarrow \ominus B \equiv \overrightarrow{K_B B} \equiv q^- = \frac{1}{3}, \varphi = \pm 0 \rightarrow Q \Rightarrow \overrightarrow{K_B B}$, At $[+P_B] \rightarrow$ Anti-Strong-Chromo-Force $C^{0\pm} \leftarrow$
- 5... $\oplus K_B \Rightarrow \Rightarrow \ominus C \equiv \overrightarrow{K_B C} \equiv q^- = \frac{1}{3}, \varphi = -30 \rightarrow Q \Rightarrow \overrightarrow{K_B C}$, At $[+D_C] \rightarrow$ Weak- Bottom - Quark $b \leftarrow$
- 6... $\oplus K_B \Rightarrow \Rightarrow \ominus A \equiv \overrightarrow{K_B A} \equiv q^- = \frac{1}{3}, \varphi = +30 \rightarrow Q \Rightarrow \overrightarrow{K_B A}$, At $[+D_A] \rightarrow$ Weak- Down - Quark $d \leftarrow$
- 7... $\oplus K_C \Rightarrow \Rightarrow \ominus C \equiv \overrightarrow{K_C C} \equiv q^- = \frac{1}{3}, \varphi = \pm 0 \rightarrow Q \Rightarrow \overrightarrow{K_C C}$, At $[+P_C] \rightarrow$ Anti-Strong-Chromo-Force $0 D^+ \leftarrow$
- 8... $\oplus K_C \Rightarrow \Rightarrow \ominus A \equiv \overrightarrow{K_C A} \equiv q^- = \frac{1}{3}, \varphi = -30 \rightarrow Q \Rightarrow \overrightarrow{K_C A}$, At $[-D_A] \rightarrow$ Anti - Down - Quark $\bar{d} \leftarrow$
- 9... $\oplus K_C \Rightarrow \Rightarrow \ominus B \equiv \overrightarrow{K_C B} \equiv q^- = \frac{1}{3}, \varphi = +30 \rightarrow Q \Rightarrow \overrightarrow{K_C B}$, At $[+D_B] \rightarrow$ Weak- Strange - Quark $s \leftarrow$

The Table of Elementary Weak-Forces and Lepton -Particles :

STEP-1 . Space $\equiv \oplus$, Anti-Space $\equiv \ominus$, Sub-Space or Neutral-Space $\equiv \emptyset$, At Positions F-28-29

1-State $\equiv$ Phase $\equiv$ Positions, **Charges** $\oplus \equiv A, B, C$ - **Charges** $\ominus \equiv A_E, B_E, C_E$ - **Positions** $\emptyset \equiv K_A, K_B, K_C$

MAGNET $\Rightarrow \Rightarrow [\oplus \rightarrow \ominus]$, On Conductors $\overrightarrow{AA_E}, \overrightarrow{BB_E}, \overrightarrow{CC_E}$, Exert Electromotive-Forces $Q^{\pm\pm}$, Launched Into the Low-Voltage STPL-Points P_{A-B-C} , Forms Weak -Forces and Strong-Leptons-Particles

- 1... $\oplus A \Rightarrow \Rightarrow \ominus A_E \equiv \overrightarrow{AA_E} \equiv q^- = -1, \varphi = \pm 0 \rightarrow Q \Rightarrow \overrightarrow{AA_E}$, At $[+P_A] \rightarrow$ Weak - Force $W^+ \leftarrow$
- 2... $\oplus A \Rightarrow \Rightarrow \ominus B_E \equiv \overrightarrow{AB_E} \equiv q^- = -1, \varphi = -45 \rightarrow Q \Rightarrow \overrightarrow{AB_E}$, At $[+P_C] \rightarrow$ Strong -Tau-Lepton $\tau \leftarrow$
- 3... $\oplus A \Rightarrow \Rightarrow \ominus C_E \equiv \overrightarrow{AC_E} \equiv q^- = -1, \varphi = +45 \rightarrow Q \Rightarrow \overrightarrow{AC_E}$, At $[+P_B] \rightarrow$ Strong -Muon-Lepton $\mu \leftarrow$
- 4... $\oplus B \Rightarrow \Rightarrow \ominus B_E \equiv \overrightarrow{BB_E} \equiv q^- = -1, \varphi = \pm 0 \rightarrow Q \Rightarrow \overrightarrow{BB_E}$, At $[-P_B] \rightarrow$ Weak - Force $Z^{+0} \leftarrow$
- 5... $\oplus B \Rightarrow \Rightarrow \ominus C_E \equiv \overrightarrow{BC_E} \equiv q^- = -1, \varphi = -45 \rightarrow Q \Rightarrow \overrightarrow{BC_E}$, At $[-P_A] \rightarrow$ Strong - Electron $e^- \leftarrow$
- 6... $\oplus B \Rightarrow \Rightarrow \ominus A_E \equiv \overrightarrow{BA_E} \equiv q^- = -1, \varphi = +45 \rightarrow Q \Rightarrow \overrightarrow{BA_E}$, At $[+P_C] \rightarrow$ Strong-Anti-Tau $\bar{\tau} \leftarrow$
- 7... $\oplus C \Rightarrow \Rightarrow \ominus C_E \equiv \overrightarrow{CC_E} \equiv q^- = -1, \varphi = \pm 0 \rightarrow Q \Rightarrow \overrightarrow{CC_E}$, At $[-P_C] \rightarrow$ Weak - Force $W^- \leftarrow$
- 8... $\oplus C \Rightarrow \Rightarrow \ominus A_E \equiv \overrightarrow{CA_E} \equiv q^- = -1, \varphi = -45 \rightarrow Q \Rightarrow \overrightarrow{CA_E}$, At $[+P_B] \rightarrow$ Strong-Anti-Muon $\bar{\mu} \leftarrow$

$$9... \oplus C \Rightarrow \ominus B_E \equiv \overrightarrow{CB_E} \equiv q^- = -1, \varphi = +45 \rightarrow \mathbf{Q} \Rightarrow \overrightarrow{CA_E}, \text{ At } [-P_A] \rightarrow \text{Strong - Positron} \quad \mathbf{e}^+ \leftarrow$$

2-State $\equiv$ Phase $\equiv$ Positions, **Charges** $\oplus \equiv A_E, B_E, C_E$, **Charges** $\ominus \equiv A, B, C$ - **Positions** $\emptyset \equiv K_A, K_B, K_C$
 MAGNET $\Rightarrow [\oplus \rightarrow \ominus]$, On Conductors $\overrightarrow{A_E A}, \overrightarrow{B_E B}, \overrightarrow{C_E C}$, Exert Electromotive-Forces $\mathbf{Q}^{\mp \Rightarrow}$, Launched
 Into the Low-Voltage STPL-Points P_{A-B-C} , Forms Weak - Forces and Weak-Neutrino-Leptons-Particles

$$\begin{aligned} 1... \oplus A_E \Rightarrow \ominus A \equiv \overrightarrow{A_E A} \equiv q^- = -1, \varphi = \pm 0 \rightarrow \mathbf{Q} \Rightarrow \overrightarrow{A_E A}, \text{ At } [-P_A] \rightarrow \text{Anti - Weak- Force} \quad \mathbf{W}^- \leftarrow \\ 2... \oplus A_E \Rightarrow \ominus B \equiv \overrightarrow{A_E B} \equiv q^- = -0, \varphi = -45 \rightarrow \mathbf{Q} \Rightarrow \overrightarrow{A_E B}, \text{ At } [-P_C] \rightarrow \text{Tau-Neutrino} \quad \mathbf{v}_\tau \leftarrow \\ 3... \oplus A_E \Rightarrow \ominus C \equiv \overrightarrow{A_E C} \equiv q^- = +0, \varphi = +45 \rightarrow \mathbf{Q} \Rightarrow \overrightarrow{A_E C}, \text{ At } [-P_B] \rightarrow \text{Anti-Muon-Neutrino} \quad \overline{\mathbf{v}}_\mu \leftarrow \\ 4... \oplus B_E \Rightarrow \ominus B \equiv \overrightarrow{B_E B} \equiv q^- = -1, \varphi = \pm 0 \rightarrow \mathbf{Q} \Rightarrow \overrightarrow{B_E B}, \text{ At } [P_B] \rightarrow \text{Anti-Weak - Force} \quad \mathbf{Z}^{0+} \leftarrow \\ 5... \oplus B_E \Rightarrow \ominus C \equiv \overrightarrow{B_E C} \equiv q^- = 0-, \varphi = -45 \rightarrow \mathbf{Q} \Rightarrow \overrightarrow{B_E C}, \text{ At } [+P_A] \rightarrow \text{Anti-Electro-Neutrino} \quad \overline{\mathbf{v}}_e \leftarrow \\ 6... \oplus B_E \Rightarrow \ominus A \equiv \overrightarrow{B_E A} \equiv q^- = 0+, \varphi = +45 \rightarrow \mathbf{Q} \Rightarrow \overrightarrow{B_E A}, \text{ At } [-P_C] \rightarrow \text{Anti-Tau-Neutrino} \quad \overline{\mathbf{v}}_\tau \leftarrow \\ 7... \oplus C_E \Rightarrow \ominus C \equiv \overrightarrow{C_E C} \equiv q^- = -1, \varphi = \pm 0 \rightarrow \mathbf{Q} \Rightarrow \overrightarrow{C_E C}, \text{ At } [+P_C] \rightarrow \text{Anti-Weak - Force} \quad \mathbf{W}^+ \leftarrow \\ 8... \oplus C_E \Rightarrow \ominus A \equiv \overrightarrow{C_E A} \equiv q^- = -0, \varphi = -45 \rightarrow \mathbf{Q} \Rightarrow \overrightarrow{C_E A}, \text{ At } [-P_B] \rightarrow \text{Muon - Neutrino} \quad \mathbf{v}_\mu \leftarrow \\ 9... \oplus C_E \Rightarrow \ominus B \equiv \overrightarrow{C_E B} \equiv q^- = +0, \varphi = +45 \rightarrow \mathbf{Q} \Rightarrow \overrightarrow{C_E B}, \text{ At } [+P_A] \rightarrow \text{Electron - Neutrino} \quad \mathbf{v}_e \leftarrow \end{aligned}$$

Remarks :

The Genesis of Geometry-Units $\equiv$ The Quantum of Spaces , IN Three-Poles Rotational-Squares-System.

For two Points A , B , Is the Segment $\overrightarrow{AB}$ as Distance $|\overrightarrow{AB}|$, For three Points A , B , C , consisting the Plane ,Is
 The circumscribed-circle of radius r ,and of Square $r\sqrt{2}$,with Unit-Area $= \pi .r^2$, For four Points A , B , C ,D ,
 Not coinciding and not in Plane , Is the **Regular-Tetrahedron** of Side a , Surface Area $A = a^2 .\sqrt{3}$, Volume $V = \frac{a^3}{6\sqrt{2}}$,
 Ex-Sphere Radius $r_E = \frac{a}{\sqrt{6}}$ and Volume $V_E = \frac{2\pi .a^3}{9\sqrt{6}}$, In-Sphere Radius $r_I = \frac{a}{2\sqrt{6}}$ and Volume $V_I = \frac{\pi .a^3}{36\sqrt{6}}$,
 and Ratio $\frac{V_E}{V_I} = 8$ or $V_E = 8 . V_I = 2^3 . V_I = [2L_T]^3$. This Property may be used in Electronics when Four Equal
 Resistors are Placed on the Vertices of an Regular Tetrahedron ,and then the Resistance measured Between Any
 Two Vertices is Half that of One-Resistor .This Property Spring from the Duplication of above Energy-Cube of
 Stresses Geometry-Units which are Formulated in the **Three Poles Rotational System** , [TPRS] Figure - 59 .
 In Page 149 , The Pivot-Resultant-Charge issues on the Regular-Polygons as in [63] .

The Genesis of Energy-Units $\equiv$ The Quantum of motion $\equiv$ Energy , In [STPL-C] –Mechanism.

Since Energy $\equiv$ motion = Force x d = $\sigma A d = [\sigma d] . A = |\overrightarrow{Q} \Rightarrow| . A$, Implies The capture of motion in this Space
 Volume d A . The Least motion happens in the Physical Magnet of Space $\oplus$, and Anti-Space $\ominus$. The **Energy
 Flow-Rate** between the **Spaces** and **Anti-Spaces** at **Every-Time** , i.e. *The In-between Conductors* $[\oplus \leftarrow r \rightarrow \ominus]$
distance is that of Magnets , **Becomes** from the **Coulomb-Forces** which follow The **Ptolemy's - Theorem** and ,
 from $\pm$ **Spin** following **Cebas -Theorem** for the **System's-Equilibrium** .The Conductor's - Force is A **Moving**
 simultaneously **Rotating Energy-Quantity $\equiv$ Electromotive-Force** which builds **The-Cosmic-Particles** . (I)

J... THE ATOMS - BONDING

1-j.. Energy and Motion in General

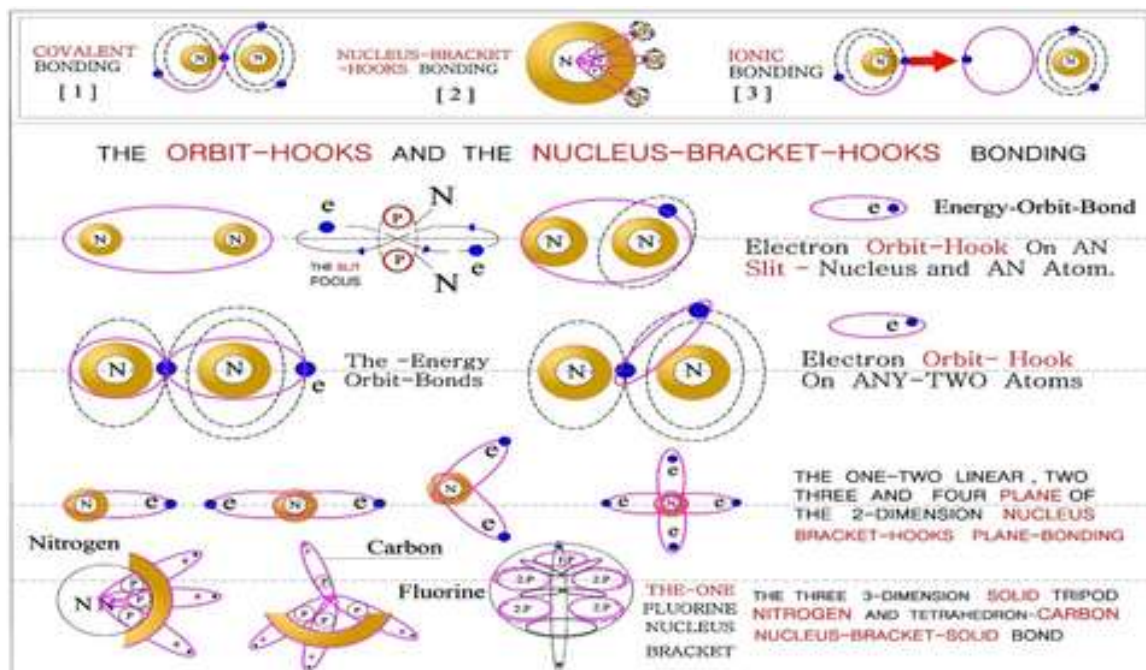


Figure – 36- : The Types of Atoms - Bonding .

The Motion in Mechanics is expressed by the equation of velocity $\rightarrow \bar{v} = \frac{ds}{dt} = \text{constant} \leftarrow$ from a Point A to a Point B, meaning that the Change of $ds = d(AB)$, in time is constant, or is analogous to an index, a , as equation $\bar{v} = \frac{ds}{dt} = a s$, or $\frac{ds}{s} = a dt \dots (1)$. By Integration then $\rightarrow \ln\left(\frac{ds}{s}\right) = a t$, where $C =$ the constant of Integration, and (1) becomes, $\frac{s}{C} = e^{at}$, or $s = C e^{at} \dots (2)$

For $s = 0$, then equation (2) is at the beginning of motion and so $\rightarrow C e^{at} = 0$, with solution $t = -\infty$ i.e.

Motion does Not Exist, and Existed **Only when it was in the Deep - Past, which is Invalid**.

Atoms are Energy Monads which need a Type of Magnet in order to Bond or from Coulomb-Force an Voltage $V_r = F_c r$, where $F_c =$ The Coulomb force and $r =$ Displacement.

Since Bonding may exist in the Three Geometry-dimensions, Segments, Plane, Volume, so **Exist** in their **Quantum of Spaces** as, $|\overline{AB}|$ Distance, $|r.\sqrt{2}|$ Square $= r \times r$, $\frac{a^3}{6\sqrt{2}}$ Regular-Tetrahedron of Side a , of Ratio $\frac{V_E}{V_I} = 8 = \text{Ex-Sphere Volume} / \text{In-Sphere Volume}$, or $V_E = 8 \cdot V_I = 2^3 \cdot V_I = [2L_T]^3$. From above Quantum of Energy become all Types of Bonds, **The Nucleus Fixed-Brackets-Hooks**, as in [4-j] Bonding-Mechanism.

Motion in Material-Geometry is the equation of Primary Point, A, which is the only Space, and on it exists the Principle of Virtual Displacements $W = \int_A^B P \cdot ds = 0$, or $[ds \cdot (P_A + P_B) = 0]$, i.e. for any monad $ds > 0$ Impulse $P = (P_A + P_B) = 0$ and $[ds \cdot (P_A + P_B) = 0]$, Therefore, Each Unit $AB = ds > 0$, $[\oplus \leftrightarrow \ominus]$, exists by this Inner Impulse (P) where issues $\rightarrow P_A + P_B = 0$, or $P_A \equiv -P_B$.

Applying this logic on any, **Two caves**, either Ellipse or Circular, at their Common Point, B, [F-37] then to exist Orbital-Bonding, $(AB) \leftrightarrow (BC)$, at common Point, B, of the two Electron - Orbits 1, 2 Then is **Needed the Balancing of the Spaces** (AB), (BC), and the **Stability of Velocities** $v_{B r1}$, $v_{B r2}$.

To succeed this, the Velocity $\bar{v}_{e2}$ at Point B, must be in the tangential-Plane of (BC) at this Point B, where the Velocity-Vector $\bar{v}_{e2}$ **Bisects** the Outer angle of, $r_1 - r_2$, Rays. Because Point B is common to the two Spaces, is provided (AB) Space to be on a Sphere such that it is tangential to the F_c , F_w , Energy - Plane. By this way the **Energy-Velocity-Vector**, $\bar{v}_{e1}$ of (AB) Electron-cave, **Passes into** the Space-cave (BC) which is the **Centripetal-Force -Vector** $\bar{F}_c$, and where issues $\bar{v}_{e+r1} + \bar{v}_{e+r2} = 0$.

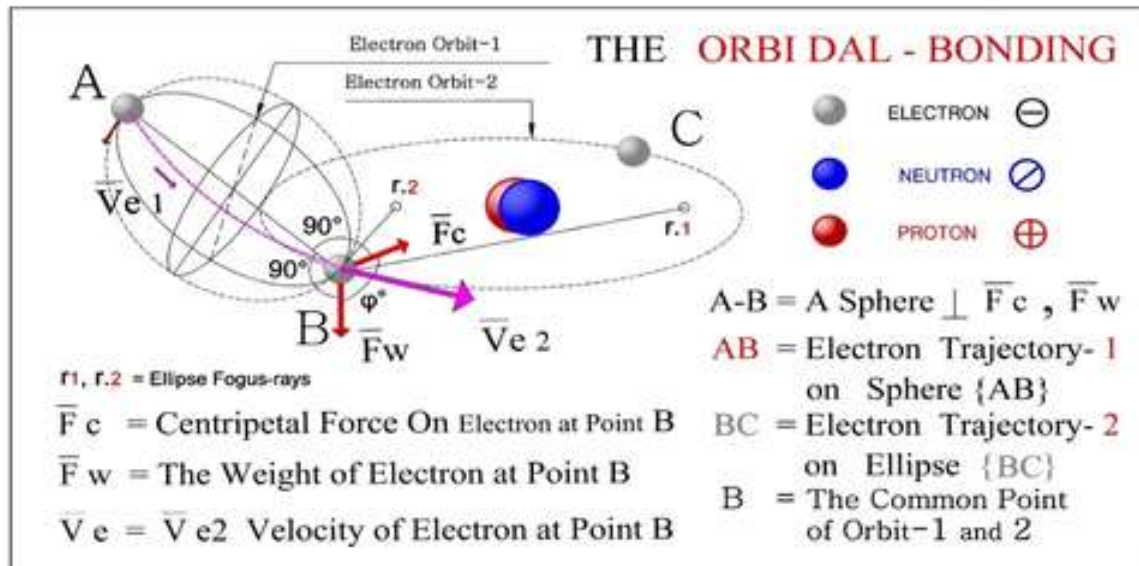


Figure – 37- : The Balancing Orbital-Bonding between , Orbit-1 $\rightarrow \vec{v}_{e1}$ and Orbit-2 $\rightarrow \vec{v}_{e2}$:

From all trajectories on *Sphere* [AB, R], the *Transverse-Plane* at common Point B, which is Perpendicular to Vector $\vec{v}_{e2}$ and in which Plane lies the Resultance of the Centripetal- $\vec{F}_c$ and Weight - $\vec{F}_w$ Vector, *it is the Balancing of Space and Motion*, i.e. $\rightarrow$ **The Path for Bonding**. The *Transverse-Plane* forms an angle, ϕ , to Plane, B_{r1}, B_{r2} , of the Centripetal - $\vec{F}_c$. Since Transverse-Plane is Perpendicular to $\vec{v}_{e2}$, then the Component-Velocities are zero and the sum of velocity vectors $\vec{v}_{e+r1} + \vec{v}_{e+r2} = 0$ lie on $\vec{v}_{B r1}, \vec{v}_{B r2}$ Vectors or the *Stability of Velocities*.

2-j.. The Orbital Bonding -Mechanism :

From Priors, a Material-Point A, *Electron, Neutron, Proton*, may exist on a Straight-line or in a Conic-section-Cave r , and can reach an Point B. According to E-Geometry (Pascal), the minimum trajectory occurs on a Sphere of radius R, provided that Centripetal Force at Point B is Perpendicular to the Tangential-Plane, $[\vec{v}_e, \vec{F}_w]$, differently to Proceeded-Plane. Because in any circular motion, the Centripetal Force-Vector is, $\vec{F}_c = \frac{mv^2}{r}$, weight Vector $\vec{F}_w = mg$, and then the reaction on trajectory is Perpendicular to their Plane, therefore the inclination of this Plane for equilibrium

$$\text{is } \tan \theta = \frac{F_c}{F_w} = \frac{v^2}{rg} = \frac{[2,9979 \cdot 10^8]^2}{2,1127839 \cdot 10^{-11} \cdot 9,8077} = 0,4337236 \cdot 10^{27} = 4,337236 \cdot 10^{26} \text{ and } \theta \cong 90^\circ.$$

In case where this **Tangential-Plane** $[\vec{v}_{e1}, \vec{F}_w]$ of 1-Space is common to another 2-Space as $[\vec{v}_{e2}, \vec{F}_w]$ then exists a **Balancing** between the two Spaces, 1, 2, and velocity vector $\vec{v}_{e2}$ bisects the Outer angle of the Ellipse $r_1 - r_2$ rays. or is Perpendicular to the circle-radius, r .

Because the Projections of **Velocity-Vector** $\vec{v}_{e1}, \vec{v}_{e2}$ are equal then $\vec{v}_{e+r1} = -\vec{v}_{e+r2}$ and **Energy-Velocity-Vector** $\vec{v}_{e1}$ of Space -1 Passes to Space -2 as **Centripetal- Force -Vector** $\vec{F}_c$,

The Total-Energy for Unit-mass in caves is $\rightarrow E = K_E + P_E = (\frac{1}{2}) \cdot \dot{x}^2 + U(x) = \text{constant}$.

The Ordinate of the, **Phase-Plane**, is given by Planar equation, $\vec{v}_e \equiv \dot{x} = \pm \sqrt{2[E - U(x)]}$, and for Electron velocity $\dot{x} = 0$, *it is the moment where Electron is quitting Orbit-1*, and then energy $E = U(x)$,

i.e.. The Total Energy E of cave is equal to the **Potential energy** $U(x)$ only, and The [AB], **Plane-Bracket**, is a **Void-Space**, as that of the Hydrogen-cave.

3-j.. The Equilibrium of Orbital Bonding :

In Figure-33-, the Material-Point (Electron) moves under the action of, $\vec{F}_e(X, Y, Z)$ **Force Magnetic field**, On **Transverse-Plane**, $f(x, y, z)$, which forms an angle, θ , with Plane B_{r1}, B_{r2} . **To Show the System's - Balancing-Positions** when $\delta x, \delta y, \delta z$, are the Possible-motions.

The equilibrium equations for the Forces acting on the Plane are as,

$$\bar{F}_e = X \delta x + Y \delta y + Z \delta z = 0, \quad \dots(a)$$

$$\frac{\partial f}{\partial x} \delta x + \frac{\partial f}{\partial y} \delta y + \frac{\partial f}{\partial z} \delta z = 0 \quad \dots(b)$$

By multiplication of (b) with the parameter λ , and are added to (a) and $\delta x = \delta y = \delta z = 0$ for motionless, then become the equations of equilibrium at the, x, y, z , Positions as,

$$X + \lambda \frac{\partial f}{\partial x} = 0, \quad Y + \lambda \frac{\partial f}{\partial y} = 0, \quad Z + \lambda \frac{\partial f}{\partial z} = 0, \quad \dots(c)$$

The Reaction-Force $\bar{F}_R = [\lambda \frac{\partial f}{\partial x}, \lambda \frac{\partial f}{\partial y}, \lambda \frac{\partial f}{\partial z}]$ is the Equilibrium to $\bar{F}_e(X, Y, Z)$, force which direction is Perpendicular to **Transverse-Plane**, $f(x, y, z) \dots O\epsilon\delta$, and as before angle $\theta \cong 90^\circ$. Stress, σ , occupies Minimum and Maximum because is related to the frequency and velocity as,

$$f_{ph} = [\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}] \equiv \frac{\sigma + \sigma\Phi}{2\pi r} = \frac{\sigma[1+\Phi]}{2\pi r} = \frac{\sigma[\Phi]^2}{2\pi r}, \text{ or } \sigma \equiv \frac{f_{ph} \cdot 2\pi r}{\Phi^2} \equiv \frac{w \cdot r}{\Phi^2} \equiv \frac{v}{\Phi^2} \equiv \bar{c} \frac{1}{\Phi^2},$$

It is **The-Stress-Way** of Photon-Storages, $\bar{f}_N = \sigma/2\pi r$, and **Photon-Information** $f_n = \sigma\Phi/2\pi r$.

From force, $G \equiv \sigma \cdot \Phi^3 = \Phi^2 \cdot [\sigma\Phi] \equiv [\frac{2B}{\pi r^3}] \equiv 2\pi f_p r \equiv w r \equiv \bar{v} \equiv m a = m g = \bar{c}$, then Stress is

$$\bar{\sigma} \equiv \frac{\bar{F}}{A} \equiv [\sigma\Phi] \equiv [\frac{2B}{\pi r^3}] \equiv 2\pi \cdot f_p r \equiv w r \equiv \bar{v} \equiv m a = m g = \bar{c} \text{ is dependent on Total-Prior.}$$

As soon as Area, $A \equiv \bar{\sigma}\Phi \equiv \{\text{The Space + Anti-Space Positions in Universe}\}$, become **Inadequate** for any **min-Energy-Storage**, $A = e^{-i(\frac{\pi}{2})} \cdot b = 0, 207879576$. $b = 1,507 \cdot 10^{-7} \text{ m}$, then **Motion $\equiv$ Energy is at first filling the minimum cave** $r = 1,507 \cdot 10^{-7} \text{ m}$ and with the Necessary **Velocity-Vectors, Burst - Into another greater cave** $a > A = 1,507 \cdot 10^{-7} \text{ m}$, in L_p , and ARE **connected to G**, which would make it **Stable, by an Overflow of the Energy in the Space + Anti-Space Positions, and is Ionic Bond** [58].

From relation $E_{ph} \equiv \bar{c} \cdot [\bar{f}_n + f_n]$ is seen the Storages $\bar{c} \cdot [\bar{f}_n]$, and from $\bar{q}_{\text{Photon}} \equiv \frac{\bar{c} \cdot \sigma \Phi}{2\pi r} \equiv \frac{\bar{w} \cdot \sigma \Phi}{2\pi} \equiv$
The Stresses of the Information-Photons where Overflow is in Anti-Quadrature.

a.. Example :

Fluoride, F, has 7 outer Shell Electrons and needs 1, to reach the max-8- Permutations of their Energy level. This 1 electron can be gained from the 1 Outer Shell of Lithium, Li, or, from one Carbon and, of 4 Fluoride where then becomes the, $C - F_{4 \text{ Solid}}^D$ Bond.

4-j.. The Nucleus Bonding -Mechanism :

a.. Because motion of Atoms in a **Conservative System** is expressed in terms of Lagrange's,

Generalized coordinates, so exists and for their Bonding. From equation $\frac{d}{dt} (\frac{\partial L}{\partial \dot{q}_1}) - \frac{\partial L}{\partial q_1} = 0$

and applying Kinetic-energy as $L = (1/2) \cdot m[\dot{x}^2 + \dot{y}^2 + \dot{z}^2]$, so that $\frac{\partial L}{\partial \dot{q}_1} = \frac{\partial L}{\partial \dot{q}_2} = \frac{\partial L}{\partial \dot{q}_3} = 0$ and

$\frac{\partial L}{\partial \dot{q}_1} = m\dot{x}$, $\frac{\partial L}{\partial \dot{q}_2} = m\dot{y}$, $\frac{\partial L}{\partial \dot{q}_3} = m\dot{z}$, then Lagrange's equations of the Second-Kind are,

$m\ddot{x} = Q_x$, $m\ddot{y} = Q_y$, $m\ddot{z} = Q_z$, and if the **Transverse-Plane** forms an angle, ϕ , to Plane

B_{r1} , B_{r2} , as $\rightarrow \phi = wt \leftarrow$, then equation of motion becomes, $\frac{d}{dt} (m\dot{r}) - m\dot{r} \cdot w^2 = 0$, and

for the (i) masses issues **The motion of Unit-material-Point** $\rightarrow \ddot{r} = r \cdot w^2 \dots(m)$

This motion happens on, **Slit-Nucleus { Bracket- Orbit- Hook }** which occupy the **Unit-Energy Space frequency** in order that the **Electron-Hook**, $\ominus$, to be Joint with the **Proton Bracket** $\oplus$.

In order this to happen is needed the Common equation for the *different* [B-O-H], where $w = 2\pi f_1$ and as above frequency cave, $2r = \Delta$, is the amplitude of vibration, where issues

$$T = 2\pi \sqrt{\frac{m}{k}}, \text{ Natural } f_1 = T^{-1} = \frac{1}{2\pi} \sqrt{\frac{k}{m}} = \frac{1}{2\pi} \sqrt{\frac{g}{\Delta}}, \text{ because, } k\Delta = mg, \text{ and } 2r = \Delta = \frac{g}{k} \dots(1)$$

From Orbit-relation $a = \sqrt{\frac{1}{g \cdot f^2}}$, and $f_1 = E/h = 13,6 \text{ eV} / h = \text{Energy-Space-frequency}$

$= 3,28393 \cdot 10^{15} / s$, then the Unit-Energy-Hydro-cave $a = 2,1127839 \cdot 10^{-11} \text{ m} = 2r \dots(1a)$

From Kepler Orbit equations $1 = k \cdot f_n^2 \cdot a^3$, $4\pi^2 f_e^2 \cdot m_e = k = \pi g$, then $m_e = \frac{g}{4\pi f_e^2} \dots(2)$

Because motions of masses, in **Nucleus**, happen under the same Orbit-circumstances then

from (1f₁), (2) $\frac{g}{4\pi^2 \Delta} = \frac{g}{4\pi^2 \cdot m_e}$ and $\Delta = \frac{m_e}{\pi}$, for any mass $m_e = \Delta \cdot \pi$, and $4\pi^2 f_e^2 \cdot m = k \dots(a)$

From Orbit-frequency $f^2 = \frac{1}{4\pi^2} (\frac{k}{m}) = \frac{1}{k a^3}$ is $k^2 = \frac{4\pi^2 m}{a^3}$, and then $k = 2\pi \cdot \sqrt{\frac{m}{a^3}} \dots(b)$

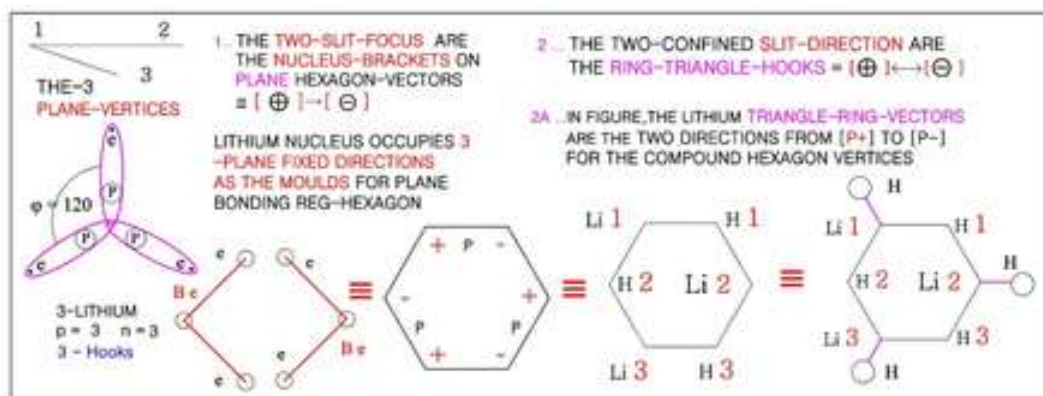


Figure – 39 - : The Three **Lithium -Nucleus-Slits** with angle **120°** -Plane Directions of the Orbit-Hooks can Bond , *on Plane Directions* , in the Steady –Triangle –Shape which is The **Regular-Hexagon-Plane Bonding** . All the Bonding shapes happen in **Plane Polygonal Planar** Geometry from , **Li -H₃^{2D} Plane** .

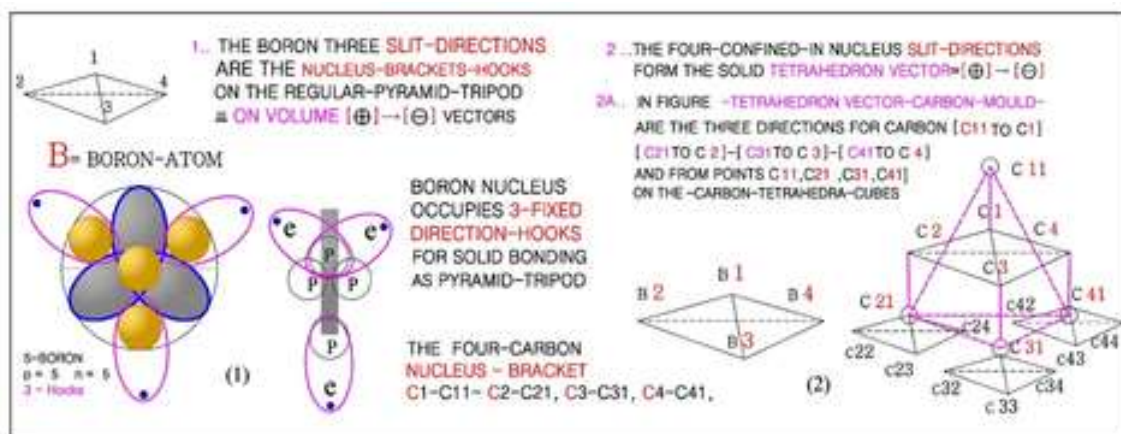


Figure – 40 - : On The **Boron-Atom** with the Three **Nucleus-Fixed-Bracket-Hooks** on a Trigonal Pyramid **Directions** issues the Space of three Planes , **Bo-H₃^{3D} Solid** .
On The **Carbon-Atom** with the Four Nucleus-Fixed-Bracket-Hooks on the **Regular Tetrahedral** $C11-C21-C31-C41$, which is the Strongest-Solid and issues Space of four Planes as , **C-H₄^{4D} Solid** Bond.

Remarks :

- 1.. The **Nucleus Fixed-Brackets-Hooks** occupy the Shape of the Permuted-Positions of the Atom and are the { **Electric-Field-Loops** $\equiv$ EF-Loop } , as Vectors , Lines , Planes , Solids fixed on the Nucleus-Protons .
- 2.. Brackets On **Nucleus-Slit-Positions** are the $\rightarrow$ Fixed-**Proton-Electron-Hooks** .
- 3.. The **Orbit-Hook** is the High-Energy-Vector **Antenna-Electric-Field-Loop** $\equiv$ EF-Loop .

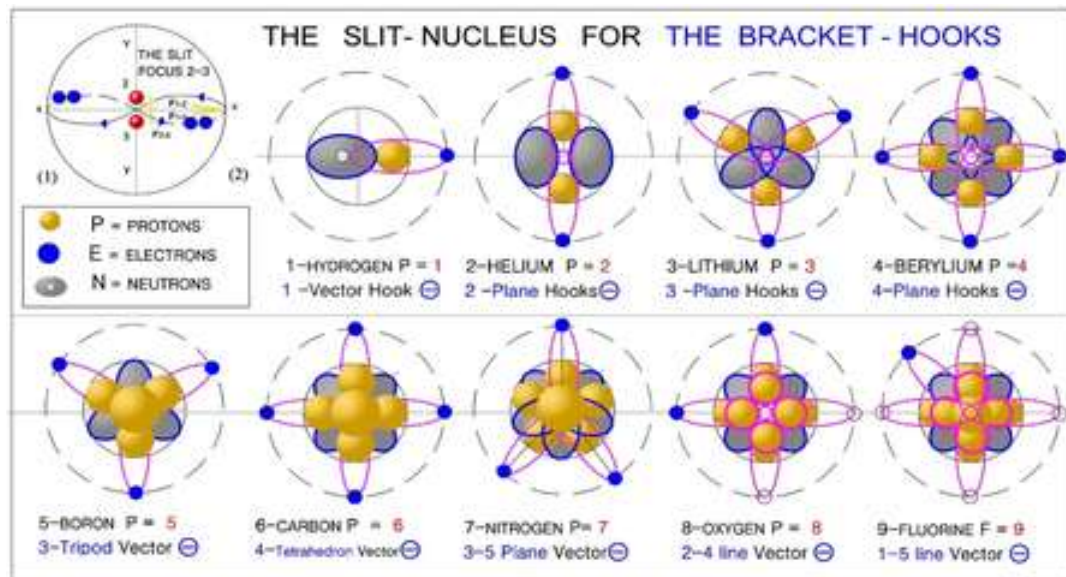


Figure – 41 - : The Two , Points-Problem with Stability of Equilibrium from the Slit-Focus.
In (1) is presented the Three-Points Plane-Problem where the Two Points are very near each other . Planet Passes through the , **SLIT of the Two Focus**.
In (2) Plans is Presented the **Nucleus-Orbit-Hook** ,from Hydrogen through Fluorine to Neon.

The size of Atom-Carbon :

The classical way of measuring depends on Avogadro`s number concerning atomic mass and

$$\text{Carbon-density } C_L = \frac{\text{mass of molas(gm)}}{\text{Density} \left(\frac{\text{gr}}{\text{cm}^3} \right) \text{Avogadro-N}} = \frac{12 \text{ gr}}{2,1(\text{gr/cm}^3)6,02214 \cdot 10^{23}} = 9,454184 \cdot 10^{-24} \text{ cm}^3$$

$$\text{and } C_L = 2,11 \cdot 10^{-8} \text{ cm} = 2,11 \cdot 10^{-10} \text{ m} = 10 \cdot [2,11450164 \cdot 10^{-11} \text{ m}] = 10 \cdot [\text{Hydrogen-cave}]$$

It was Prior found that Bracket-length $B_L = \Delta = 2a = 3,5537772 \cdot 10^{-10} \text{ m}$, so

Above relations $C_L = 10 \cdot H_L = B_L$ allows the Strong Carbon-Hydrogen Bonds .

5-i.. The How Energy Orbits become Nucleus-Hooks :

$$\text{Energy of Photon} = \text{motion} / T \equiv \left(\frac{v}{2\pi r} \right) \cdot [\sigma + \sigma \Phi] = \text{velocity} \rightarrow \bar{v} \cdot \left[\frac{\sigma}{2\pi r} + \frac{\sigma \Phi}{2\pi r} \right] \equiv \bar{v} \cdot \left[\bar{f}_n \right] + \bar{f}_n$$

Both motions , in Orbits and in Nucleus , being in a Potential creates a Total-Magnetic-field

$$\mathbf{M}_T = \mathbf{M}_N + \mathbf{M}_O \quad \dots\dots\dots (1a) \quad \text{which is ,}$$

An Nucleus-Magnetic field M_N and An Orbital , Electron- Magnetic field M_O .

A Vector Quantity has both Magnitude and Direction . The free-Sliding Vectors are Vectors with a line of Application . A line Bisector is called , a Screw , because it becomes from Two Vectors, one from Interior and the other from Exterior Product.

When two Atoms 1 , 2 come in conduct then $M_{T1} + M_{T2} = M_{N1} + M_{O1} + M_{N2} + M_{O2}$,

$$\text{or} \quad M_{T[1-2]} = [M_{N1} + M_{N2}] + [M_{O1} + M_{O2}] \equiv |\bar{R}| \quad \dots\dots\dots (2)$$

Equation (2) is a **Forced-vibration** , a Magnetic-force as **Attraction or Repulsion** , that arises between the Electrically charged particles , *Electrons on Orbits and Nucleus Subatomic particles* , and because excitation is oscillatory , so the System (2) is forced to vibrate at the excitation frequency and when the frequency of excitation coincides with one of the Natural frequencies of the System , **a condition of Resonance is then encountered** , with the Specific frequency f_R , where large oscillations may result . To avoid dangerously **Magnetic-fields-Resonate** , is needed the Non-Linear-System Analysis by using the State-Space approach which studies the motion Presented in the Phase-Plane . Masses are those of Electrons , Protons and Neutrons .

For $M_{T[1-2]} \perp \bar{R}$, then the Projection of Moment M_T on R is equal to zero and in an Orthogonal coordinate-System is $M_1 X + M_2 Y + M_3 Z = 0 \dots (3)$ where , M_1, M_2, M_3 are the Projections of Couple $M_{T[1-2]}$, $R^2 = X^2 + Y^2 + Z^2$, and X, Y, Z , the Projections of $\bar{R}$ lying on the central-axis , $r_{1,2} = [RM_T] / |R|^2$, of Atoms-System P-e . The Total-Energy for Unit-mass is as $\rightarrow E = K_E + P_E = (\frac{1}{2}) \dot{x}^2 + U(x) = \text{constant}$. The Ordinate of the Phase-Plane is given by Planar equation , $\dot{x} = \pm \sqrt{2[E - U(x)]}$

and for Electron velocity $\dot{x} = 0$ then $E = U(x)$ in a closed Orbit ,
i.e. **The Total Energy E is equal to the Potential energy U(x) of Orbit only .**

Since Slits exist between Protons , issues equation , $g f^2 \pi^3 = 1 = g \pi^3 \cdot \left[\frac{B^2}{p}\right]$..(4)

System-Total-Energy $\rightarrow L = \bar{B} \bar{w} = \frac{J \cdot w}{2} = \frac{\pi r^4}{2} [2\pi f]^2 = 2\pi^3 r^4 f^2 = r m v = r m \cdot w r$, and mass

$m = \frac{2\pi^3 r^4 f^2}{r^2 2\pi f} = \frac{\pi^2 r^2}{1} f = \left[\frac{2\pi r}{4}\right] \cdot \bar{v}$, while **Angular-Momentum $\bar{B} = r \cdot m v = r \left[\frac{\pi r v}{2}\right] v = \left[\frac{\pi r^2}{2}\right] \cdot v^2$**
i.e. **The Spin is Related to Cave , r^2 , and Energy v^2 , the light velocity squared ..**

The measuring Process follows , The Total System-mass m_T , Hydrogen-Resonance frequency f_R ,
Common-Energy-Bracket-cave $\Delta = 2a$. Or from Total-Energy-System equation ,

$2L = B w = B 2\pi f = 2\pi \cdot \left[\frac{B^2}{\pi r^4}\right] = \left[\frac{2B^2}{\pi r^4}\right] \equiv h \cdot f_R$, and $f_R = \left[\frac{2B^2 \equiv 2S^2}{h \cdot \pi r^4}\right] \equiv \left[\frac{2S^2}{h \cdot \pi r^4}\right]$ i.e.

The Resonated frequency between Two Atoms is related to their Spin $B \equiv S$

and the created Resonated frequency $f_R \equiv \left[\frac{2S^2}{h \cdot \pi r^4}\right]$ on the Molecules M_{1-2} ,

denoting that **The Constant-conserved-Energy is The , Nutation of Spin only.**

The Data of Bonding $\rightarrow \bar{M}_T = \bar{S}_N + \bar{S}_O$,

a).. **Spin is a Couple of Forces $[+F, -F]$ following the Vectors Rules .**

b).. **Electron [of (-) Charge] moves in Orbit around the Nucleus creating a Magnetic Field tilted to Electron's-Spin $[M_O = S_O]$, therefore it's *tilted axis Precesses* .**

c).. Nucleus-Spin-axis is tilted with Orbit's-Spin-axis ,but because the two free-Couple Vectors $[M_N = S_N$ and $M_O = S_O]$ may be resolved into component vectors and the **Resultant M_T , which is the Diagonal (Magnitude) of the Parallelogram with sides equal to S_N, S_O , Changes** according to their rotation axis with an angle , $d\psi$. At **Nutation-Period , M_O is Swinging** in circular-Magnetic field and angle θ , **Decreases** , so the **Diagonal Spin-Resultant $\bar{M}_T = \bar{S}_N + \bar{S}_O$ Increases** and the Produced Energy is supplied into the nearest Precession-frequency-System which is the classical current-loop of masses , as [The m_N, m_O **Current-loop**] $\equiv$ The **Energy-Proton-Cantilever-Hydrogen-Nucleus-Bracket-Hook -N-O.**

d).. Gravitation-Force through Gravity is continually acting on Orbit-Electron-Spin.

The tilted axis of **Electron-Spin Precesses** by changing the Direction of N-O lever arm

From The Nutation , of Precession in The Magnetic-field due to the Negative ,-,

Charge , And from the tilted axis of Nucleus -Spin which continually Precesses in The Magnetic field . The produced Energy as Resonance frequency f_R is added in

N-O loop or in $\rightarrow$ [The m_N, m_O **Current-Potential-loop $E = U(x)$] as before .**

e).. **In Hydrogen-Atom's cave, The transferred-Energy in Current-loop N-O , is that of Electron-motion with light velocity in the circular-Magnetic-field-lines which are Perpendicular to the Orbit .**

The Direction $x-x$, of the Two Couples of Oscillation is that of the Two masses $m_N, m_O \equiv e$ of **Current-loop which is continually altered because of the Polhode curve . Since the Total Angular Momentum $\bar{M}_T = \bar{S}_N + \bar{S}_O$ where $\bar{M}_T = \bar{L} = I x w$, and is Swinging on the **Precession circle** and **w-Nib on Polhode curve** , then the Resultant $\bar{M}_T$, which is the Diagonal (Magnitude) of the Parallelogram with sides equal to $\bar{M}_N, \bar{M}_O$, **Changes** according to their rotation axis with angle θ .**

At Nutation-Period , $\bar{M}_O$, **is Swinging** and angle θ **Decreases or Increases** , so their

Diagonal-Resultant $\bar{M}_T$ Increases or Decreases and the Energy is transferred in $\rightarrow$ **$[m_N, m_O \text{ Current-Potential-loop } U(x)] \equiv \text{The-Proton-Vector-Bracket }]$, since $K_E = 0$.**

The bound states of Hydrogen have **Negative-Energies** because Proton and Electron can never become infinitely-distance .

Kinetic-Energy K_E , is supplied in the form of a Rotating-Nucleus-Magnetic field IN ORBIT-RIM N-O , which is Applied for a short time in Plane $\perp$ to the variated $\bar{R}$ vector and which is Rotating very near to the Resonance (Precession) frequency of the Nucleus Protons .

$[m_N, m_O \equiv e \text{ Current-loop Increases its } P_E \equiv U(x)]$. Hook PO = The Rim ,

This ORBIT - RIM is $\rightarrow$ The Nucleus-Bracket-Rim-Vector $\leftarrow$ Oriented in Spin axis .

The **Energy-Nucleus-Bracket-Orbit-Rim-Vector** , of **The-One-Proton-Atom** issues and for the multi Proton and Electrons in Orbits and the variated vector $\bar{R}$ as in (F16-3) .

Remark-3 $\rightarrow$ Hydrogen Atom with One Nucleus of Spin $\{+\frac{1}{2}\}$ and one Electron in Energy-Orbit of Spin

$\{-\frac{1}{2}\}$, and is a **Nucleus-Orbit-Magnet** $\equiv \oplus\text{Proton} \leftrightarrow \ominus\text{Electron}$ which **ORIGINATES The-Constant Resonance-frequency** f_R between them, becoming from the Eternal-changeable-motion of the Electron around the Nucleus and from the **Produced Variable – Magnetic - Orbital-Fields**.

Since the **Total-Spin in Hydrogen** is measured and **at the Nucleus-Position** then, **Protons Absorb Energy from The-Electron-Spin** which is moving in its different directions, and **Store it as a Resonance frequency** f_R , IN ORBIT - RIM N-O.

This Orbit-Rim which is [**The**, m_N , m_e , **Current-loop**], continually increase its Energy and so produces a Signal in the Hydrogen-Atom, i.e. **Gravity g, acting On The Varying-Velocity** $\dot{x}$ of the **Orbiting-Electron Creates Work** which is **Conserved** as an **Electron-Magnetic-Field**, or **Magnetic moment**, $\vec{\mu}$, in a time T , and is a **Resonance-frequency** f_R .

When velocity $\dot{x} = 0$ then $E = U(x)$, i.e. the Signal is the Increasing-Potential Energy in loop. **The** [m_N , m_e , **Current-loop**] consists the **Energy-Bond** between Atoms and is the **Communication Tool**, *The Resonance Signal*, in all Universe. In case of **An-External-Magnetic-Field**, **Electron-Spin is swinging around the Magnetic-Vector** and this Motion, *Nutation*, is transferred to the Nucleus.

The Produced-Work as Frequency $f_N = \frac{sQ}{2\pi J_3 w} \equiv f_R = 2,8398447 \cdot 10^{10} \text{ s}^{-1}$

IN MRI, this is the Transverse-Precession, where B-Vector creates an RF Signal from the Precessing Protons, and **Conserved Energy is the frequency** $f_N = f_R$. **Because of the Magnetic-field created On-Orbit and Applied at-Nucleus with the same Effect** then, exists **LARMOR Equation** as $w_0 = \gamma \cdot \beta_0 / 2\pi$, and for Hydrogen at 1,5 T Magnet, $\gamma = 2,675 \cdot 10^8 / \text{sT}$, $\beta_0 = 1,5 \text{ T}$, then frequency $w = 63,864 \text{ MHz} = 63,864 \cdot 10^8 \text{ Hz}$, frequency $f_N = 2\pi \cdot w = 4,012575 \cdot 10^{10} \text{ s}^{-1}$.

Remark - 4 → On Figure – 41 :

BONDING, $f_N = \frac{sQ}{2\pi J_3 w}$, Happens in the **Maximum-Potential cave** $E = -U(x)$, which is needed for any **Two Atoms to Joint** and create **molecules**.

Resonance Phenomena in any Media (Mechanical, Electrical, Acoustic, Magnetic) is that, for Response is the maximum at a Specific-frequency f_R and **requires more Energy Input** including that frequency. Nucleus with Spin $S \neq 0$ can absorb and emit Electromagnetic Radiation and undergo, **Resonance**, when placed in a magnetic field.

This Magnetic-field of Nucleus - Orbit [$p \leftrightarrow e$] already exists in Protons, which Eternally becomes from the Swinging of the **Electron-Angular-velocity-Cone**, with the **Spin-Vector** $\vec{S}$ in the axis of cone as **Angular-Momentum-Vector**, *the Polhode*, at a fixed Point of the **Central-Cone-circle**. Because of Gravity g , **SPIN** $\vec{\psi}$ is under **NUTATION** $\hat{\theta}$, and the **Response** is the **PRECESSION** $\hat{\phi}$, or **THE → GRAVITY-ELECTRON-NUTATION ←** is applied for a short time in the **Plane Perpendicular**, $\perp$, to the **variated Moment-Vector**, $|\vec{R}| \equiv |\vec{M}_T| = |\vec{M}_N| + |\vec{M}_O|$ and the Work produced is **Conserved** in → Nucleus - Orbit [$p \leftrightarrow e$] $\equiv$ **Energy-Box**. **The angular velocity-cone** $\vec{w}$ is **Rolling with Spin-Vector** $\vec{B}$ in the central cone.

6-i.. The Process of Atom – Bonding :

Hydrogen-cave, becomes from the **G Pushing** → on g , on the Earth-Unit-coefficient, k_E , from Relation $G = g \cdot [g_L k_L] \equiv g \cdot [1*1] \equiv \rightarrow g$, or $G = g$, while in all other relative Systems are equal to the proportionality of their Local-constant k_L .

It was proved that, **Constant G, is the mechanism, mould**, for the **First-kick-Start** upon this Unit-Granular-Energy-Stress-Layer g , to formulate in that minimum energy **Orbit** as above → $a = \sqrt[3]{T^2/g} = \sqrt[3]{1/g f^2} = 2,1145016 \cdot 10^{-11} \text{ m}$ (1) in Planck cave.

Electron Charge is created through vibration, f_n , in the **Energy-Space-meters**, g, π , from M-Point,

frequency → $f_N = n \frac{(1+\sqrt{5})\sigma}{4\pi r}$, and → $w = 2\pi \cdot f_N = n \frac{(1+\sqrt{5})\sigma}{2r} = \left| \frac{n}{r} \right| \cdot \frac{(1+\sqrt{5})\sigma}{2}$

The Natural-frequency in Planck's length for the **Primary-Particle** occupying the less

Negative-charge--frequency , is the Electron , and is as Orbit equation with solution,

$$\frac{w_n}{2\pi} = f_e = \frac{1}{2\pi} \sqrt{\frac{k}{m}} = 3,283998.10^{15}/s, \text{ or } 4\pi^2 f_e^2 \cdot m_e = k = \pi g \text{ and } \rightarrow m_e = \frac{g}{4\pi f_e^2}$$

All above Physical Structures Vibrate , In-Vectors with minimum Energy , and are forming the $\rightarrow$ **Electron-charge** $\leftarrow$ **In Surfaces** with minimum Energy **and forming the Orbitals** . Orbit relation $r^3 f_p^2 = \text{Constant}$, as multiplication of cave r , and the frequency $f_N \equiv$ Energy and the **Work** $\rightarrow$ which is motion $\equiv h f_1$ is conserved in orbit r as energy as ,

$$E = \frac{\sigma \Phi \cdot \bar{B}}{2r} = \frac{(1+\sqrt{5})}{2} \frac{\{h\sigma\}}{\{2\pi r\}} = |\bar{\mu}| \cdot \pi r^2 \text{ in } n, \text{ frequencies } \rightarrow f_N = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{n\sigma \cdot \bar{B}}{\pi^3 r^4}$$

and according to Spin $\bar{B}$, or in Nucleus where $\bar{\mu}$ is the **magnetic moment** , i.e.

- 1.. **Hydrogen** is a Three dimensional **Energy-Cave**, with Negative-Potential-Volume.
- 2.. **Electron** is a Negative-Electric-Charge in a ,*Thickness* , two dimensional Energy–Plane -Elliptical-Rim , an **Orbit Ring** , and when Fixed on a Nucleus is **The Hook** .
- 3.. **Atom** is a Material-Point in Hydrogen-Cave , consisted of a Heap from $\oplus$ Particles Jointed with Neutron-Material-Points in the center called Nucleus $\equiv$ Focus , and the Negative-Charged-Particles $\ominus$, moving in the **Energy-Rims** $\equiv$ **E-Ring-Hooks** .
Some Atoms occupy the **Nucleus-Slit-Brackets** in Focus and the **Orbit-Brackets** on Orbits . which consist the **Charged-Moulds** $\rightarrow$ **Electron-Hook** between them.
Nucleus is consisted of Subatomic Particles which are Spinning on their axis .
If Spins are paired against each other then nucleus has NO overall Spin $\equiv$ Total Angular-Momentum ,except that of **Nucleus-COUPLES** with Vector-Sum , R , i.e.
 - a.. If the number of Protons and Neutrons is **Even** , then the nucleus has NO **Spin** , but Because issues $M_T = M_N + M_O$, so only Noble-Gases have No-Spin .
 - b.. If the number of Protons *Plus* the number of Neutrons is **Odd** , then the nucleus has a Half-Integer **Spin** ($1/2$, $3/2$, $5/2$... $n+1/2$)
 - c.. If the number of Protons *Plus* the number of Neutrons is **Even** , then the nucleus has an Integer **Spin** (1 , 2 , 3 , 4 ... n) . [64 - 65]
 - d.. The Projections X,Y,Z of Couple $M_{T[1-2]}$ on $\bar{R} \equiv \sqrt{X^2 + Y^2 + Z^2}$,central axis , creates the Two Opposite Spins S , perpendicular each other and $[M_{T[1-2]}]x[\bar{R}] = 0$.

From above ,the only Energy in Nucleus is **the Spin** $\equiv$ **Momentum** and for Equilibrium is Split in two Orientations ($+1/2$, $-1/2$) , and in Atom is the Spin Quantum number $m=1/2$ and $m=-1/2$. **In case of Zero Spin** , and a Magnetic field applied , **then the two Projections of Nucleus-Spin S , on axis , z , (+ R/2 , - R/2) follow Field-lines** .The **Spin of the Nucleus** , is the Nutation of Electron-Precession as

$$M_T = M_N + \frac{sQ}{2\pi J_3 w}$$

The Difference of these Spin-Projections is the Reason for any Two Atoms to Joint.

One way is the Sticking of any Two Atoms with the , **Electrostatic-Forces** , from opposite-Charges which are Attractive and this because $\pm$ **IONS** $\equiv$ **CHARGES** .

A **Second way is the Joint** of Two Atoms with an **Electric Field-Loop** $\equiv$ **Mould** which is **Charged** , and Supported on Atoms with , **Brackets** , if such exist . **Such Brackets** exist on **Nucleus as** $\rightarrow$ **The-Slit-Proton-Brackets** $\leftarrow$ and on **Orbits** $\rightarrow$ **The Orbit-Rim-Hook** $\equiv \pm$ **IONS** $\leftarrow$ all used for the **Electron-Orbit-Hook** Joints.

From analysis is seen that Atoms occupy the maximum Energy , at the closest approach r_p , where at Focus is the maximum Potential-Energy , i.e. Orbits with min r_p are the Strongest **Ring-Moulds** . In Atoms ,Both-Brackets for Bonding ,**Electron-Orbit-Hooks** and the **Protons Slit Nucleus-Brackets** must be the Strongest Differently Bond is impossible or brakes.

Slit-Nucleus-Brackets are $\rightarrow$ **The-One-Vector-Bracket** , **The-One-Linear-Bracket** , **The-Two Plane - Brackets** , **The-Three-Solid-Brackets** , and **The-Three -Volume –Brackets** , all of them following the Material-Geometry-Rules.

- a.. The-Two-Linear-Brackets $\rightarrow$ occur on **Helium** forming $\pm$ Vector-Bond $\leftarrow$ He $\rightarrow$
- b. The-Two-Plane -Brackets $\rightarrow$ occur on **Lithium** forming , Plane Regular-Hexagon
- c.. The-Three-Volume-Brackets $\rightarrow$ occur on **Boron** forming , the Solid Regular Tripod **Carbon** forming the Tetrahedron as the first 3-DIM-Mould ,which is the Base of **Organic-Chemistry CH4** . The **Fluorine Strongest-Vector-Bracket** is referred in 7i.

Question ?? **What is that giving to Atoms Strength for Molecules-Boding** .

Bonding to take place needs the $\oplus$ **Brackets** on Nucleus and the $\ominus$ **E-Orbit-Rings $\equiv$ Hooks**.

Brackets, do Not exist in all Atoms but the only different bonding is that of Ionic-Bond .Material-Geometry Proposes the , **Slit-Focus** , so that Bonding to issue for all Atoms From equation $E = h.f_N = 6.62607.10^{-34}$.

$$2,8398447.10^{10} = 18,817009. 10^{-24} \text{ J} / (1,6. 10^{-19}) = \mathbf{1, 1760625.10^{-4} \text{ eV}} \dots\dots(1)$$

i.e. The Potential-Energy Produced Due Nutation may be added to any Energy-level.

From Hydrogen Energy Levels Energy $E = \frac{-13,6 \text{ eV}}{n^2}$, and for $n=1$ then $E = -13,6 \text{ eV}$

The Total Energy in Orbit $= 1,1760625.10^{-4} - 13,6 = -13,599824 \text{ eV}$, and Mould is

The Bracket $\rightarrow \{ \text{NUCLEUS} + \text{ORBIT-VECTOR} + \text{ELECTRON} \} \equiv E = h.f_N \dots(2)$

The **Proton's-Brackets** are FIXED on (A) Atom **NUCLEUS** as $\rightarrow$ **Proton-Slit-Focus** $\leftarrow$ and on **NUCLEUS** of Atom (B) as $\rightarrow \ominus \rightarrow \oplus$ **Electron-Proton** of Atom (B) , OR on **Orbits** of Atom (B) as $\rightarrow$ **Orbit-Electron-Ring-Joint** $\leftarrow$ Covalent-Bonding .

The Nutation-Electron at the End of Orbit-Vector is to-be Attract by the , $\oplus$,Nucleus.

- 1.. Since Electrons do not stay in Excited-States over the **Ground-one** , so they soon return to their Ground-States , by **Emitting** a Photon with the same Energy as the one that was absorbed .

In the case of Ground-States as in Hydrogen Atom where exists only One Ground-State by **Absorbing** a Photon , the **Electron** is getting Energy and is **Launched Out the Orbit** , *is given off* , and becomes a moving **Travelling -Electric-field-Loop** as this is in Antennas [EF-Loop] .

In case of Brackets $\equiv E = h.f_N$, Electron by getting Potential-Energy in loop $U_1 + U_N$, gets more Strength and tends to Joint with the other Nucleus-Protons .

An Atom is of Neutral-Charge when has the same number of Protons and Electrons .If an Atom loses or gains Electrons it becomes Ionized or Charged , and in case of the Hydrogen ,**Ion** or a **Charged-Electric-field Loop** [EF-Loop] is of maximum Potential Energy .This **Charged-Electric-field-Loop** is that what we call **Hydrogen-Bracket** .So , **Hydrogen-Mould** , is the $\rightarrow$ **Charged-Electric field Loop of Hydrogen** $\leftarrow$ i.e.

An **Electron-Orbit** with the **max-Negative Potential-Energy** becoming from the **Absorbing of a Photon** at least , and which **has** at Focuses $\equiv$ Nucleus One **Proton** and an **Electron** , is a FIXED-HORN-Ring Loop as Monopole-Antenna ,Therefore ,

Gravity , Photon , is That giving to Atoms Strength for the Molecules Boding .

- 2.. Since Orbits are Plane-Energy-Rims , *Rings* , which pass through the Slit-Nucleus , occupy very **High Energies** and accordingly can pass through them independently .
- 3.. Since Slits are very-Narrow-Holes Electron passing through them occupy **Direction**

Therefore , Vector-Direction , Line-Direction ,Plane-Directions ,Volume-Directions is occupied through the One-Two-Three-Slit-Nucleus ,which correspond to Shapes of Material-Geometry as the , **Vectors** ,where Two Perpendicular **Vectors are for Lines** ,The Regular **Triangle for Plane** ,The Regular **Tetrahedron for Solids** .

- 4.. Atoms with **Slit-Focus** are , **Hydrogen , Helium , Lithium , Beryllium , Boron , Carbon Nitrogen , Fluorine** , therefore when they are Charged with Electric field Loop *can offer The* , **Vector , Linear , Plane , Volume Bonding between the Atoms** .

- 5.. The Slits are Nearly line vectors , Electrons execute reciprocating motion according to equation $\ddot{x} + w^2 x = 0$, with solution $4\pi f^2_e \cdot m_e = g$, $w = 2\pi f$, from which occupy the **Direction** of $v = 2\pi d.f \rightarrow$ which is the direction of the Slit-Proton **d** .

- 6.. Since Slits are **Line-Vectors** and determine the **Direction of Bonding** therefore ,
 - a.. The **Three** Slits , on Protons , Produce always **Volume-Bond-Structures-Moulds** ,
 - b.. The **Two** Slits , on Protons , Produce always the **Plane-Bond-Structures-Moulds** ,
 - c.. The **Two** Slit , on Protons , Produce always the **Line-Bond-Structures-Moulds** .
 - d.. The **One** Slit , on Proton , Produces always the **Vector-Bond-Structure-Mould** ,
OR The Material-Point Joint- System , OR the Nucleus-Bracket-Hook-System .

The Number of Protons , **p**, Neutrons , **n** , in Nucleus denotes The number of Electrons , **e** , in Orbit-Rims which Orbit is filled as the relation , $e = 2.N^2$, where $N = 1,2,3..n$ as below ,

Atom , Orbit-e-Positions , Free-Positions , Occupied-Positions $\equiv$ N-Brackets , O-Hooks					
↓	↓	↓	↓	↓	↓
1.. H = Hydrogen	2 e	1 e	1 p=Proton	1	$\leftrightarrow$ 1 , 2
2.. He= Helium .	2 e	0	2 p	2	$\leftrightarrow$ 2 , 2
3.. Li = Lithium.	8 e	7 e	3 p	3	$\leftrightarrow$ 3 , 7
4.. Be = Beryllium	8 e	6 e	4 p	4 Plane.	$\leftrightarrow$ 4 , 6
5.. B = Boron	8 e	5 e	5 p	3 Volume	$\leftrightarrow$ 3 , 5
6.. C = Carbon.	8 e	4 e	6 p	4 Volume.	$\leftrightarrow$ 4 , 6
7.. N = Nitrogen.	8 e	3 e	7 p	3-5 Plane.	$\leftrightarrow$ 3 , 5
8.. O = Oxygen.	8 e	2 e	8 p	2-4 Line.	$\leftrightarrow$ 2 , 6
9.. F = Fluorine.	8 e	1 e	9 p	1-5 Line.	$\leftrightarrow$ 1 , 6
10..Ne = Neon	8 e	0 e	10 p	2	$\leftrightarrow$ 2 , 0
11..Na = Sodium	11 e	7 e	11 p	1 .	$\leftrightarrow$ 1 , 1
12..Ma = Magnesium	12 e	6 e	12 p	1 .	$\leftrightarrow$ 1 , 2
13.. Al = Aluminum	13 e	5 e	13 p	1	$\leftrightarrow$ 1 , 3
14..Si = Silicon.	14 e	4 e	14 p	1	$\leftrightarrow$ 1 , 4
15..P = Phosphorus.	15 e	3 e	15 p	1	$\leftrightarrow$ 1 , 3
16..S = Sulfur	16 e	2 e	16 p	1	$\leftrightarrow$ 1 , 2
17..Cl = Chlorine.	17 e	1 e	17 p	1	$\leftrightarrow$ 1 , 1
18..A = Argon	18 e	0 e	18 p	2	$\leftrightarrow$ 2 , 0
19..K = Potassium.	19 e	17 e	19 p	1	$\leftrightarrow$ 1 , 1
20..Ca = Calcium.	20 e	16 e	20 p	2	$\leftrightarrow$ 2 , 2
21..Sc = Scandium.	21 e	15 e	21 p	1	$\leftrightarrow$ 1 , 3

On the **Occupied-Positions** , **The Nucleus - Protons** , are Joint the Energy-Brackets as this is { **Electric-Field-Loops** $\equiv$ EF-Loop } $\leftrightarrow$ Brackets $\equiv$ **Proton – Electron - Hook** , Brackets on the **Nucleus** are 1).. Nucleus $\rightarrow$ **Nucleus – Electron-Proton - [EF-Hook]**
 2).. Nucleus $\rightarrow$ **Proton – Electron – Proton [EF-Loop]**
 Brackets on Orbits are the 3).. Orbit $\rightarrow$ **Electron – Electron – [EF-Loop]**

Bonding occurs between the **Nucleus - Slits** as **Brackets** and the **Electron - Orbits** as the **Hooks** , the < **Bracket – Orbit - Hook** > . Brackets - **Direction** , becomes from Nucleus Atoms Possible Slits , **and the Shape**, from the Energy into the Two Atoms which Joint to create Molecules .

By increasing the Orbit - Energy **at-One-Photon** or the Negative – Potential - Energy of the Vector of the < **Bracket-Orbit-Hook** > **then becomes Positive** , and Electron-Hook attracts the other Atom's-Nucleus of lower Voltage and Bond . This Hydrogen-Linear-Orbit [$\oplus \rightarrow \ominus$] of High Energy-Vector is the **Orbit-Charge-Hook** .

It was Prior Shown that , Conductor $\overrightarrow{AK_A} = \mathbf{Q}_{\pm} = \left| \frac{c\vec{S}}{r^2} \right| = I_E =$ The-Electric-Wave-Intensity **And** , $\overrightarrow{A \uparrow K_A} \equiv I_M$

The-Magnetic-Wave-Intensity and **Vectors-Square** = $[\overrightarrow{AK_A}] \times [\overrightarrow{A \uparrow K_A}] = [\mathbf{Q}_x \mathbf{Q}_{y+x}] =$ The-Energy-Square

= $\mathbf{CM} \times \mathbf{CM} = \mathbf{CMNH}$ on circle (E , EA) . From the Equal-Stress $\sigma = \frac{F}{A} = \frac{v}{\Phi} = \frac{F_A}{CB.CB} = \frac{F_N}{CM.CM} = \frac{F_N}{CM^2} = \frac{F_{A'}}{\pi.C.CN^2}$

between the Points B and A , as in F-51 , issues that , **The Resultant-Length-CA** , continually Transports $\rightarrow$ 1)..{Area $\equiv \mathbf{CB} \times \mathbf{CO} \equiv \mathbf{CBAO} \equiv$ **Square** $\equiv$ **Force / Stress** } of the Circumscribed-circle , $\pi.EA^2$, to the **Resultant-Length - CN** , 2).. Continually Transports { **New Area** $\equiv \mathbf{CM} \times \mathbf{CH} \equiv \mathbf{CMNH} \equiv$ **Square** $\equiv$ **Force / Stress** } of the **Circumscribed-circle** $\pi.EA^2 = \mathbf{CM} \times \mathbf{CN}$, To the equal Circumscribed circle , $2\pi.EB^2$, **And** , To The **Resultant-Length – CA'** , 3)..Continually Transports { **Area** $\equiv \mathbf{CA} \times \mathbf{CP} \equiv \mathbf{CAA'P} \equiv$ **Square** $\equiv$ **Force / U-Stress** } , Through the **Wavy- Rotating - Circle** (O,OB_e) $\equiv$ (O,OA_e) $\equiv$ (O,OA''_e) , where PA' = A'A'' , beginning from radius , OB_e = OA_e = OA''_e , and **carry The nib** of The – Resultant -Vectors [CA , CN , CA'] Through **Pole P** , lever-arm Vectors , PA $\cup$ PN $\cup$ PA' .

The Square , **NCHM** $\equiv$ **CMNH** , is of Side CM and **Equal to the Initial Circumscribed** , to CBAO

Square and **circle** $\rightarrow \pi.\left[\frac{CA}{2}\right]^2 \equiv \pi.EA^2 \equiv \pi.EB^2 \equiv \pi.EC^2$. **i.e.** Anti Quadrature of Energy-Squares is ,

Anti-Quadrature $\equiv$ **The Pushing of Energy-Area** $\rightarrow$ { **Area [Force / Stress] of Each-Individual-Square** $\equiv$ **EM-Wave Vector** } $\leftarrow$ **Into Its-Circumscribed-Circle** . Implies also That The Area on Energy-Circle

is $\pi.\left[\frac{CA}{2}\right]^2$ of Square CBAO , and is carried to Square CMNH .

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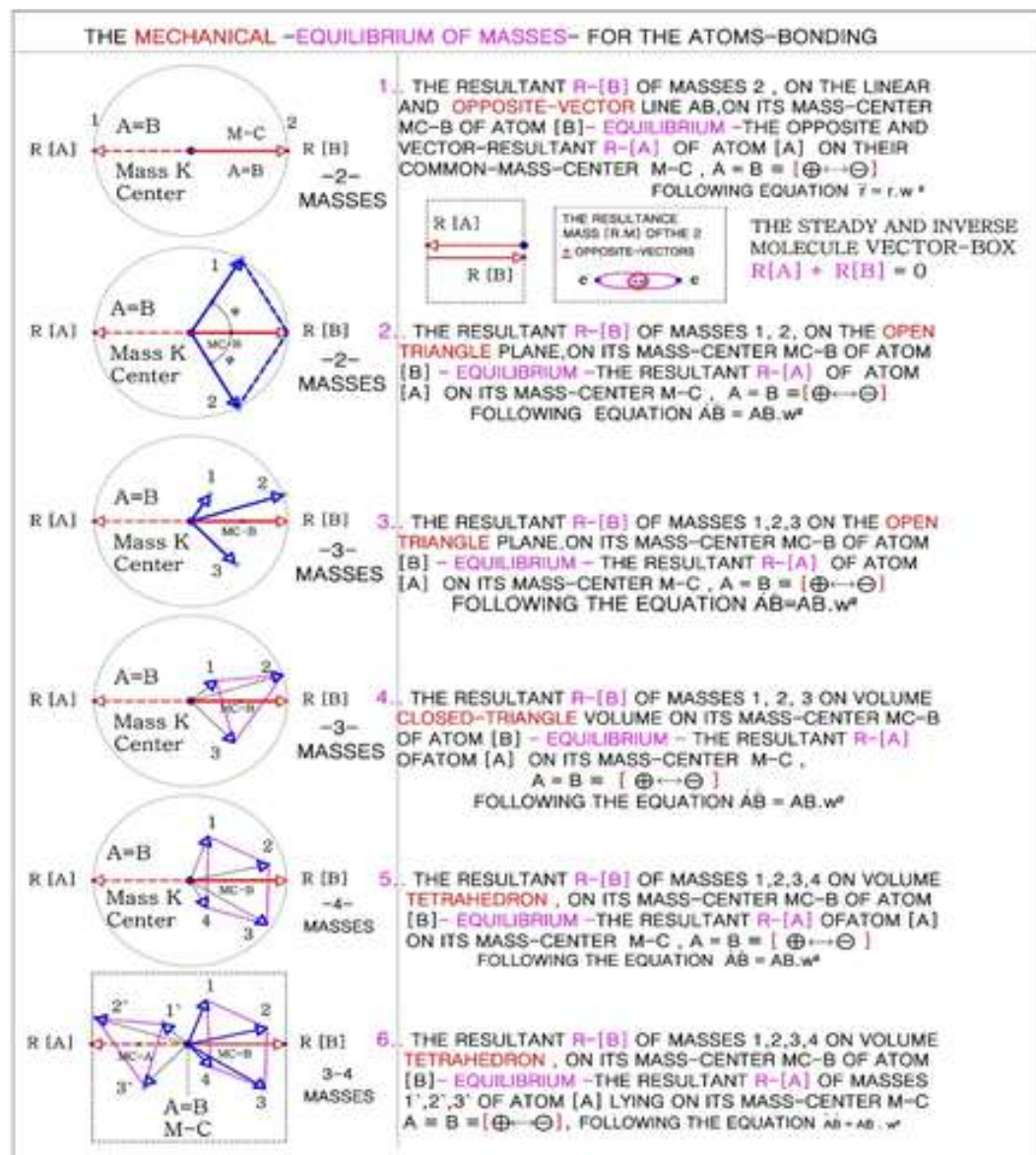


Figure – 42 - : The Vector , Linear , Plane , Volume , Elements-Types , of Bonding .

In (1) is shown the Stability of the Opposite-Vectors $\vec{A} \leftarrow K \rightarrow \vec{B}$ at K, which is the center of mass of equilibrium in Molecule [A-B].

In (2)-(6) is shown Vector, KA. It is the Resultant of masses on Atom [A] and it is equal and Opposite to Vector, KB, which is the Resultant of masses on Atom [B] on where issues $\vec{KA} + \vec{KB} = 0 \equiv$ The Lagrange's Stationary Molecule [A-B].

The-Energy-Bracket as Proton-Electron-Orbit-Vector joint {where $E = h \cdot f_N = 1,1760625 \cdot 10^{-4} \text{ eV}$ } is the AB axis, where lie Centers of masses, on-where Equilibrium the **Rigid-Body-Vectors of Rotation and Translation** for their Resultant masses {R-M} $R[A]$, $R[B]$, where issues $\{R-M\} = \sum_1^n m_i$ so, In A-B axis issues the Stability of the Two Opposite Vectors from Symmetry and Equality.

From Material-Geometry-Rules where $P \equiv$ The Charge-Positions, $D \equiv$ The Dimensions,

a.. The-One-Linear-Bracket $\rightarrow$ occur on **Hydrogen** forming + Vector-Bond $[K \rightarrow B]$

$\text{He-H} \xrightarrow[2\text{Linear} \pm \text{Vector} - 2\text{Position}]{1\text{Direction} - \infty \text{Vectors}} \equiv \text{He-H} \xrightarrow[2\text{LP}]{1\text{D} - \infty \text{Vectors}} \equiv \text{H} \xrightarrow[1\text{N-LP}]{1\text{D} - \infty \text{Vectors}}$

b.. The-Two-Linear-Brackets $\rightarrow$ occur on **Helium** forming $\pm$ Vector-Bond $\leftarrow \text{He} \rightarrow$

$[1 \leftarrow K] - [K \rightarrow 2] \equiv \text{He-H} \xrightarrow[2\text{LP} \rightarrow \phi \text{Line}]{1\text{D} - 2\text{Line} \pm \text{Vectors}} \equiv \text{He} \xrightarrow[2\text{N-LP}]{1\text{D} - \infty \text{Vectors}}$

c. The-Three-Plane -Brackets $\rightarrow$ occur on **Lithium** forming, Plane Regular-Triangle.

- $[K \rightarrow 1]-[K \rightarrow 2]-[K \rightarrow 3] \equiv \text{Li-H} \begin{smallmatrix} 2D-\text{Triangle} \\ 3PP=\text{Plane} \end{smallmatrix} \equiv \text{Li} |X \begin{smallmatrix} 2D-\text{Tri} \\ 2N-PP \end{smallmatrix} |$,
 d. The-Four-Plane -Brackets $\rightarrow$ occur on **Beryllium** forming , Plane Regular-Orthogonal
 $[K \rightarrow 1]-[K \rightarrow 2]-[K \rightarrow 3]-[K \rightarrow 4] \equiv \text{Be-H} \begin{smallmatrix} 2D-4\text{Sited} \\ 4PP=\phi\text{Plane} \end{smallmatrix} \equiv \text{Be} |X \begin{smallmatrix} 2D-4\text{Si} \\ 4N-PP \end{smallmatrix} |$,
 e.. The-Three-Volume-Brackets $\rightarrow$ occur on **Boron** forming , the Solid Regular Tripod
 $[K \rightarrow 1]-[K \rightarrow 2]-[K \rightarrow 3] \equiv \text{Bo-H} \begin{smallmatrix} 3D-\text{Tripod-Pyramid} \\ 3VP=\text{Solid Positions} \end{smallmatrix} \equiv \text{Bo} |X \begin{smallmatrix} 3D-3\text{Pyr} \\ 3N-VP \end{smallmatrix} |$,
 f.. Four-Volume-Bracket-Hooks $\rightarrow$ occur on **Carbon** forming the Solid-Regular-Tetrahedron
 $[K \rightarrow 1]-[K \rightarrow 2]-[K \rightarrow 3]-[K \rightarrow 4] \equiv \text{C-H} \begin{smallmatrix} 3D-4\text{Points Regular-Tetrahedron} \\ 4VP \rightarrow \phi=60-\text{Solid Point Positions} \end{smallmatrix} \equiv \text{C} |X \begin{smallmatrix} 3D-\text{Teh} \\ 4N-VP \end{smallmatrix} |$,
 as the first 3-DIM-Mould on {R-T} , which is the Base of **Organic-Chemistry C₁ H₄** .
 g.. Three-Volume-Bracket-Hooks $\rightarrow$ occur on **Nitrogen** forming , the Solid-Regular-Triangle
 $[K \rightarrow 1]-[K \rightarrow 2]-[K \rightarrow 3] \equiv \text{N-H} \begin{smallmatrix} 2D-\text{Triangle} \\ 6P=\phi\text{Plane} \end{smallmatrix} \equiv \text{N} |X \begin{smallmatrix} 2D-\text{Hex} \\ 6N-PP \end{smallmatrix} |$
 h.. Two-Plane-Bracket-Hooks $\rightarrow$ occur on **Oxygen** forming , Two-Perpendicular $\perp$ Vectors
 $[K \rightarrow 1-1]-[K \rightarrow 2-2] \equiv \text{O-H} \begin{smallmatrix} 2D-2\perp\text{Plane Vectors} \\ 2P \rightarrow \phi=90 \rightarrow \text{Plane} \end{smallmatrix} \equiv \text{O} |X \begin{smallmatrix} 2D \rightarrow 1V \\ 2N-PP \end{smallmatrix} |$, or the Solid Regular-Tripod .
 i.. One-Line-Bracket-Hook $\rightarrow$ occurs on **Fluorine** forming , The One-Direction-Vector
 $[K \rightarrow 1] \equiv \text{F-H} \begin{smallmatrix} 1D-\text{Line Vector} \\ 1P \rightarrow \phi \text{ Line} \end{smallmatrix} \equiv \text{F} |X \begin{smallmatrix} 1D \rightarrow V \\ 1N-LP \end{smallmatrix} |$
 j.. Two-Line-Brackets-Hooks $\rightarrow$ occur on **Neon** forming , The two Opposite $\pm$ Line-Vectors ,
 $[1 \rightarrow K]-[K \rightarrow 2] \equiv \text{Ne-H} \begin{smallmatrix} 1D-2\pm\text{Line Vectors} \\ 2P \rightarrow \phi=180 \rightarrow \text{Line} \end{smallmatrix} \equiv \text{Ne} |X \begin{smallmatrix} 1D \leftarrow 8 \rightarrow V \\ 1N-LP \end{smallmatrix} |$
 n.. The-**n_{th}** Space-Brackets $\rightarrow$ occur on **Atom** forming , the Complex-Shape as Prior-Board
 Comparing , Lewis-Symbols for the Share-Pairs of Electrons and Atoms for Hydrogen are as
 Bondings, **H** $| \begin{smallmatrix} 1D \rightarrow V \\ 1-LP \end{smallmatrix} |$, **He** $| \begin{smallmatrix} 1D \pm \leftarrow \\ 2-LP \end{smallmatrix} |$, **Li** $| \begin{smallmatrix} 2D-\text{Tri} \\ 2-PP \end{smallmatrix} |$, **Be** $| \begin{smallmatrix} 2D-4\text{Si} \\ 4-PP \end{smallmatrix} |$, **Bo** $| \begin{smallmatrix} 3D-3\text{Pyr} \\ 3-VP \end{smallmatrix} |$, **C** $| \begin{smallmatrix} 3D-\text{Teh} \\ 4-VP \end{smallmatrix} |$,
N $| \begin{smallmatrix} 2D-\text{Hex} \\ 6-PP \end{smallmatrix} |$, **O** $| \begin{smallmatrix} 2D \rightarrow 1V \\ 2-PP \end{smallmatrix} |$, **F** $| \begin{smallmatrix} 1D \rightarrow V \\ 1-LP \end{smallmatrix} |$, **Ne** $| \begin{smallmatrix} 1D \rightarrow V \\ 1-LP \end{smallmatrix} |$, **Na** $| \begin{smallmatrix} 2D-\text{El} \\ 1-PP \end{smallmatrix} |$, **Ma** $| \begin{smallmatrix} 2D-\text{El} \\ 1-PP \end{smallmatrix} |$, i.e.

After The-3D-Solid , **X** , Atom follows $\{ \begin{smallmatrix} \infty, 1, 2, 3-\text{Dim-Shape} \\ n, \text{Space-Positions} \end{smallmatrix} \text{X} \text{ or } \text{X} \begin{smallmatrix} 1, 2, 3-\text{Dim-o} \\ n, \text{Plane+Posit} \end{smallmatrix} \}$ Bonding
Explanation : **Symbol of Carbon C** is $\rightarrow \text{C} | \begin{smallmatrix} 3D-\text{Teh} \\ n=4N-VP \end{smallmatrix} | \equiv \text{C} | \begin{smallmatrix} 3 \text{ Dimension-Hooks on Tetrahedron} \\ 4 \text{ Brackets-Volume Position} \end{smallmatrix} |$,
 Where , **4N - Brackets** is the number of the - **Nucleus** $\rightarrow$ **Proton-Electron-[EF-Loop]**
 while **4O-Brackets** is the - **Orbit** $\rightarrow$ **Ring-Electron-[EF-Loop]** , **VP** = Volume Positions ,
3D = The three Dimensions x , y , z , **Teh** = The Rigid Tetrahedron of the 4 Charge-vertices . Hooks are
 the Charge-vertices those which create the Bonding between all Particles . **The Spin S** , as Space + Energy in
 caves $\rightarrow \bar{S} \equiv \frac{\bar{c}.r}{g} \bar{q}$, creates the Two-Types of Charges $\pm \bar{q}$, which are the Sources of Electromagnetism and
 from Charges $\pm \bar{q}$, the Coulomb-forces **F** , which Forces Joint the Charges through the Waves as
Constructive $[\oplus \rightarrow (+) \leftarrow \oplus]$ or $[\ominus \rightarrow (+) \leftarrow \ominus]$, and to the **Destructive** $[\oplus \rightarrow (-) \rightarrow \oplus]$ **Interference** .

The Procedure of Energy Transportation :

In Fig-33, Conductor $\overrightarrow{AK_A} = \mathbf{Q}_{\pm} = |\frac{c\bar{S}}{r^2}|$ = Electric-Wave-Intensity and $\overrightarrow{A \uparrow K_A} \equiv$ Magnetic-Wave-Intensity and
 $\rightarrow [\overrightarrow{AK_A}]x[\overrightarrow{A \uparrow K_A}] = [\mathbf{Q}_x \mathbf{Q}_y] = \text{Energy-Square} = \text{CM} \times \text{CM} = \text{CMNH} \leftarrow$ Using **The-Stress-Relation** $\leftarrow$
 $\sigma = \frac{F}{A} = \frac{2\pi r f}{\phi} = \frac{w r}{\phi} = \frac{v}{\phi} = \frac{F}{CB.CB} = \frac{F}{CM.CM} = \frac{F}{CM^2} = \frac{F}{\pi.CCM^2}$, on circle (E ,EA) and between Points B and A , then F-51
The Length-CM , continually Transports Area $\equiv \text{CMNH} \equiv \text{Square} \equiv \text{Stress}$ of the **Inscribed circle, $\pi.EG^2$** ,
 To the **Circumscribed circle, $\pi.EB^2$** , through the **Wavy – Expanding-Circles** , (O,OB) - (O,OB_E) - (O,OZ) ,
 beginning from radius , OB_E , to OZ , and through **Pole P** , from Vectors PA to PA_E . The Square NCHM $\equiv$
 CMNH , is of Side CM and equal to Its-Inscribed-circle , $\pi. [\frac{CM}{2}]^2 \equiv \pi.EA^2 \equiv \pi.EB^2 \equiv \pi.EC^2$, **This in Geometry** .

In Physics , Anti-Quadrature , Is The Conversion of The-Moving-Energy-[Square Prism $|Q_x.Q_y|.|AK_A|$

$\equiv |\bar{E}_E \leftrightarrow |x|\bar{E}_M = \uparrow |x|d| \rightarrow$ **To An-Movable -Equal Energy -Sphere Cone** $\equiv \mathbb{C} k.\pi.r^3 \leftarrow$ i.e.
 At Position K_A , Due to Current- Phase-shift , $\phi = \pm 180^\circ$ issues an Energy Quantity $Q_x = \mathbf{Q} \rightleftharpoons \overrightarrow{AK_A} = |\leftrightarrow|$
 following Charges rules , and because of Phase is Transformed to an Transverse motion $Q_y = \mathbf{Q} \uparrow \uparrow \overrightarrow{AK_A} = |\uparrow \uparrow|$.
The Electric – Current $= \frac{\text{Charge}}{\text{Time}} = i = \frac{\bar{q}}{T}$ is Produced from Electromotive-Force $\bar{F}_E = \frac{[\oplus \rightarrow \ominus]}{r^2} = \overrightarrow{AK_A}] = V$
 $= \frac{\bar{E}}{q}$ at time T , and in the same Way , in T=1 sec , Energy $\equiv$ motion $\equiv E = \bar{q}.V$ is conserved in , $\overrightarrow{AK_A} = d$
 Conductor as **The Quantum-Power-Force** $\mathbf{Q}_{\overrightarrow{AK_A}} = \mathbf{Q}_+ = |\frac{c\bar{S}}{r^2}| = Z_{AK_A} \frac{d}{r} = |\bar{e}| \times \frac{3}{3} = \mathbf{I}_E \equiv$ Electrical Intension.

Euclidean's Geometry Quantized Spaces		Euclidean Geometry	Material Geometry	Material Dimensions	Permitted Units $\oplus \ominus$	MOULDS Permitted Positions	S L U The Full Orbital Units
1		2		3		4	
1	Point			The ONE First Dimension Point - Space	2	2 P^2	The Inner-Atoms Onion - Structure
2	Line Segment			The ONE First Dimension Line - Space	4	1	
3	Plane Reg.3gon			The TWO First Dimension Plane - Space	6	2	
4	Volume Reg.4gon			The THREE First Dimension Volume - Space	8	8	
5	Space Reg.5gon			The FOUR First Dimension Volume - Space	10	18	
6	Space Reg.6gon			The FIVE First Dimension Volume - Space	12	32	
7	Space Reg.7gon			The SIX First Dimension Volume - Space	14	50	
8	Space Reg.8gon			The SEVEN First Dimension Volume - Space	16	72	
9	Space Reg.9gon			The EIGHT First Dimension Volume - Space	18	98	
10	Space Reg.10gon			The NINE First Dimension Volume - Space	20	128	P = Number of Positives = N-2 and N = Spaces = The Number of Points
N	Space Reg.Ngon			The N - 1 First Dimension Volume - Space	2 N	2 N^2	

Figure – 43- : Euclidean and Material-Geometry-Elements .The Atoms Structure is that of Onion under-Plane-conditions .The three Elements Generate , Microcosm and Macrocosm.

The **Three Elements** $\equiv$ Digits of Material-Geometry are Charges $\{ \oplus, [\oplus \leftrightarrow \ominus], \ominus \} \equiv [+, 0, -]$
The Positive , The Zero , The Negative with their Global meaning .

The Heap of Masses $\mathbf{m} = M_T$ follow Newton laws , The Charges $[\oplus, \pm \bar{q}_p, \ominus]$ follow the Coulomb law, the Zero-Electron Charges $[\oplus \leftrightarrow \ominus] \equiv \pm \mathbf{0}$, the Material-Geometry Rules of the Arrangements , **The Positions n** , the Material-Geometry Rules of Combinations and Permutations .

Charges $[\oplus, \pm \bar{q}_p, \ominus]$ Interact as **One-Harmonic-mass-Resistor-System** and create The Elementary **Electric Forces** which in turn the Bonding of Cosmic-Particles from their Constructive and Destructive Interference
Markos 24 /12 /2020 .

7-i.. The Atoms - Bonding in Board - Mechanism :

1..The Helium Bonding : $\mathbf{He} |_{2N-LP}^{1D \leftrightarrow \pm} \equiv \mathbf{He} |_2^{1D} | \leftrightarrow$ with Hydrogen and others is figuard as ,

$\mathbf{He} |_2^{1D} | \leftrightarrow \mathbf{H}_1^0 \equiv \mathbf{H}_e[X_2^1]$, where at Nucleus-Bracket - Hook Index **2** , can be Placed Any Two Elements of table Occupying , 1 or 2 , Charge - Positions

Under the Unit-Energy-Cave-Obligation $f_1 = \frac{1}{2\pi} \sqrt{\frac{g}{2r^3}}$, exists ,

The Possible - Bonding under the Unit-Energy restraint is ,

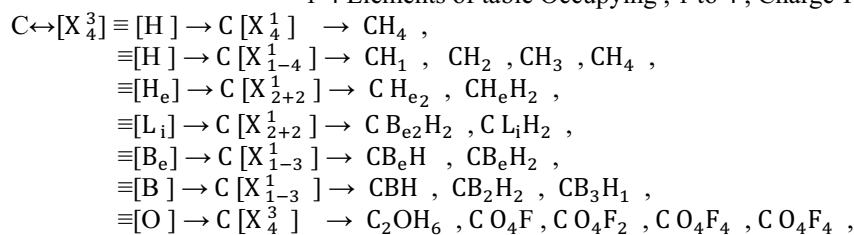
$\mathbf{H}_e \leftrightarrow [X_2^1] \equiv \mathbf{H}_e\mathbf{H}_e , \mathbf{H}_e\mathbf{H} , \mathbf{H}_e\mathbf{Li} , \mathbf{H}_e\mathbf{Be} , \mathbf{H}_e\mathbf{B} , \mathbf{H}_e\mathbf{F}_2 , \mathbf{H}_e\mathbf{Na}_2 , \mathbf{H}_e\mathbf{Ma}_2 , \mathbf{H}_e\mathbf{Al}_2 ,$

$\equiv \mathbf{H}_e\mathbf{Si}_2 , \mathbf{H}_e\mathbf{P}_2 , \mathbf{H}_e\mathbf{S}_2 , \mathbf{H}_e\mathbf{Cl}_2 , \mathbf{H}_e\mathbf{K}_2 , \mathbf{H}_e\mathbf{N}_2 , \mathbf{H}_e\mathbf{COH} , \mathbf{H}_e[\mathbf{HN}] ,$

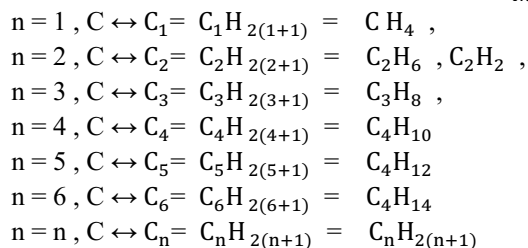
$\equiv \mathbf{H}_e[\mathbf{ON}_a] , \mathbf{H}_e[\mathbf{M}_a\mathbf{F}] , \mathbf{H}_e[\mathbf{OH}_2 + \mathbf{OH}_2] = \mathbf{H}_e[\mathbf{H}_2\mathbf{O}]_2 , \mathbf{H}_e[\mathbf{B}_e\mathbf{NH}] = \mathbf{H}_e\mathbf{B}_e\mathbf{NH}$

2..The Carbon Bonding : $\mathbf{C} |_{4N-VP}^{3D-Teh} \equiv \mathbf{C} |_4^{3D} | \leftrightarrow$ with Hydrogen and others is as ,

$\mathbf{C} | \frac{3D}{4P} | \leftrightarrow \mathbf{H}_1^0 \equiv \mathbf{C} [X_4^3]$, where at Nucleus-Bracket-Hook Index **4** , can be Placed Any
1-4 Elements of table Occupying , 1 to 4 , Charge-Positions .



The Compounds of Carbon are as $\rightarrow \mathbf{C} \leftrightarrow \mathbf{C}_n = \mathbf{C} \frac{3D}{4n-2(n-1)} = \mathbf{C}_n \mathbf{H}_{2(n+1)}$, and for



The Compounds of Carbon $\mathbf{C} | \frac{3D}{4P} | \leftrightarrow \{\mathbf{N} \frac{3D}{3P}\} \equiv [X_4^3] \rightarrow \mathbf{C} [X_{1-3}^{1-3}] \rightarrow \mathbf{CH}_3 \mathbf{N}_1 , \mathbf{CH}_2 \mathbf{N}_2 , \mathbf{CH}_1 \mathbf{N}_3$

The Compounds of Carbon $\mathbf{C} | \frac{3D}{4P} | \leftrightarrow \{\mathbf{O} \frac{2D}{2P}\} \equiv [X_2^2] \rightarrow \mathbf{C} [X_{1-3}^{1-3}] \rightarrow \mathbf{CO}_1 \mathbf{H}_3 , \mathbf{CO}_2 \mathbf{H}_3 , \mathbf{CO}_3 \mathbf{H}_1$
 $\rightarrow \mathbf{CO}_4 \mathbf{F}_1 , \mathbf{CO}_2$

The Compounds of Carbon $\mathbf{C} | \frac{3D}{4P} | \leftrightarrow \{\mathbf{F} \frac{3D}{1P}\} \equiv [X_{1-4}^3] \rightarrow \mathbf{C} [X_{1-3}^{1-3}] \rightarrow \mathbf{CF}_1 \mathbf{H}_3 , \mathbf{CF}_2 \mathbf{H}_3 , \mathbf{CF}_2 \mathbf{H}_2$
 $\rightarrow \mathbf{CF}_3 \mathbf{H}_1 , \mathbf{CF}_3 , \mathbf{CF}_4$

The Compounds of Carbon $\mathbf{C} | \frac{3D}{4P} | \leftrightarrow \{\mathbf{Ne} \frac{1D}{2P}\} \equiv [X_{2-4}^1] \rightarrow \mathbf{C} [X_{1-3}^{1-3}] \rightarrow \mathbf{CNe}_1 \mathbf{H}_2 , \mathbf{CNe}_2 \mathbf{H}_2 ,$
 $\rightarrow \mathbf{CNe}_3 \mathbf{H}_1$

The Compounds of Nitrogen $\mathbf{N} | \frac{2D}{3PP} | \leftrightarrow \{\mathbf{H} \frac{0D}{1P}\} \equiv [X_1^1] \rightarrow \mathbf{N} [X_1^1] \rightarrow \mathbf{NH}_3 , \mathbf{NHe}_1 \mathbf{Li}_1 , \mathbf{NH}_1 \mathbf{He}$
 $\rightarrow \mathbf{N Li}_2 \mathbf{H} , \mathbf{NHNa}_1 \mathbf{Cl} , \mathbf{N}_2 \mathbf{BeH} , \mathbf{NBe}_1 \mathbf{H} , \mathbf{NBH} ,$

The Compounds of Nitrogen $\mathbf{N} | \frac{2D}{3PP} | \leftrightarrow \{\mathbf{C} \frac{3D}{4NP}\} \equiv [X_{1-4}^{1-3}] \rightarrow \mathbf{N} [X_{1-4}^{1-3}] \rightarrow \mathbf{NCH}_3 , \mathbf{N}_2 \mathbf{CH}_2 , \mathbf{N}_1 \mathbf{H}$
 $\rightarrow \mathbf{N}_2 \mathbf{CH}_3 , \mathbf{N}_3 \mathbf{CH}_2 , \mathbf{N}_2 \mathbf{CH}$

The Compounds of Nitrogen $\mathbf{N} | \frac{2D}{3PP} | \leftrightarrow \{\mathbf{O} \frac{1D}{2NP}\} \equiv [X_{2-3}^{1-3}] \rightarrow \mathbf{N} [O_{2-3}^{1-3}] \rightarrow \mathbf{NKO}_3 , \mathbf{NHO}_3 , \mathbf{NPO}_3$
 $\rightarrow \mathbf{NOH} , \mathbf{NO}_2 \mathbf{H} , \mathbf{NO}_3 , \mathbf{KNO}_3 , \mathbf{N}_2 \mathbf{O} ,$

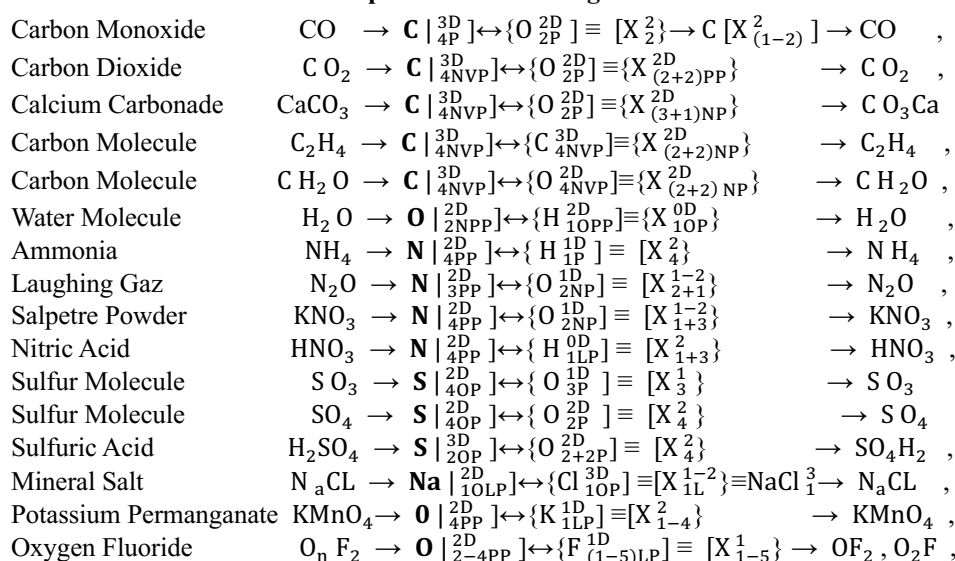
The Compounds of Nitrogen $\mathbf{N} | \frac{2D}{3PP} | \leftrightarrow \{\mathbf{Ne} \frac{3D}{20LP}\} \equiv [X_{1-2}^{1-3}] \rightarrow \mathbf{N} [\mathbf{Ne}_{1-2}^{1-3}]$, because for
Noble-Gaz-Atoms issues $\rightarrow \{\mathbf{R-M}\} = \sum_1^n m_i$, and so
 $\rightarrow \mathbf{NNeH}_1 , \mathbf{NNe}_2 \mathbf{Na} , \mathbf{NNe}_2 \mathbf{Cl} ,$

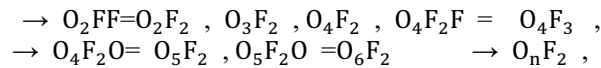
The Compounds of Nitrogen $\mathbf{N} | \frac{2D}{3PP} | \leftrightarrow \{\mathbf{Na} \frac{2D}{10P}\} \equiv [X_{3L}^1] \rightarrow \mathbf{N} [\mathbf{Na}_1^1] \rightarrow \mathbf{NNa}_1 , \mathbf{NHNa}_2 , \mathbf{NNa}_3$

The Compounds of Nitrogen $\mathbf{N} | \frac{2D}{3PP} | \leftrightarrow \{\mathbf{Ma} \frac{2D}{10P}\} \equiv [X_{3L}^1] \rightarrow \mathbf{N} [\mathbf{Ma}_1^1] \rightarrow \mathbf{NHMa}_1 , \mathbf{NKMa}_1 , \mathbf{NMa}_3$

The Compounds of Sodium $\mathbf{Na} | \frac{2D}{10P} | \leftrightarrow \{\mathbf{Cl} \frac{2D}{10P}\} \equiv [X_{1L}^{1-2}] \rightarrow \mathbf{Na} [\mathbf{Cl}_1^1] \rightarrow \mathbf{Na Cl} , \mathbf{NaCl}_2 , \mathbf{NaH} ,$

Some Molecule **Common - Compounds** from **Inorganic - Substances** .





Remarks :

- 1... Molecules are of the Three-Dimensional-Structure because follow the , Linear , Plane ,Volume Bonding Vectors , **Nucleus –Bracket -Hooks** , and at Pointy-Hooks , *the Glue sticking* , can be placed any Linear Atom-Vector . Bonding , follows the Material-Geometry-Structure rules from E-Geometry and the Fluorine Atom occupies the One-Strongest-Nucleus-Bracket-Hook and thus becomes the more Strongly molecule because of its energy $E = hf_F$ and also its size from Unit Energy relation $g = 2\pi.r^3f^2$.

The Bond angle must be always constant up to Oxygen Atom because of the min-Two-Hooks of the **Protons Stability Configuration** Bonding .

- 2... Oxygen and Fluoride occupy High energies because issues the frequency $f_{1X=O} = \sqrt{\frac{g}{2\pi.r^3}}$,

$$f_{1X=O} = \sqrt[3]{\frac{9,808}{2.\pi^3(9,2.10^{-11})^3}} = \sqrt{2,0316022.10^{29}} = 4,5073298.10^{14} \text{ H} , \text{ and for Fluorine ,}$$

$$f_{1X=F} = \sqrt[3]{\frac{9,808}{2.\pi^3(3,8.10^{-11})^3}} = \sqrt{28,824571.10^{29}} = 16,9778.10^{14} \text{ H}$$

- 3... The Vector-Structure of Fluorine , $4+4+1 = 9$, allows the One Vector to be Fixed on the other 8 resulting to the maximum Stress and consequently to the Strongest-Molecule .

The Bond Length is longer the others because intercedes the Two-Proton-Layers.Fig-41-

8-j... Fluorine , 9-Proton $[\oplus]$, 9-Electron $[\ominus]$, 10-Newtron $[\oplus \cup \cup \ominus] - [\oplus \leftrightarrow \ominus]$:

PROTON is composed of Three Elementary Particles as $\rightarrow [u u d] \equiv [+ \frac{2}{3} + \frac{2}{3} \frac{1}{3} + W^+] \equiv \left(+ \frac{3}{3} \right) [W^+ Z^+]$

Two **u**-Quarks and One **d**-Quark Interaction of Up-Quark **u** , and Up-Quark **u** , is $\rightarrow u u \equiv [+ \frac{2}{3} + \frac{2}{3} + W^+]$

$\equiv \Sigma_{D_A > D_A}^{[u u]}$ and the Summation of Up-Quarks $[u + u]$ of Cave D_A , **Attacks** >> Down-Quark $[d = -\frac{1}{3}]$ in Cave P_A OF STPL as (v) , creating the Destructive-Interference $[\oplus \rightarrow \ominus = +] \equiv DI_{0+}^{+-} \equiv Z^+$

Since ,u u, Summation occupies Constructive-Interference , **W**⁺, therefore is Stable .

The Process from measurements ,

1... DATA .

Up-Quark mass **m_u** = $8,91.10^{-30}$ Kg , Charge **q_u** = $[+\frac{2}{3}] . 1,602.10^{-19}$ C , Diameter **a** = $5,0.10^{-17}$ m ,

The Down-Quark **m_d** = $10,7.10^{-30}$ Kg , Charge **q_d** = $[-\frac{1}{3}] . 1,602.10^{-19}$ C, mean-Diameter **a** = $5,0.10^{-18}$ m

or , From **m_u** = $5,0.10^6 \text{ eV}/c^2 = (17,826614. 10^{-37}).5.10^6 \text{ Kg}$ then = $8,913307.10^{-30}$ Kg

m_d = $6,0.10^6 \text{ eV}/c^2 = (17,826614. 10^{-37}).6.10^6 \text{ Kg}$ then = $10,695968.10^{-30}$ Kg

2... THE SYSTEM .

The three Particles are Three Waves { $y_1 = \cos(kx-wt)$, $y_2 = \cos(kx-wt)$, $y_3 = \cos(kx-wt+\delta)$ } where , **δ** , is the Phase difference , **k** is the wave number , **x** is the wave Position and , **t** is the time which Interact as **One-Harmonic-mass-Resistor-System** as $\rightarrow [y_1 + y_2 \rightarrow y_3]$

$$\begin{aligned} \text{The System Total-Harmonic-Mass} &\equiv M_T \text{ is } \rightarrow \frac{1}{M_T} = \frac{2}{m_u} + \frac{1}{m_d} = \frac{2.10^{30}}{8,9133} + \frac{10^{30}}{10,696} = \\ &= \frac{30,305243.10^{30}}{95,336656} = \frac{10^{30}}{3,1458799} \text{ and , } M_T = 3,1458799.10^{-30} \text{ Kg} . \quad \dots\dots(1) \end{aligned}$$

The System Total - Harmonic-Charge $\equiv Q_T \equiv 2.q_u + q_d = 2.(2/3).e - (1/3).e = + \frac{3}{3}.e = + 1,6022.10^{-19} \text{ C}$, and the **System-Resonance-Charge** $Q_T = + 1,6022.10^{-19} \text{ C} \dots\dots(2)$ Unit-Cave **Frequency** is the Stationary-System becoming from Kepler second Planetary-law equation , $4\pi^2 m f_o^2 = k$, and constant law of Areas $l = k.f_o^2.a^3$.

Their common k , is the Constant-Energy $\rightarrow k = 4\pi^2 m f_p^2 = \frac{1}{f_p^2 a^3}$ or , $f_p^4 = \frac{1}{4\pi^2 m a^3}$ and $f_p = \sqrt[4]{\frac{1}{4\pi^2 m a^3}}$,

the frequency becoming from this equal **Resonance-Energy** is the one Mass frequency and is

$$f_{2u \rightarrow d} = \sqrt[4]{\frac{1}{4\pi^2 m a^3}} = \sqrt[4]{\frac{1}{4\pi^2 3,1458799.10^{-30}(5.10^{-19})^3}} = \sqrt[4]{805,18982.10^{80}} = 5,3269.10^{20} \text{ H}$$

The System's Energy is $E_{2u \rightarrow d} = h \cdot f_{2u \rightarrow d} = 6,62606957 \cdot 10^{-34} \cdot 5,3269 \cdot 10^{20} = 35,29641 \cdot 10^{-14}$ Joules / $1,6022 \cdot 10^{-19} \text{ C} = 22,029965 \cdot 10^5 \text{ eV} = \mathbf{2,2029965 \text{ MeV} \dots(3)}$

The Magnetic-fields laws for Charges and Periods are, $T = \frac{2\pi \cdot m \cdot T}{q \cdot B_F}$, $\bar{B}_F = \frac{2\pi \cdot m \cdot T}{q \cdot T} = \frac{|2\pi \cdot m \cdot T|}{Q_T} f$
so $\rightarrow \bar{B}_F = \frac{|2\pi \cdot m \cdot T|}{Q_T} f_{2u \rightarrow d} = \frac{2\pi \cdot [3,1458799 \cdot 10^{-30}] \cdot [5,3269 \cdot 10^{20}]}{1,6022 \cdot 10^{-19}} \text{ (Kg/Cs)} = \mathbf{65,7 \cdot 10^9 \text{ Tesla} \dots(4)}$

From Energy-Relation $W = 2E = B \cdot w = J \cdot w^2$, or $2E = 2\pi f B$ then **Total-Spin*Frequency**
 $\bar{B} f = \frac{E}{g}$, and $E = \bar{S} \cdot g \cdot f = 5,691952 \cdot 10^{-34} \text{ [Kg/m/s]} \cdot g \cdot [5,3269 \cdot 10^{20} \text{ H}] / 1,6022 \cdot 10^{-19} = 1,8562244 \cdot 10^6 \text{ eV} = \mathbf{1,85622 \text{ MeV}}$, i.e. **the Energy Produced from Total Spin-System.**

From Planck's length $a = \sqrt[3]{\frac{k}{f^2}}$ then $k = a^3 \cdot f^2$, and since **Energy** $E = k$, then **Cave** $a = \sqrt[3]{\frac{E}{f^2}}$
or **Action-Range** $a = \sqrt[3]{\frac{E}{f^2}} = \sqrt[3]{\frac{[22,029965 \cdot 10^5]}{(5,3269 \cdot 10^{20})^2}} = \sqrt[3]{7,763628 \cdot 10^{-36}} = 1,98010509 \cdot 10^{-12} \text{ m}.$

The Weak Forces, W^+Z^+ , in System is the Coulomb's Force $\rightarrow [u+u] > [d] \equiv [\frac{4}{3} - \frac{1}{3} + W^+Z^+]$
which may be calculated from the Time needed, for Harmonic-mass to vibrate in cave r , so
from Energy equation $r = \frac{m \cdot v}{q \cdot B} = \frac{[3,1458799 \cdot 10^{-30} \text{ Kg}] \cdot [2,9978 \cdot 10^8]}{1,6022 \cdot 10^{-19} \cdot [65,7 \cdot 10^9]} = \mathbf{8,959064 \cdot 10^{-14} \text{ m} \dots(5)}$

and for Weak Forces, W^+Z^+ , in cave $d = 10^{-14} \text{ m}$ then Period $T = \frac{d}{c} = \frac{8,959064 \cdot 10^{-14} \text{ m}}{[2,998 \cdot 10^8 \text{ m/s}]} = \mathbf{2,9883468 \cdot 10^{-22} \text{ s}}$, and The produced Energy in d , is $\rightarrow E_{W^+Z^+} = \frac{h}{T} = \frac{1,055 \cdot 10^{-34} \text{ J.s}}{2 \cdot [2,9883468 \cdot 10^{-22} \text{ s}] \cdot [1,602 \cdot 10^{-19} \text{ J/eV}]} = 1,10173 \cdot 10^6 \text{ eV} \equiv \mathbf{1,102 \text{ MeV} \dots(6)}$ and from Coulomb

Force $F_C = \frac{C \cdot Q}{r^2}$ and Voltage $V_C = \frac{C \cdot Q}{r}$, Then **Force** $[F_C] \times \text{Cave } [r] = \text{Voltage } [V_C] \rightarrow \text{so}$

Weak-Forces $W^+Z^+ = [\frac{E_{W^+Z^+}}{r}] = \frac{1,1017 \cdot 10^6}{8,959064 \cdot 10^{-14}} = \mathbf{1,229736 \cdot 10^{19} \text{ eV} \dots(7)}$ and or from Weak-Forces

$W^+Z^+ \equiv [\frac{h/T}{2 \cdot r}] \equiv [\frac{h \cdot c/d}{2 \cdot r}] \equiv \frac{h \cdot c}{2 \cdot d \cdot r} \equiv [\frac{h \cdot c}{2 \cdot e \cdot r^2}] \text{ eV} = \frac{1,055 \cdot 10^{-34} \text{ J} \cdot [2,998 \cdot 10^8 \text{ m/s}]}{2 \cdot [1,602 \cdot 10^{-19} \text{ eV}] \cdot [8,95906 \cdot 10^{-14}]^2} = \mathbf{1,2297 \cdot 10^{19} \text{ eV}}$

ELECTRON :

Electron is created through the vibration, f_n , in the **Unit-Energy-Space**, $g - \pi$, **meters** and thus follows both Rotational and Linear motion, and so the **Constant-Energy**, k , is the same for both.

From M-Point, frequency $\rightarrow f_N = n \frac{(1+\sqrt{5})\sigma}{4\pi r}$, and $\rightarrow w = 2\pi \cdot f_N = n \frac{(1+\sqrt{5})\sigma}{2r} = \left| \frac{n}{r} \right| \cdot \frac{(1+\sqrt{5})\sigma}{2}$. The **Spring-like**

Central-force from a fix Point, *the Source*, on an attached, *Probe*, mass is $\rightarrow F = -k \cdot r = -k \cdot r \cdot \bar{r}$, as equation $\ddot{x} + w^2 x = 0 \dots\dots(1a)$ with a general solution, $x = A \sin w_n t + B \cos w_n t$, where A, B are constants and evaluated from the initial velocity conditions and which become as $x = [\dot{x}(0)/w_n] \cdot \sin w_n t + x(0) \cdot \cos w_n t \dots(1)$

The Natural-frequency in Planck's length for the **Primary-Particle** occupying The, less **Negative-charge frequency, is the Electron**, and is as equation (1) with solution,

$$\frac{w_n}{2\pi} = f_e = \frac{1}{2\pi} \sqrt{\frac{k}{m}} \text{, or } 4\pi^2 f_e^2 \cdot m_e = k = \pi g \text{ and } \rightarrow m_e = \frac{g}{4\pi f_e^2} \dots\dots(2)$$

where $k = \text{Unit-Spring-Force} \equiv [\text{meter of area}] \cdot [\text{meter of force} \equiv \text{Stress}] \equiv \pi g \dots\dots(2a)$

From Planck's equation $f_e = E/h = [-13,6 \times 1,602 \cdot 10^{-19} = 2,17872 \cdot 10^{-18} \text{ Joule}] / [6,626 \cdot 10^{-34} \text{ Js}]$

$= \mathbf{3,2881029 \cdot 10^{15} / s}$, where min-energy -13,6 eV is that of Hydrogen atom. Substituting

all the **minimum-meters of Planck's scale** Then, **Electron mass is**,

$$m_e = \frac{g}{4\pi f_e^2} = \frac{9,8076754}{4 \cdot \pi \cdot [3,2881 \cdot 10^{15}]^2} = \mathbf{-7,219016 \cdot 10^{-32} \text{ kg} \dots\dots(2b)}$$

$$f_e = \mathbf{3,2881029 \cdot 10^{15} / s} \text{, and } L_e = \mathbf{1,6819781 \cdot 10^{-17} \text{ m} \dots\dots(2c)}$$

Equations become from relation $\rightarrow 4\pi \cdot f_e^2 \cdot m_e = g \leftarrow$ In Planck's length, **e - Charge** Becomes through the **One way- N -Electric-Paths** $[\oplus \leftrightarrow \ominus]$, which formulate the **Electric Field-Pattern**, following the Charge-equation $\rightarrow \bar{q} \equiv \frac{m_e \cdot c^2}{2} = \frac{g \cdot c^2}{8\pi f_e^2}$. **Gravitational Force** is equal to $\rightarrow$ The Geometric-Resultant of Light-velocity c , and is acting on **Electron-Unit-Charge** $\bar{q} \leftarrow$ or, $G = c \sqrt{2} \bar{q}$, so then is Electron-Charge

$$\bar{q}_{\text{Electron}} = \frac{G}{c \sqrt{2}} = \frac{6,6736923 \cdot 10^{-11}}{1,41429 \cdot 2,9979346 \cdot 10^8} = 1,574 \cdot 10^{-19} \text{ C}.$$

The above Electron, e^- , and $\bar{q}_E = \frac{G}{c \sqrt{2}}$, differs from the Conductor's $[\frac{d = BC_E}{BC_E}] = \frac{-3q}{3}$, to the Positions these are Created, the first in, **before Planck's length**, and That of Conductor's in, **after Planck's length**.

Neutron is composed of three Elementary Particles , the Down-Quarks-d and Up -Quark-u which combine as ,

NEUTRON is $\rightarrow [d d u] \equiv [-\frac{1}{3} - \frac{1}{3} + \frac{2}{3} + W^-] \equiv (0 | W^- Z^0) =$ Two **d**-Quarks and One **u**-Quark.

Interaction of Down-Quark **d** , and Down-Quark , **d** , is $\rightarrow d d \equiv [-\frac{1}{3} - \frac{1}{3} + W^-] \equiv \Sigma_{P_A > P_A}^{[d+d]}$, and

The Summation of Down - Quarks $[d + d]$ of Cave P_A , **Is attacked** $\rightarrow <<$ by the , Up-Quark

$[u = +\frac{2}{3}]$ in Cave D_A Of STPL as relation (v) , **OR** Positive Up-Quark $[u = +\frac{2}{3}]$ **Attacks** $>>$

The Down-Quarks $[d + d]$ of Cave P_A of STPL , and creates the Destructive-Interference as ,

$[\oplus \rightarrow \ominus = 0] \equiv [+ \frac{2}{3} - \frac{2}{3} + Z^0]$ or , $CI \rightarrow \ominus \equiv [W^-] + DI \rightarrow \ominus \equiv Z^0$ and $[d d u] \equiv (0 | W^- Z^0)$

The Process from measurements :

1 DATA .

The Down-Quark-mass $m_d = 10,7.10^{-30}$ Kg , Charge $q_d = [-\frac{1}{3}].1,602.10^{-19}$ C,

mean-Diameter $a = 5,0.10^{-18}$ m . Up-Quark mass $m_u = 8,91.10^{-30}$ Kg ,

Charge $q_u = [+ \frac{2}{3}].1,602.10^{-19}$ C , Diameter $a = 5,0.10^{-17}$ m , Or ,

From $m_d = 6,0.10^6$ eV/c² $\rightarrow (17,826614. 10^{-37}).6.10^6$ Kg = $10,695968.10^{-30}$ Kg

$m_u = 5,0. 10^6$ eV/c² $\rightarrow (17,826614. 10^{-37}). 5.10^6$ Kg = $8,913307.10^{-30}$ Kg

2... THE SYSTEM .

The Three Particles are the Three Waves $\{ y_1 = \cos(kx - \omega t) , y_2 = \cos(kx - \omega t) , y_3 = \cos(kx - \omega t + \delta) \}$

where , δ , is the Phase difference , **k** is the wave number **x** , is the wave Position and , **t** is the time

which Interact as **One-Harmonic-mass-Resistor-System** $\rightarrow [y_1 + y_2 \rightarrow y_3]$

The System Total-Harmonic-Mass $\equiv M_T$ is $\rightarrow \frac{1}{M_T} = \frac{2}{m_d} + \frac{1}{m_u} = \frac{2.10^{30}}{10,696} + \frac{10^{30}}{8,9133}$
 $= \frac{28,522108.10^{30}}{95,336656} = \frac{10^{30}}{3,3425529}$ and Resonant-mass , $M_T = 3,3425529. 10^{-30}$ Kg(1)

The System Total- Harmonic-Charge $\equiv Q_T \equiv 2.q_d + q_u = 2.(-1/3).e + (2/3) e = 0 e$,
 and the **System-Resonant-Charge** $Q_T = 0$ C(2)

Frequency Unit-Cave is the Stationary-System becoming from Kepler second Planetary - law equation $4 \pi^2 m f_o^2 = k$, and constant law of Unit-Areas $l = k . f_o^2 . a^3$. Their common **k** , is

the Constant-Energy $\rightarrow k = 4 \pi^2 m f_p^2 = \frac{1}{f_p^2 a^3}$ or , $f_p^4 = \frac{1}{4 \pi^2 m a^3}$ and $f_p = \sqrt[4]{\frac{1}{4 \pi^2 m a^3}}$, so

the frequency becoming from this equal Resonance-Energy is The one Mass frequency and is

$f_{2u \rightarrow d} = \sqrt[4]{\frac{1}{4 \pi^2 m a^3}} = \sqrt[4]{\frac{1}{4 \pi^2 3,3425529.10^{-30} (5.10^{-19})^3}} = \sqrt[4]{606,25053. 10^{80}} = 4,962072.10^{20}$ H

The System's Energy is $E_{2d \rightarrow u} = h.f_{2d \rightarrow u} = 6,62606957.10^{-34} . 4,962072.10^{20} =$

$32,879031.10^{-14}$ Joules / $1,6022.10^{-19}$ C = $20,521177.10^5$ eV = **2,0521177 MeV**(3)

Lorentz Force $F = q.(\vec{v} \times \vec{B})$ shows that + q charges turn Right while -q charges turn Left .

The Magnetic-fields laws for Charges and Periods are, $T = \frac{2 \pi . m_T}{q . B_F}$, $\vec{B}_F = \frac{2 \pi . m_T}{q . T} = \frac{|2 \pi . m_T|}{Q_T} f$

so $\rightarrow \vec{B}_F = \frac{|2 \pi . m_T|}{Q_T} f_{2d \rightarrow u} = \frac{2 \pi [3,34255.10^{-30}] 4,962072.10^{20}}{1,6022.10^{-19}} (Kg/Cs) = \mathbf{409.10^9}$ Tesla.(4)

From Energy-Relation $W = 2E = B w = J . \omega^2$, or **2E = 2 π f B** Then **Total -Spin*Frequency**

$\vec{B} f = \frac{E}{g}$, and $E = \vec{S} . g . f = 5,691952.10^{-34} \{Kg/m/s\} . g . [4,962072.10^{20} H] / 1,6022.10^{-19} =$
 $17,289721.10^6$ eV = **17,289 MeV** , i.e. **The Energy Produced from Total Spin-System** .

From Planck's length $a = \sqrt[3]{k/f^2}$ then $k = a^3 . f^2$, and since **Energy** $E = k$ then Cave $a = \sqrt[3]{E/f^2}$

or **Action-Range** $a = \sqrt[3]{\frac{E}{f^2}} = \sqrt[3]{\frac{[17,289721.10^5]}{(4,962072.10^{20})^2}} = \sqrt[3]{7,0220166. 10^{-36}} = 1,91493462.10^{-12}$ m

The **Weak Forces** , **W⁻ Z⁰** , in System is the Coulomb's Force $\rightarrow [d+d] > [d] \equiv [-\frac{2}{3} + \frac{1}{3} + W^- Z^0]$

which may be calculated from the Time needed , for Harmonic-mass to vibrate in cave **r** ,

from Energy equation $r = \frac{m.v}{q.B} = \frac{[3,3425529.10^{-30} Kg] 2,9978.10^8}{1,6022.10^{-19} [409.10^9]} = \mathbf{1,52911.10^{-14}}$ m(5)

and for Weak Forces , **W⁻ Z⁰** , in cave **d = 10⁻¹⁴ m** , Then Period $T = \frac{d}{c} = \frac{1,52911.10^{-14} m}{[2,998.10^8 m/s]} =$

$= \mathbf{5,100773.10^{-23}}$ s , and The produced Energy in **d** , is $\rightarrow E_{W^- Z^0} = \frac{h}{T} =$
 $\frac{1,055.10^{-34} J.s}{2.[5,100773.10^{-23} s].[1,602.10^{-19}]/eV]} = 6,4554113.10^6$ eV $\equiv$ **6,455 MeV**(6) and from Coulomb

Force $F_C = \frac{C.Q}{r^2}$ and Voltage $V_C = \frac{C.Q}{r}$, Then **Force** $[F_C] \times \text{Cave } [r] = \text{Voltage } [V_C] \rightarrow \text{so}$
 Weak-Forces $W^-Z^0 = \left[\frac{E_{W^-Z^0}}{r} \right] = \frac{6,4554.10^6}{1,52911.10^{-14}} = 4,22141.10^{20} \text{ eV} \dots (7)$ or from Weak-Forces
 $W^-Z^0 = \left[\frac{h/T}{2.r} \right] = \left[\frac{h.c/d}{2.r} \right] = \frac{h.c}{2.d.r} = \left[\frac{h.c}{2.e.r^2} \right] \text{ eV} = \frac{1,055.10^{-34} \text{ J} \cdot [2,998.10^8 \text{ m/s}]}{2 \cdot [1,602.10^{-19} \text{ eV} \cdot [1,52911.10^{-14}]^2]} = 4,22141.10^{20} \text{ eV}$

Since $[d \ d \ u]$ Summation occupy the **Zero-Constructive-Interference** Therefore is Stable ,
 And the Forces (W^- , Z^0) are equal and Opposite as $\rightarrow [W^- + Z^0 = 0] \equiv [\ominus \leftarrow \oplus \rightarrow \ominus] \leftarrow$
Summarizing The above and setting them in **Fluorine-Atom** then ,

a-**Proton** $\oplus \rightarrow$ mass $m_p = 3,146.10^{-30} \text{ Kg} \rightarrow$ Charge $C_p = 1,602.10^{-19} \text{ C} \rightarrow d = 9,1.10^{-15} \text{ m}$
 b-**Electron** $\ominus \rightarrow$ mass $m_e = 9,1.10^{-31} \text{ Kg} \rightarrow$ Charge $C_e = 1,602.10^{-19} \text{ C} \rightarrow d = 5,0.10^{-17} \text{ m}$
 c-**Neutron** $[\oplus \leftrightarrow \ominus] \rightarrow$ mass $m_n = 3,342.10^{-30} \text{ Kg} \rightarrow$ Charge $C_n = 0,0 \text{ C} \rightarrow d = 7,6.10^{-15} \text{ m}$

The Nucleus Total-Harmonic mass $\equiv M_T$ is $\rightarrow \frac{1}{M_T} = \frac{9}{m_p} + \frac{10}{m_n} + \frac{9}{m_e} = \frac{9.10^{30}}{3,146} + \frac{10.10^{30}}{3,342} + \frac{9.10^{31}}{9,11}$
 $= \frac{10^{30}}{0,349555} + \frac{10^{30}}{0,3342555} + \frac{10^{30}}{10,122222} = \frac{10^{30}}{1,6803072}$, and $M_T = 1,680307.10^{-31} \text{ Kg} \dots (1)$

The Nucleus-Orbit Total-Harmonic-Charge $\rightarrow Q_T = 9.q_p + 9.q_e + 0.q_n = 28,8396.10^{-19} \text{ C}$
 and the **Resonance - System from Charges** is $Q_T = 2,88396.10^{-18} \text{ C} \dots (2)$

The frequency of the Closed-Nucleus-Orbit-System becomes from Kepler second Planetary law equation
 $4\pi^2 m f^2_o = k$, and constant law of Areas $l = k \cdot f^2_o \cdot a^3$. Their common k, is the common constant energy

$$k = 4\pi^2 m f^2_o = \frac{1}{f^2_o a^3} \text{ or, } f^4 = \frac{1}{4\pi^2 m a^3} \text{ and } f = \sqrt[4]{\frac{1}{4\pi^2 m a^3}} \text{ measured ,}$$

$$f = \sqrt[4]{\frac{1}{4\pi^2 m a^3}} = \sqrt[4]{\frac{1}{4\pi^2 1,680307.10^{-31} (2,1127839.10^{-11})^3}} = \sqrt[4]{15,87188.10^{60}} = 1,995984.10^{15} \text{ H} \dots (3)$$

According to Planck $E = hf = 6,62606957.10^{-34} \cdot 1,995984.10^{15} = 1,322553.10^{-18} \text{ Joules}$ and ,

The System $M_T = \text{masses}$, $Q_T = \text{Charges}$ creates a constant Magnetic-field $\bar{B}_F = \left| \frac{2\pi M_T}{Q_T} \right| f$

M-field $\bar{B}_F = \left| \frac{2\pi M_T}{Q_T} \right| f = \frac{2\pi \cdot 1,680307.10^{-31} [1,995984.10^{15}]}{6,4044.10^{-18}} (\text{Kg/Cs}) = 3,2902905.10^{-2} \text{ Tesla} \dots (4)$

$\bar{B}_F = 0,003291 \text{ Tesla} \rightarrow \text{The Magnetic-Field Strength of a Sunspot.}$

1Tesla = $[N.s / C.m] = [N / \text{Ampere}.m] = [Kg / C.s] = 10^4 \text{ Gauss} = 10^{-3} \text{ Millie-Tesla.}$

For cave $a = \sqrt[3]{T^2/g} = \sqrt[3]{1/g f^2} = \sqrt[3]{1/g [1,995984.10^{15}]^2} = 2,34054021.10^{-9} \text{ m}$ Energy
 equation $E = \frac{1}{a^3} \left[\frac{4\pi^2}{c^2} + \frac{L^2}{2m} \right]$ where $L =$ the Spin $S = 5,691952.10^{-34} \{Kg/m/s\}$, and R-mass
 $M_T = 1,680307.10^{-31} \text{ Kg}$ of System, $c \equiv 2,998.10^8 \text{ m/s}$. $E = [1,825441.10^{19}] \times [\Sigma] =$
 $[4,392086.10^{-16} + 1,000000.10^{-36}] = 8,0174938.10^3 \text{ J} + 2.10^{-17} \text{ J} \dots (E)$

i.e. 1...Energy in Fluorine-Orbit, **The One-Nucleus-Bracket-Hook**, is 8017,4938 J, such as The Energy in an Alkaline AA Battery. Energy in Fluorine-Bracket-Charge Hook 2.10^{-17} J and is The Energy needed, **The Path-Way**, for X-Ray Photons to succeed Metabolism of Carbohydrate-Protein to Biopolymers and to other Substances. This Dual Property of Fluorine-Atom is as that of Dual-Photon $\{ \bar{c} \cdot \bar{f}_n + \bar{c} \cdot f_n \}$ where, $\bar{c} \cdot \bar{f}_n \equiv \text{The-Storage} \rightarrow \text{Particle}$, $\bar{c} \cdot f_n \equiv \text{Information} \rightarrow \text{Wave}$, and through Photosynthesis the conversion of the Light-Energy into Chemical-Energy.

2... Since Energy $E = \frac{1}{a^3} \left[\frac{4\pi^2}{c^2} + \frac{L^2}{2m} \right] = 8.10^3 \text{ J} + 2.10^{-17} \text{ J}$, is composed of these two Parts, The one in whole **Atom**, the **Translational**, and the other, the **Rotational motion**, in the **Bracket – Hook - charge**. Stationary Fluorine occupies the Property of the moving Photon and for both, in Atoms Molecules and Crystals, exists, $2r = \Delta = \frac{g}{k}$ meaning that Hook is an Energy loop. Equation of Dual-Energy becomes from the solution of Lagrange 2nd kind equation of motion where the Lagrangian contains all information for the two kind of motions, Bonding of *motion and Positions*, as above to the Total System. This is The-Why Atoms-Bonds with multiple number of electrons and follow the Ionic Bonding.

3... Since Bonding is **Permutation of Positions** so, The Number of **Charge-Hooks** defines the Bonding and when are all occupied by One-Vector-Hook then Bonding Stops. Such is the case of Carbon with the 4

Hooks when occupied by 4 Hydrogen Vectors CH_4 . In Order to Bond with , F , Fluorine must be dissolved to 3 H and then to rebuild as CH_3F , or to CH_3OF , or to any Two-Vector-Hook . Bonding follows the Von Mises **Elastic Limit** of Principal Stresses $\sigma_z = \frac{\sigma}{\sqrt{3}}$, or $\sigma = \frac{F}{A} = \frac{2\pi a f}{\Phi} = \frac{2\pi a}{\Phi} \left[\sqrt[4]{\frac{1}{4\pi^2 m \cdot a^3}} \right]$ where Action-Range $a = \sqrt[3]{1/g f^2}$, in order that The Generated-Molecule is Stable [89] .

9-j... The Structure of CO_4F .

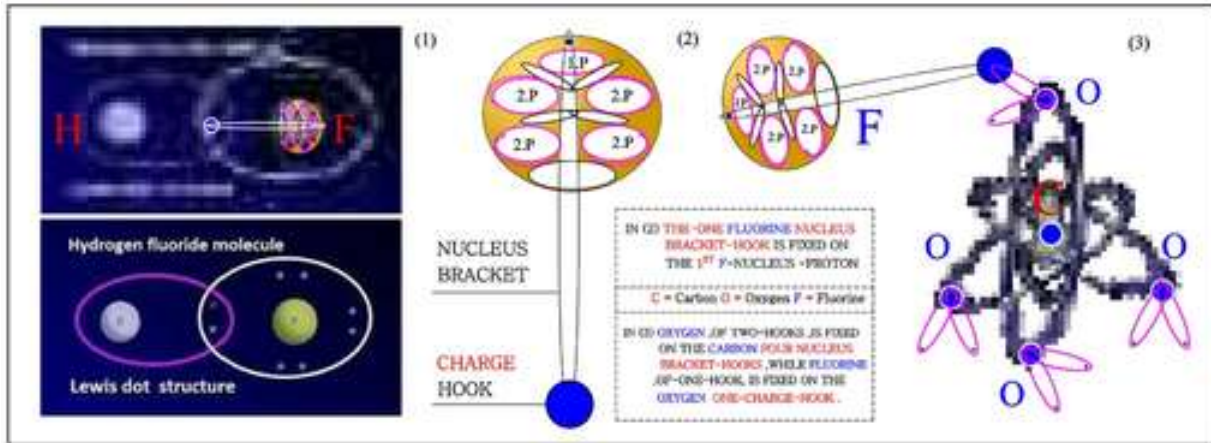


Figure – 44. The Fluorine-Oxygen-Carbon Molecule is the Strongest Molecule.

Carbon mass $\rightarrow m_C = 1,9888594 \cdot 10^{-30} \text{ Kg} \rightarrow 6 \text{ Protons , 6 Electrons , Four- Bracket-Hooks}$
 Oxygen mass $\rightarrow m_O = 2,6492848 \cdot 10^{-30} \text{ Kg} \rightarrow 8 \text{ Protons , 8 Electrons , Two - Bracket-Hooks}$
 Fluorine mass . $\rightarrow m_F = 3,1458799 \cdot 10^{-30} \text{ Kg} \rightarrow 9 \text{ Protons , 9 Electrons , One - Bracket-Hook .}$

a.. As in Electricity issues , **The Parallel Connections Resistors** $\frac{1}{R_T} = \left[\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots \right]$ and this also , from **Conservative-Energy-System** motion where masses follow the equation $\frac{d}{dt}(mr) - mr \cdot \omega^2 = 0$, or motion , $\ddot{r} = r \cdot \omega^2$, of **The-One-mass-System**.

The **Harmonic-Mean-Mass** on the Center of the 3 masses is $\frac{1}{m_{2+1}} = \left[\frac{1}{m_1} + \frac{1}{m_2} + \frac{1}{m_3} \right]$
 $= \left[\frac{10^{27}}{26,566} + \frac{10^{27}}{1,67355} + \frac{10^{27}}{1,67355} \right] = \frac{1}{m_{2+1}} = \frac{10^{27}}{0,811223}$, or $\rightarrow m_{3T} = 8,112232 \cdot 10^{-28} \text{ Kg}$

b.. From eq.(c) $f_{3T} = \sqrt[4]{\frac{1}{4\pi^2 m a^3}} = \sqrt[4]{\frac{1}{4\pi^2 \cdot 8,1122 \cdot 10^{-28} \cdot 9,45418 \cdot 10^{-33}}} = \sqrt[4]{3,3027653 \cdot 10^{56}} =$
 $f_{3T} = 1,3480916 \cdot 10^{14} /s$, which is the **Resonance-frequency** of CO_4F Molecules .

c.. From cave-relation , a cave , is $a = d = \sqrt[3]{\frac{1}{9,808 \cdot f_{3T}^2}} = \sqrt[3]{5,6102298 \cdot 10^{-30}} =$

$a_{Fm} = 1,77688867 \cdot 10^{-10} \text{ m}$, then **Bracket-Hook** $\Delta_{Fm} = 2a = 3,5537772 \cdot 10^{-10} \text{ m}$, and with the same measurements for Hydrogen $\rightarrow \Delta_H = 3,90253318 \cdot 10^{-11} \text{ m}$

$\Delta_C = 2a = 8,889927 \cdot 10^{-11} \text{ m} \rightarrow f_C = 1,0774756 \cdot 10^{15} \text{ H}$
 $\Delta_O = 2a = 8,737318 \cdot 10^{-11} \text{ m} \rightarrow f_O = 1,0693626 \cdot 10^{15} \text{ H}$
 $\Delta_F = 2a = 4,7983275 \cdot 10^{-11} \text{ m} \rightarrow f_F = 0,9606715 \cdot 10^{15} \text{ H}$
 $\Delta_{F-mol} = 2a = 35,537772 \cdot 10^{-11} \text{ m} \rightarrow f_{F-mol} = 0,13480916 \cdot 10^{15} \text{ H}$

i.e.. If 4-Hydrogens are Placed on the , **Carbon** , **4-[Bracket-Orbit-Hook] $\equiv$ BOH** , then Bonding Proceeding Stops because System lacks of Positions .

IF On Carbon - Slit - Nucleus , (6 - 2 = 4) , of the **FOUR [Bracket-Orbit -Hooks]** $\Delta_C \equiv 2a = 35,537772 \cdot 10^{-11} \text{ m}$, are Placed **4 Oxygen** as 3 - Oxygen **Orbit -Vectors** $\equiv \Delta_O \equiv$ of Two Plane , Line-Vectors and Fixed at **Plane angle** $> 90^\circ$, and On the **4-th** Oxygen Vector Placed the **Fluorine** , which is $\rightarrow$ **The ONE-[Bracket- Orbit- Hook] with One Charge edge** , $\ominus$, and Energy , $E = U(x)$, **Joint with an Positive Proton** $\oplus$ of **Fluorine** , THEN CO_4F a stable molecule is generated , following v-M **Elastic-Limit**. Since Hydrogen and Fluorine are both of **1-[Bracket-Orbit-Hook]** so stick together .

d.. The Strong Carbon of 4-Brackets is joint with the Oxygen of 2-Brackets and the Fluorine of 1-Bracket follows Free-Occupied Positions , as {Up-Index $\equiv$ Free-Positions | F | ,Down-Index $\equiv$ Free-Positions | o |} . Structure $\text{CO}_4\text{F} \rightarrow \text{C} \left| \begin{smallmatrix} \text{Free} \\ \text{occupied} \end{smallmatrix} \right| = 4 \rightarrow \text{O} \left| \begin{smallmatrix} \text{F} \\ \text{o} \end{smallmatrix} \right| = 2 \rightarrow \text{F} \left| \begin{smallmatrix} \text{F} \\ \text{o} \end{smallmatrix} \right| = 1 \equiv \text{CO} \left| \begin{smallmatrix} \text{F} \\ \text{o} \end{smallmatrix} \right| = 4 \rightarrow \text{COF} \left| \begin{smallmatrix} \text{F} \\ \text{o} \end{smallmatrix} \right| = 3 \dots\dots\dots(s)$

Structure (s) is a Molecules with 4 occupied Positions and 3 Free Positions with the Possibility of further Bonding . For Free-Positions $\equiv$ occupied-Positions then for 2C is , $C|_{|F|=4}^{F=4} \rightarrow C|_{|F|=4}^{F=4} \equiv CC|_{|F|=4}^{F=4}$, or $CC|_{|F|=0}^{F=0}$, or , $CC|_{|F|=6}^{F=6}$, or , $CC|_{|F|=4}^{F=4}$, or , $CC|_{|F|=2}^{F=2}$, or , $CC|_{|F|=8}^{F=8}$, i.e. **Bonding $\equiv$ Positions.**

10-j...The Photo - Stress Method on Atoms-Plane-Brackets :

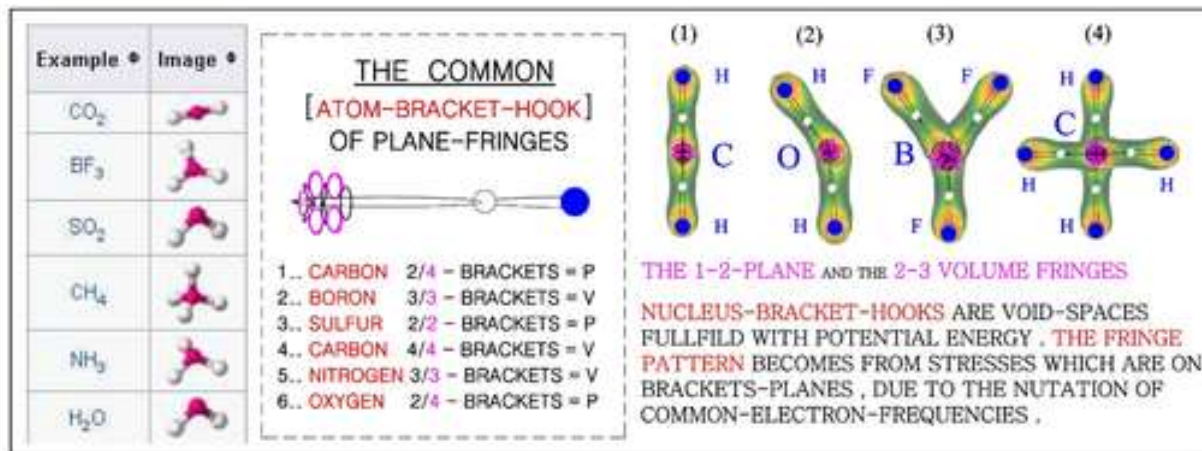


Figure – 45. The Photo Stress Fringes in Atoms-Compounds and Molecules .

The Photo Stress Method is used to measure the **Surface-Strains** in any Part of an Solid-Structure . In Mechanics , **Material - Systems** $\equiv$ Systems Possessing mass and Elasticity , issues Principle that of < Degrees of freedom > .The **Configuration-Fringes-System** consists the **Space-Part** And their Colors $\equiv$ **Principal-Stresses** Consists the **Energy-Part** of the System .

Since Electromagnetic waves are Polarized to $\rightarrow$ Electric and the transverse Magnetic Fields , Therefore , their speed , *their velocity* , depends on the medium's indices of Refraction n_R .

From the **Nucleus-Bracket-Hook** , either in Plane as is for Helium , Lithium , Beryllium , or in Volume as is Boron , Carbon , Nitrogen , their **Bracket-axes specify a fast and slow direction** because of the Birefringence of the Propagating of light . Their Plane or Volume is subjected to the **Stress** $\rightarrow$

$$\sigma = \frac{\text{Force}}{\text{Area}} = \frac{2\pi r}{\Phi} f , \text{ or from } f_n = v / 2\pi r = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\sigma \cdot \Phi}{2\pi \cdot r_n} , \text{ and is Produced from the Resonance frequency , } f_n , \text{ becoming from the Common- Electron- Nutation } \equiv \text{CEN} .$$

The common-Nutation occurs on the Atoms-Compound-Bonding-Orbit , differently Brackets without electron lack of Nutation . In Fig-45. , CO₂ , or the Two Tuning-Fork-Brackets , is modeled as an Electrical network RLC circuit , with low Impedance , *series* , and high Impedance , *Parallel* , resonance . The Two Brackets distort and an alternate Voltage is generated as $U = U_o \cdot \sin(2\pi \cdot f_n t) = 2\pi \cdot U_o \cdot \sin(f_n t) = i \cdot \sqrt{R^2 + (wL)^2 + (wC)^{-2}}$ and current i .

Each Bracket of Atom rotates the Polarization of light according to the amount of local stress and the Stress-Optic coefficient of the Bracket . This Rotation creates the **Visual-Pattern** of the alternating **Bright and Dark Fringes** , *in the Configuration-Fringes-System* , within the Atom-Compound or molecule , and which Visual-Pattern is dependent on the Orientation of the Brackets . Since also Electromagnetic-Waves travel in a direction co Perpendicular to the Sinusoidal Electric and Magnetic-Fields of which they are comprised , therefore the Pattern follows the Shape of Atom-Compound and the How this is Stressed . [96] . The Procedure is $\rightarrow$

From the Theory of Elasticity $\epsilon_x - \epsilon_y = \frac{\delta}{2dK} = \frac{N \cdot \lambda}{2dK} \dots\dots\dots(1) \text{ where ,}$

$\epsilon_x , \epsilon_y \equiv$ The Principal-Strains of two Perpendicular directions $x \perp y$,

$d \equiv$ The Thickness of a Plate-Surface as that of the two or four Brackets ,

$K_{soc} \equiv$ The **Strain-Optical-coefficient** and equal to $\frac{n_x - n_y}{\epsilon_x - \epsilon_y}$,

$K_{\rightarrow soc} \equiv$ The **Stress-Optical-coefficient** and equal to $\frac{n_x - n_y}{2[\epsilon_x - \epsilon_y]}$,

$n_x , n_y \equiv$ The Index of Refraction in , x , y , direction ,

$\delta \equiv$ The Retardation between two Waves as is , $\delta = d(n_x - n_y) = 2d \cdot K_{soc} \cdot (\epsilon_x - \epsilon_y)$,

$\lambda \equiv$ The Wavelength of the Electromagnetic wave , and for White-light $= 575 \cdot 10^{-9} \text{m}$

The Light-Intensity is $\rightarrow I = E_x^2 \cdot \sin^2\left[\frac{\pi \cdot \delta}{\lambda}\right] = E_x^2 \cdot \sin^2\left[\frac{\pi \cdot \delta}{c}\right] \cdot f$, and the Principal-Stresses

$$\sigma_x - \sigma_y = \frac{E}{1+\nu} \left[\frac{N \cdot \lambda}{2dK} \right] = \frac{E}{2(1+\nu)K} \left[\frac{N \cdot \lambda}{d} \right], \text{ and the Shear } \tau_{\max} = \frac{\sigma_x - \sigma_y}{2} = \frac{E}{4(1+\nu)K} \left[\frac{N \cdot \lambda}{d} \right], \text{ where is ,}$$

$\sigma_x, \sigma_y \equiv$ The Principal-Stresses of two Perpendicular directions $x \perp y$,

E_x, E_y = The Intensity at the maximum Displacements between Principal Strains

E = The Young's Elastic modulus of the Brackets-Plate ,

ν = The Poisson's ratio , and Retardation due to the Principal Stresses is as ,

$$\sigma_x - \sigma_y = \left[\frac{K \rightarrow \text{soc}}{d} \right] \cdot \bar{N} = \left[\frac{K \rightarrow \text{soc}}{d} \right] \cdot \left[\frac{\delta}{2\pi} = \frac{N \cdot \lambda}{2\pi} \right] = \left[\frac{K \rightarrow \text{soc}}{d} \right] \cdot \frac{N \cdot \lambda}{2\pi} \dots\dots\dots(2)$$

From above relations is concluded ,

- 1... The **Effect of Gravity** , g , on {Common to Compound-Bracket} **Atom-Electron-mass** , Originates **Electron-Nutation** , θ , in Electron-Precession , ϕ , and Changes the Electron **Spin-Direction** ψ . The Produced-Energy is stored in **Magnetic field** $\bar{B}_N = 2\pi \cdot m_e \cdot f_N / \bar{q}_N$ as the **Resonance frequency** $f_N = \left[\frac{SQ}{2\pi J_3 W} \right] \equiv f_R = 2,8398447 \cdot 10^{10} \text{ s}^{-1}$. (6e.)

The Quantum-Energy $E = h f_N = 6,62606957 \cdot 10^{-34} \cdot 2,839844 \cdot 10^{10} \text{ H} / 1,6022 \cdot 10^{-19} \text{ eV} = 1,17444789844 \cdot 10^{-4} \text{ eV}$, and it is a small Quantity in Quantum-Energy field .

Nevertheless , the above Quantity on Brackets **causes the vibration** at their **Natural Frequency** that is needed to form the **Stresses on Brackets** , through which the Light velocity c , of the Dual Property formulates the **Energy-Fringes-Pattern** .

- 2... From relation of Stress $\sigma = \frac{2\pi r f}{\Phi} = \frac{w \cdot r}{\Phi} = \frac{v}{\Phi}$, and Light-velocity c , in **Brackets-Material**

Plane results the Propagating Electromagnetic-wave as $\rightarrow \bar{v} \left[\frac{\sigma}{2\pi r} + \frac{\sigma \Phi}{2\pi r} \right] \equiv \bar{c} \cdot \left[\bar{f}_n \right] + f_n$] which Stresses σ , continue to be , **Stationary** in Storage Photon and Movable in moving .

- 3... The Electromagnetic-wave in the **Bracket-axes-Plane** , and because of the Birefringence of the Electric and Magnetic field , Specify the **Fringe-Pattern** as the stationary $\left[\bar{f}_n \right]$ and as the Changing-Energy-Part $\left[\bar{f}_{\text{Stress}} \right]$ which is **the changing of Colors** in Fringe-Pattern.

- 4... Fringe-Pattern follows the **Shape of the Compound-Atom** and the How this is Stressed. Since **Electromagnetic-Waves travel** in direction **co Perpendicular** to their Sinusoidal Electric and Magnetic-Fields , so the subjected-Stresses which are comprised in their own Plane or Volume **Portray** the Electromagnetism-Space-Energy.

- 5... Since also Photon-Waves occupy the Duality Property , $\bar{v} \left[\frac{\sigma}{2\pi r} + \frac{\sigma \Phi}{2\pi r} \right] \equiv \bar{c} \cdot \left[\bar{f}_n \right] + f_n$] , then when Electron velocity $\dot{x} = 0$, *it happens the moment where Electron is quitting Orbit-1 and enters into Orbit-2* , where then Energy $E = U(x)$, **i.e.**

The Total Energy **E** of Common-cave is equal to the **Potential energy** $U(x)$ only , and The **Nucleus-Bracket-Hook** , is a **Void-Space** , as that of Hydrogen-caves .

- 6... Fringes-Configuration-System $\equiv$ [**Space - Part** $\equiv$ Principal - Strain-Fringe , as Figure] + + [**Energy-Part** $\equiv$ Principal-Stresses creating the Colors]

- 7... **Photoelastic materials** exhibit the Property of Birefringence ONLY on the Application of Stresses , and the magnitude of the Refractive-indices at each Point of the material is analogously - related - to the state of stress at Point , it is the Von Mises **Elastic Limit** for Principal stresses equation $\sigma_z = \frac{\sigma}{\sqrt{3}}$, while **for the case** of the **Atoms-Brackets-Plane-materials** $\rightarrow$ **Brackets a priori exhibit the** two-directions for indices ($n_x - n_y$) and Retardation $\delta = d(n_x - n_y) = 2d \cdot K_{\text{soc}}(\epsilon_x - \epsilon_y)$, $\rightarrow$ **Stresses** become from the **Resonance-frequency** which is created from the Nutation of the One-Electron in the Common-Orbit .

- 8... Since the Stiffness of a length CH is inverse analogous to CH length and the mass , m , is analogous to the CH length motion , then Stiffness dimension follows that of $\rightarrow$ mass dimension magnitude .

- 9... In Figure -46 , the **Deflection line AB** is the **Outer - Shape in AB Geometry** ,
the **Strain-Fringe** is the **Inner - Configuration of AB Space** ,
the **Stress-Fringe** is the **Inner-Perpendicular-to Strain-Fringe-Shape of AB Anti-Space** ,

The Perpendicular Shape exists because Principal stresses σ , are Perpendicular to Shear stresses τ_{12} which Shears create the Strain Fringe . Crags are Perpendicular to Shears or the Strains are Perpendicular to Stresses . Electromagnetic-Wave $\{\bar{c} \cdot \left[\bar{f}_n \right] + \bar{c} \cdot f_n\}$ is consisted of **Two Frequencies** because Velocity $c = w \cdot r = 2\pi f \cdot r = 2\pi \cdot f$ and because the difference of the Principal and Perpendicular stresses $\sigma_x - \sigma_y = \left[\frac{K \rightarrow \text{soc}}{d} \right] \cdot \left[\frac{N \cdot \lambda}{2\pi} = \frac{N \cdot c}{2\pi \cdot f} \right]$ is inverse

analogous to the frequency light and follows the direction of the **Two-Frequencies** which is the **Stress-Fringe**.

10..The **DEFLECTION-Line** AB of a carrier is For Stationary-Geometry $\Rightarrow$ **The Figure-Impress –SHAPE** .
The **STRAIN - Fringes** is $\Rightarrow$ The **Quantum- SPACE-Figures** , And The **STRESSES - Fringes** is $\Rightarrow$ The **Quantum ANTI-SPACE-Colour-Fringes**. The different Spectrum colors repeat themselves Periodically on Strains and All consist $\rightarrow$ **The Geometrical – SPACE - ENERGY - Monads** $\leftarrow$

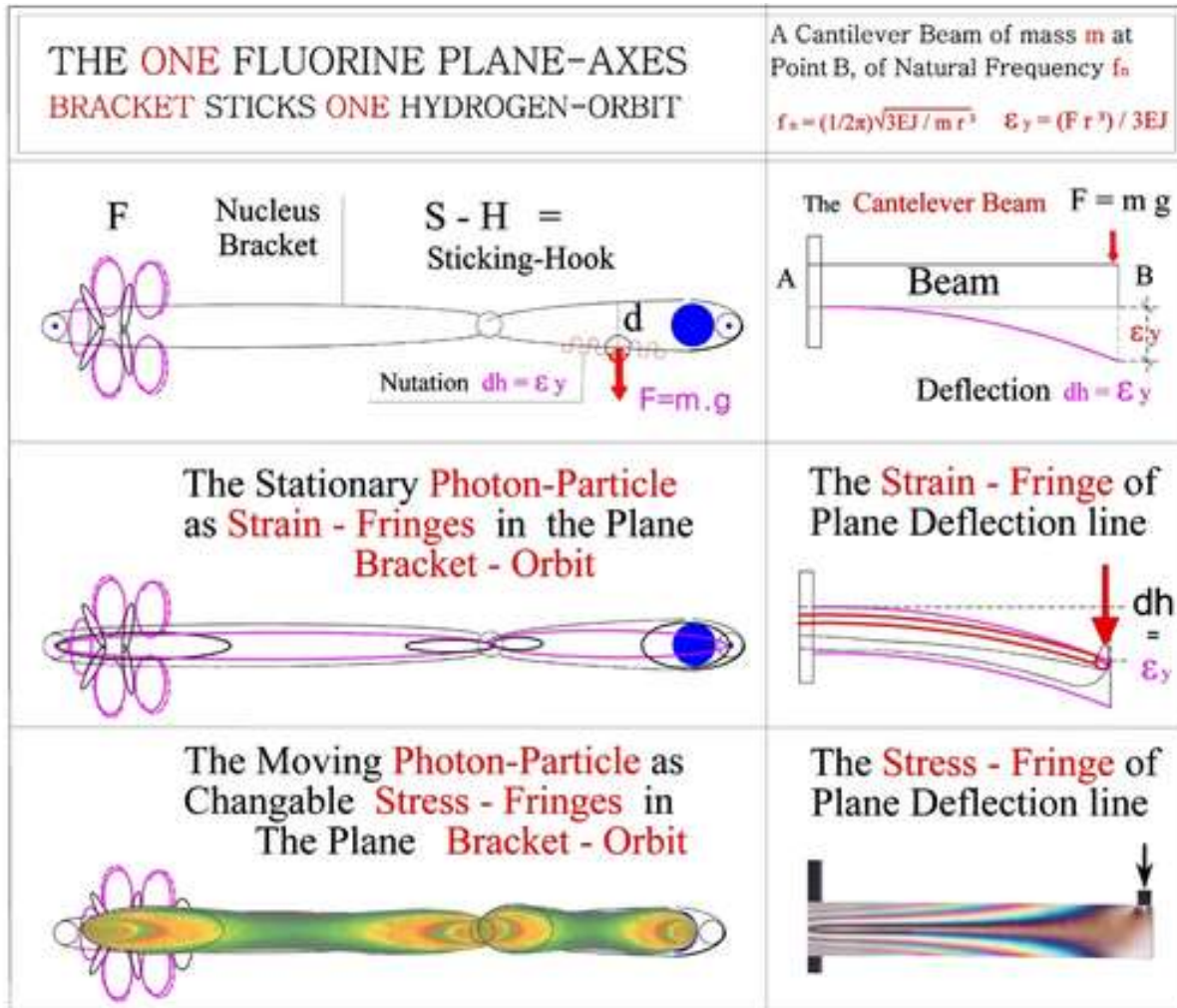


Figure – 46. The Electromagnetic-Wave $\{\bar{c} \cdot \bar{f}_n\} + \bar{c} \cdot f_n$ in the , Atoms-Bracket-axes-Plane .

The Process of Photoelastic Fringe Pattern :

The existence of an Electron in Hydrogen-cave r , of thickness d , creates the Magnetic field $\bar{B}_e = \left| \frac{2\pi \cdot m_e}{q_e} \right| f_e$, dependent on Electron mass m_e , charge q_e , and frequency f_e . **Gravity** acting on Electron-mass creates the force $F = m_e \cdot g$... (1) which in turn exhibits the Nutation of Electron which is Frequency $f_N = \frac{r^2 m_e g}{2\pi J_3 v} =$

$2,8398447 \cdot 10^{10}$ H ... (2) . Nutation -frequency f_N is $f_N = n \cdot f_1 = \frac{E}{h} = \frac{n \cdot v}{2\pi r} = \frac{n\sigma}{4\pi r} [1 + \sqrt{5}] = \left| \frac{\sigma \cdot \Phi}{2\pi \cdot r_n} \right|$ (3)

and is related to Principal-stresses σ , or $\sigma = \frac{2\pi \cdot r_n}{\Phi} f_1$ which is directly related to natural-frequency ,

And since $\sigma_x - \sigma_y = \left[\frac{K \rightarrow soc}{d} \right] \bar{N} = \left[\frac{K \rightarrow soc}{d} \right] \cdot \left[\frac{\delta}{2\pi} = \frac{N \cdot \lambda}{2\pi} \right] = \left[\frac{K \rightarrow soc}{d} \right] \cdot \left[\frac{N \cdot \lambda}{2\pi} = \frac{N \cdot c}{2\pi \cdot f} \right]$... (4) , **Fringes , Therefore ,**

The needed Pressure on Brackets – axes - Plane { for Photoelasticity-Fringe-Pattern }

is offered from The Electron – Nutation , f_N , meaning that Brackets of Electron - lack

Do Not Present Fringes . i.e. From (4) $\rightarrow f_N = n \cdot f_1 = \left[\frac{N \cdot c}{2\pi \cdot (\sigma_x - \sigma_y)} \right] \equiv \{ \bar{c} \cdot \bar{f}_n \} + \bar{c} \cdot f_n$ results that ,

The Electromagnetic-Wave as **Dual -Photon** $\rightarrow \{ \bar{c} \cdot \bar{f}_n \} + \bar{c} \cdot f_n$ $\leftarrow$ **On** – which the Stationary Part is The , **Geometry- Strain-Fringe - Pattern** $\leftarrow$ and The Changeable-Part $\rightarrow$ **are The movable and**

Changeable Colors – Stress - Fringe - Pattern ← in the Geometry-Strain-Fringe-Shape .

In (1) is shown the Stationary 2D-Space-Part which is *The-Strain-Fringe-Pattern* and is the **PARTICLE Photon** $\vec{c} \cdot \vec{f}_n$ ← or $\vec{c} \cdot \vec{f}_n = w r f_1 \equiv \sigma \Phi \cdot f_1$, i.e. the Geometry , *The Shape* of the Fringe-Pattern .

In (2) is shown the Changeable 2D -Energy-Part which is *The-Stress-Fringe-Pattern* and is the **WAVE Photon** → $\vec{c} \cdot \vec{f}_n$ ← or $\vec{c} \cdot \vec{f}_n = c \cdot c f_n \equiv c \cdot \sigma \Phi \cdot f_1$, i.e. the movable and of Changeable-Colors , *In the Shape* , of the Stationary-Fringe-Pattern.

The Generation of *Electromagnetic-Radiation is the in-monads frequency-equation* as $\sin \frac{w \cdot l}{c} = \sin \frac{2rw}{v} = 0$, and satisfied by $\frac{2rw}{v} = \pi, 2\pi, 3\pi, \dots, n\pi$, where *Each , n , represents a Normal-Mode-Vibration-in monads* , with the Natural frequency be determined from frequency-equation as , *their Natural frequency* →

$$f_n = \frac{n}{2 \cdot l} c = \frac{n}{2 \cdot l} \cdot \sqrt{\frac{T}{\rho}} = \frac{n}{2 \cdot l} \sqrt{\frac{\sigma}{\rho}} = \frac{n}{4r} \sqrt{\frac{\sigma}{\rho}} = \frac{n}{4r^3} \cdot \sqrt{\frac{(1+\sqrt{5})^2 \sigma^2}{4\pi^2 r^4}} = \left[n \frac{\sigma(1+\sqrt{5})}{\pi (2r)^3} \right] , \text{ which is the index for Resonances .}$$

THE EIGEN-VALUES ≡ RESONANCES [7] - Page 235.

From above implies that , *Vibration on a System taking place under the excitation of External-forces* , which *excitation is Oscillatory* , then the System is *Forced to vibrate at the excitation frequency* .

If the frequency of excitation coincides with one of *the Natural-frequencies* $f_{N=1}$ *of the System* S , then exists a condition of *Resonance* , i.e. Oscillatory-Excitation ,

$$f_E [S \equiv f_1, f_2, f_N, f_n = w^2] \leftarrow \text{and } f_E \equiv f_N .$$

For the Un-damped free-vibration , the System , S , will vibrate at the Natural-frequency . However , in the N-DOF , the System not only vibrates at a certain natural-frequency but also with a certain natural-displacement – configuration . Moreover , there are as many Natural-frequencies and associated natural configurations as the number of DOF of the system , the natural modes of vibrations .

The usual method of finding the Eigenvalues and Eigenvectors of an vibrating System is that of the roots of the Polynomial equations obtained by the Characteristic Determinant . The method of transformation of coordinates coupled with an Iteration-Procedure that results in all the Eigenvalues and Eigenvectors is as follows .

The **usual-equations** of motion for an **Un-damped N-DOF System** is as $M_T \cdot \ddot{x}(t) + Kx(t) = 0$ as in Page 55

6-Case-D – with Total-Harmonic mass M_T , and the Natural-Resonance-frequency is $f_H = \sqrt[4]{\frac{1}{4\pi^2 M_T \cdot (a_H)^3}}$,

for initial conditions $x(0) = x_0$ and $\dot{x}(0) = \dot{x}_0$, where $x(t)$ is the Displacement-Vector , M is the Inertia-matrix , and K , is the Stiffness-matrix and the general solution is of Eigenvalue equation $[-w^2 M + K] u \cdot e^{iwt} = 0$ where u , is the constant scalar displacement-vector and $w = 2\pi f$, the frequency of the System. The solution of the above equation determines the *Real or Complex numbers* , $\lambda_1, \lambda_2, \dots, \lambda_n = w_n^2$, the called *Eigenvalues* , which satisfy the *Characteristic equation* of $\det. K = [A - \lambda I] x = [A - w^2 \cdot I] x = 0$, where x , is the eigenvector associated with the eigenvalues $\lambda = w^2$, and the corresponding Non-zero vectors .

From **Iteration-Procedure** equation of motion $[-\lambda M + K] X = 0 \dots\dots\dots(1)$ where ,

$\lambda = w^2$. $m_i / k \equiv$ The Natural – frequency ,

$K = k_1 - k_i \equiv$ The Stiffness – Matrix ,

$M = m_1 - m_i \equiv$ The Mass – Matrix ,

$X = x_1 - x_i \equiv$ The Displacement – Matrix ,

which is converted to the Standard Eigenvalues from equation $[\ddot{A} - \lambda I] Y = 0$, or $[-\lambda M + K] X = 0 \dots\dots(2)$ where , $\ddot{A} \equiv$ An Square Symmetric-Matrix , $Y \equiv$ An New Displacement - Vector transformed from X .

Because Atoms-Bonding is modelled as N repeated Spring-mass sections , and since results to the One-mass longitudinal-vibration , then equation (2) applied on Fluorine-Figure 39 becomes .

Fluorine $C O_4 F$ is an 3-DOF System $(CO_3) - (O) - (F)$, with Mass-Matrix and Stiffnes-Matrix as ,

Carbon mass → $m_C = 1,9888594 \cdot 10^{-30}$ Kg → 6 Protons , 6 Electrons ,

Oxygen mass → $m_O = 2,6492848 \cdot 10^{-30}$ Kg → 8 Protons , 8 Electrons ,

Fluorine mass . → $m_F = 3,1458799 \cdot 10^{-30}$ Kg → 9 Protons , 9 Electrons ,

The Stiffness-Matrix becomes from the Nucleus-existing-Positions in Atoms (*Protons* , *Neutrons* , *Electrons*).

For $[\text{CO}_3 = \text{C} + \text{O}_3] \equiv k_{11} \rightarrow 6\text{P} + 6\text{N} + 6\text{E} = 18$, $24\text{P} + 24\text{N} + 24\text{E} = 72$ and $k_{11} = 90$ Stiffness-Positions

For $[\text{O}] \equiv k_{22} \rightarrow 8\text{P} + 8\text{N} + 8\text{E} = 24$, and For $[\text{F}] \equiv k_{33} \rightarrow 9\text{P} + 9\text{N} + 9\text{E} = 27$ Stiffness-Positions .

$k_{12} \rightarrow 90 + 24 = 114 = k_{21}$, $k_{13} \rightarrow 0 = k_{31}$, $k_{32} = 24 + 27 = 51 = k_{23}$, and equation of motion is ,

$$[-\lambda \text{ M} + \text{K}] \text{X} = \{-\lambda \cdot 10^{-30} \cdot \begin{bmatrix} 9,9367138 & - & 0,000000 \\ - & 2,6492848 & - \\ 0,000000 & - & 3,1458799 \end{bmatrix} + 3k \cdot 10^{-30} \cdot \begin{bmatrix} 30 & 38 & - \\ 38 & 8 & 17 \\ - & 17 & 9 \end{bmatrix}\} \cdot \begin{bmatrix} \text{X1} \\ \text{X2} \\ \text{X3} \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix} \dots (3)$$

The Eigenvalues of System (3) are found from the **Characteristic-Determinant** equated to Zero as ,

$$\text{DET} \rightarrow \begin{bmatrix} 30 - 3,3122379 \cdot 10^{-30} \lambda & -38 & 0,000000000 \\ - & 8 - 0,8830945 \cdot 10^{-30} \lambda & - \\ 0,000000000 & 17 & 9 - 1,0486266 \cdot 10^{-30} \end{bmatrix} = 0 \text{ , or ,}$$

$$\{30 - 3,3122379 \cdot 10^{-30} \lambda\} \cdot \begin{bmatrix} 8 - 0,8830945 \cdot 10^{-30} \lambda & 17,000000000 \\ 17,000000000 & 9 - 1,0486266 \cdot 10^{-30} \end{bmatrix} = 0 \text{ , or ,}$$

$$\{30 - 3,3122379 \cdot 10^{-30} \lambda\} \cdot [72 - 8,3890128 \cdot 10^{-30} \lambda - 7,947855 \cdot 10^{-30} \lambda + 0,9260369 \cdot 10^{-60} \lambda^2 - 289] = 0$$

$$\{30 - 3,3122379 \cdot 10^{-30} \lambda\} \cdot [-217 - 16,336867 \cdot 10^{-30} \lambda + 0,9260369 \cdot 10^{-60} \lambda^2] = [-6510 - 490,10601 \cdot 10^{-30} \lambda +$$

$$+ 27,781107 \cdot 10^{-60} \lambda^2] + [718,75562 \cdot 10^{-30} \lambda + 54,11159 \cdot 10^{-60} \lambda^2 - 3,0672545 \cdot 10^{-90} \lambda^3] =$$

$$- 3,0672545 \cdot 10^{-90} \lambda^3 + 81,892697 \cdot 10^{-60} \lambda^2 + 228,64961 \cdot 10^{-30} \lambda - 6510 = 0 \text{ , or}$$

$$3,0672545 \cdot 10^{-90} \lambda^3 - 81,892697 \cdot 10^{-60} \lambda^2 - 228,64961 \cdot 10^{-30} \lambda + 6510 = 0 \text{ , and solving(4)}$$

as an Quadratic equation because , $10^{-90} \lambda^3$, is an non-measurable magnitude then for λ , issues

$$\lambda = \frac{[-228,64961 \cdot 10^{-30} \pm \sqrt{52280,644 \cdot 10^{-60} + 2132485,58 \cdot 10^{-60}}]}{163,78539 \cdot 10^{-60}} = \frac{[-228,64961 \cdot 10^{-30} \pm 1478,0954 \cdot 10^{-30}]}{163,78539 \cdot 10^{-60}} =$$

$$\lambda_1 = 7,6285546 \cdot 10^{30} \text{ and } \lambda_2 = -10,420618 \cdot 10^{30}$$

$$\text{The Stiffness-Matrix } k = 3 \begin{bmatrix} 30 & 38 & - \\ 38 & 8 & 17 \\ - & 17 & 9 \end{bmatrix} = 30 \cdot \begin{bmatrix} 8 & 17 \\ 17 & 9 \end{bmatrix} - 38 \cdot \begin{bmatrix} 38 & 17 \\ - & 9 \end{bmatrix} = -6510 - 12\,996 = 19\,506$$

$$\text{The mass-Matrix } m = \begin{bmatrix} 9,9367138 & - & 0,000000 \\ - & 2,6492848 & - \\ 0,000000 & - & 3,1458799 \end{bmatrix} = 82,815867 \cdot 10^{-30} \text{ Kg}$$

The solution to the equation in terms of , $\lambda = w^2 \frac{m}{k}$, and of $w^2 = \lambda \frac{k}{m}$ or $w = \sqrt{\frac{\lambda k}{m}} = 2\pi \cdot f_R$ and $f_R = \frac{1}{2\pi} \sqrt{\frac{\lambda k}{m}}$

$$f_{1R} = \frac{1}{2\pi} \sqrt{\frac{\lambda_1 k}{m}} = 0,1591549 \cdot \sqrt{\frac{7,6285546 \cdot 10^{30} \cdot 19,506 \cdot 10^{-30}}{82,815867 \cdot 10^{-30}}} = 42,388496 = \mathbf{6,7463368 \cdot 10^{15} \text{ H}} \text{ , which is near}$$

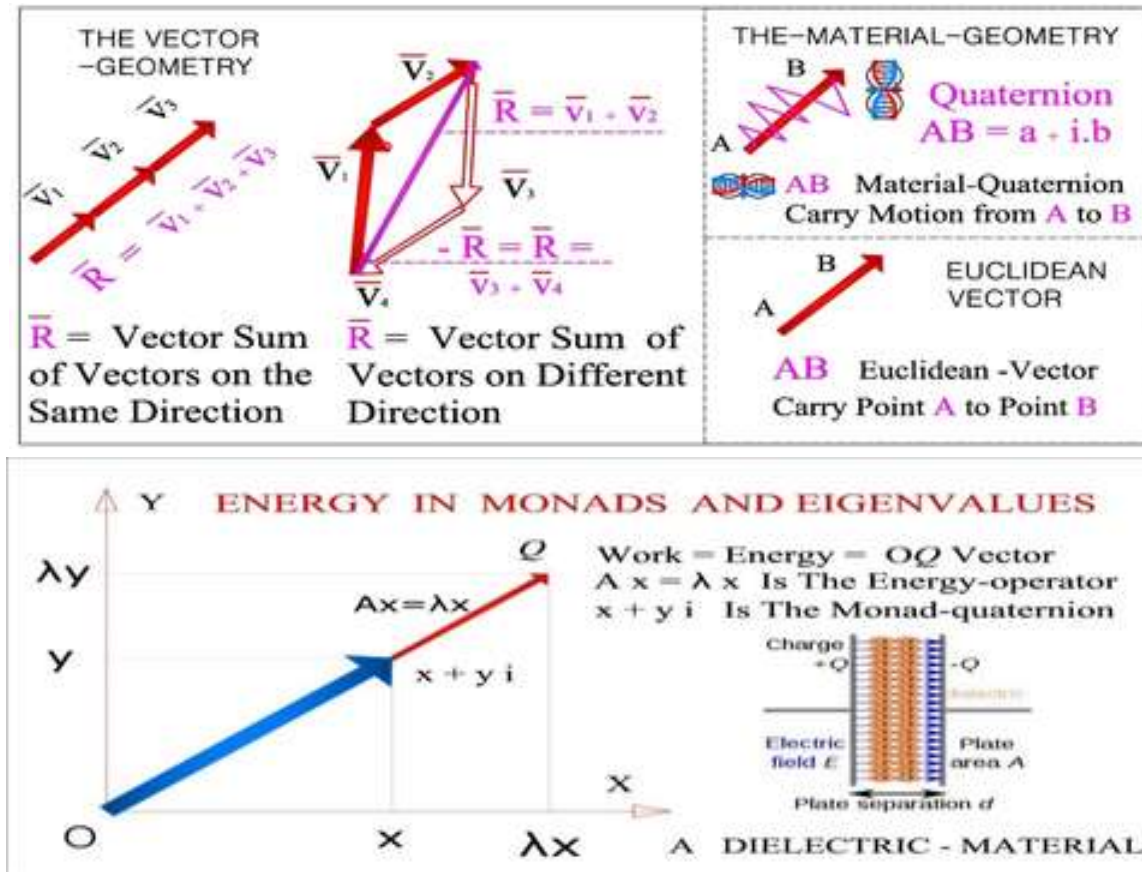
to the common k , constant energy $k = 4 \pi^2 m f_o^2 = \frac{1}{f_o^2 a^3}$ or , $f^4 = \frac{1}{4 \pi^2 m a^3}$ and Resonance-frequency $f_R =$

$$f_{2R} = \sqrt[4]{\frac{1}{4 \pi^2 m a_H^3}} = \sqrt[4]{\frac{1}{4 \pi^2 \cdot 1,680307 \cdot 10^{-31} (2,1127839 \cdot 10^{-11})^3}} = \sqrt[4]{15,87188 \cdot 10^{60}} = \mathbf{1,995984 \cdot 10^{15} \text{ H}} \text{ , Neutron P-106}$$

The Exact three-Roots of the third-degree equation follow the Sum of the roots regardless of degree N .

Remarks :

- 1..In any material System S , with any N-Net-Configuration , in all levels is formed a Stationary equation containing the , **M - Inertial-matrix of Configuration** , and the , **K - Stiffness - matrix**
- 2..The Characteristic matrix $K = [A - \lambda I]$ and its Characteristic Determinant , $\det. K = 0$ produces a Characteristic Polynomial with powers of , λ up to λ^n , and therefore when it set equal to zero has , **n** , roots the called eigenvalues , and factorized in the form of , $(\lambda - \lambda_1) \cdot (\lambda - \lambda_2) \dots (\lambda - \lambda_n) = 0$ and for $\lambda = 0$ then $\rightarrow \det. A = \lambda_1 \cdot \lambda_2 \dots \lambda_n = 0$ and for the Third-degree equation is $f(\lambda) = \lambda^3 - \lambda^2 (\lambda_1 + \lambda_2 + \lambda_3) + \lambda (\lambda_1 \cdot \lambda_2 + \lambda_1 \cdot \lambda_3 + \lambda_2 \cdot \lambda_3) + \lambda_1 \cdot \lambda_2 \cdot \lambda_3 \equiv 0$
- 3..The Operator associated with Energy is Euler's or Lagrangian and the Operator on the Wave-function Is The Laplacian or the Lagrangian equation determining the Stability of the moving Wave .



Systems with N-DOF , Degrees Of Freedom :

Figure – 47- 48 . The Eigenvalues λ , in Energy monads :

- Monad is Quaternion $[x + iy]$ and Energy The Vector $OQ = \{\lambda\} \cdot X$
- Energy is the Work produced in monads and equal to $W = 2L = \bar{B} \cdot \bar{w} = J \cdot w^2$
- The Configuration of a Stationary-System is expressed by the matrices $M \cdot \ddot{x}(t) + Kx(t) = 0$
- The Characteristic matrix $K = [A - \lambda I]$ gives the n , roots such that $\det. A = \lambda_1 \cdot \lambda_2 \dots \lambda_n = 0$
- Energy in Store $2\lambda = r = h/p \equiv [f_1, f_2, f_n \equiv n \text{ lobes}]$ follows the *Stationary-Wave -Nodes-Principle*.
- Dielectric-medium is an Electric-Insulator that is Polarized by an, *applied or internal*, Electric-field .
- Matrix A acts by stretching the vector X , *not changing its direction* , so X is an eigenvector of A . Reorientation of Spin creates a New Nutation - Period $f_N = n \frac{(1+\sqrt{5})\sigma}{4\pi r}$ and a New wavelength as $\lambda_N = \frac{2r}{n} = \frac{4\pi r c}{n\sigma(1+\sqrt{5})} = \frac{8r^2 c}{n\sigma B}$ following the relation $\lambda = c/f$, $f_N = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{n\sigma \cdot B}{8r^2}$

The Two-Vectors v_1, v_2 , in **E-Geometry** consist area $A = |v_1| \cdot |v_2|$ and Three Volume $V = |v_1| \cdot |v_2| \cdot |v_3|$,while for **Material-Geometry** $\bar{v}_1 + \bar{v}_2 = R\bar{v}_{1-2} = \text{Resultant } \sqrt{|\bar{v}_1|^2 + |\bar{v}_2|^2} \cdot [\bar{v}_{1-2}]$ and Volume $= |v_1| \cdot |v_2| \cdot |v_3| \equiv |R\bar{v}_{1-2}| \cdot |\bar{v}_3| \equiv |R\bar{v}_{1-2-3}| \equiv |R\bar{v}_{1-2+3}| \equiv$ The Vertices of the **Regular-Tetrahedron** ,of four triangular faces 123, R12,R23,R31. The Energy-method overcame the difficulties of the Vector-method , but in terms of Physical coordinates is limited to single-DOF Systems. The Virtual-work-method is a Powerful tool for Systems of higher DOF , however it is not entirely a scalar procedure in that Vector consideration of forces necessary in the determining the Virtual-work.

Lagrange's formulation is an entirely Scalar Procedure starting from the Scalar quantities of the Kinetic energy $T = T(q_1, q_2, q_N \dots q_1, q_2, q_3)$, Potential Energy $U(q_1, q_2, q_N)$, and **Work expressed in terms of Generalized-coordinates** as Lagrange- equation ,

$$\frac{d}{dt} \left(\frac{\partial T}{\partial \dot{q}_i} \right) - \frac{\partial T}{\partial q_i} + \frac{\partial U}{\partial q_i} = Q_i \dots \dots \dots (1) \quad \text{The left side of (1) when Summed for all the } q_i ,$$

is a statement of the Principle of conservation of Energy and is equivalent to $d(T+U) = 0$.

The right side of (1) results from dividing the Work Term in the dynamical relationship $dT = dW$ into the Work done by the Potential and non-Potential forces as is, $dT = dW_p + dW_{np}$, and thus Lagrange's equation (1) is the q_i component of The Energy equation $d(T+U) = \delta W_{np}$. The right side of this equation is as $\delta W = \sum Q_i \delta q_i = Q_1 \delta q_1 + Q_2 \delta q_2 + \dots$, where Q_i is the Generalized-force. Quantity Q_i can have Any-unit as, *Unit of forces*, *of Geometry*, *of Physical-coordinates* and everything that can be considered as Work from relation $Q_i \delta q_i$.

In mechanics, the eigenvalues of a System are found from the roots of the Polynomial equation obtained from the **Characteristic Determinant**. Each of the Roots, *or Eigenvalues*, is substituted, one at a time, into the equations of motion to determine the Mode-Shape, *or the Eigenvectors*, of the System.

The Geometry and The Physical Configuration - Structure of Systems .

- A.. The Point-Line-Plane-Volume : E-Geometry : (1) . (2) . . (3) . . (4) . . .
 B.. The Material-Point : M-Point : $[\oplus \cup \ominus]$, $|\ominus \leftrightarrow \oplus|$
 C.. The Forced-Material-Point : M-Geometry : $f_E [S \equiv f_{1=N}, f_2, f_3, f_n = w^2] \leftarrow f_E \equiv f_N$
 D.. The Forced-Nodes -Structure : Mechanics : $[-\lambda M + K] X = 0$ $[\bar{A} - \lambda I] Y = 0$
 E.. The Valence-Bond-Particles : Chemistry : $\mathbb{R} \mathbb{R}$, $\mathbb{R} \odot \mathbb{R}$, $\mathbb{R} \otimes \mathbb{R}$, $\mathbb{R} \otimes \mathbb{R}$, $\mathbb{R} \otimes \mathbb{R}$, $\mathbb{R} \otimes \mathbb{R}$

In Euclidean-Geometry are shown the different Stationary-Shapes that Points maybe formatted. The Points on Shapes are called *Vertices*.

In Material-Point are shown the two Stationary-Shapes that Material-Points maybe formatted. The Points on Shapes are called *Spaces*, $\oplus$, *Anti-spaces*, $\ominus$, or $(+)$, $(-)$ Charge.

In Material-Geometry are shown the different Stationary-Shapes, *The Strains*, that the Material-Points maybe formatted. The Points on Shapes are called *Spaces*, $\oplus$, *Anti-spaces*, $\ominus$, or $(+)$, $(-)$ charge and consist the System. **Material -Vector carries motion** $\equiv$ Energy from one edge A, to the other B, while in E-Geometry carries Point A to Point B. This happens because motion is carried in loops, Conductors. Conductors are of Quaternion-Type and Opposite, and consist the One Part of Dual-Photons.

In Mechanics are shown The modes of Non-stationary-Shapes in General-coordinates equal in number to degrees of freedom of the System, and by using Energy-Equation of motion is converted to the Standard - Eigenvalue-form $f_E [S \equiv f_{1=N}, f_2, f_3, f_n = w^2] \leftarrow$ where then $f_E \equiv f_N$. The Points on Shapes are characterized with the *Degrees of freedom*, which are, Loaded and or Unloaded.

In Chemistry are shown the different, Stationary or Non-stationary-Shapes of Elementary Particles, Atoms, Ions, Molecules, Crystals, etc. and Compounds, Placed with their Chemical-Bonds, that maybe formatted. The Points on mode-Shapes are in *each-State* the System of *Atoms-Ions-Molecules-etc.*, which are, Loaded or Unloaded. **All above Configuration-Structures are under a Common - Relationship That of Resonance . i.e.**

- a.. On a System, z , which is an Quaternion $z \equiv s + \bar{v} \nabla i$, **ACTING**, and another Quaternion $z' \equiv s' + \bar{v} \nabla i$ with Real and Imaginary Parts **OCCURS**, a *Relationship, a Resonance*, between these, and is described by their common **Natural - frequency** f_N , meanwhile motion in Response to **The Imaginary Parts**.
 b.. Since monads are of Quaternion and of Wave-nature-Pattern Resistance is the mass, i.e. it is a **Measure of any Reaction to motions** and is of, *Real* and of *Imaginary Part* as $R_z = R_s + R_{\bar{v}}$. If the Reaction to motions R_z causes losses from cycle to cycle Then is due to Damping. Damping is of great importance in limiting the Amplitude of oscillation at Resonance.

Reaction to motion, In Mechanics and Physics, is the mass or the Inertia, In-Electricity is

$$\text{Inductance in Electric circuit, In M-Point mass } m = \frac{2}{c^2} (wr)^3 = \frac{h.w}{2\pi.c^2} \equiv \frac{2E}{a_a} \equiv \left[\frac{\bar{B} \cdot \bar{w}}{\bar{B} \times \bar{w}} \right] . J$$

Since also monads are internally as *Storage-modes*, $f_n = w_n^2$, Therefore Systems are able, to *Store* and easily to *Transfer* Energy between any Two or more Storage - modes.

In Material-Point, M-Point - Resonance occurs on M-Point when Placed in a Uniform Magnetic Field. Its Energy $E = W = \left[\frac{4\pi r^2}{3} \right] . f_n = n \frac{(1+\sqrt{5}).\sigma r}{3} = 2L = \bar{B} \cdot \bar{w} = J.w^2$, is split into the, n , finite numbers of Energy-lobes dependent on The Angular-Momentum-Vector $\bar{B} \equiv \text{Spin}$. Reorientation of Spin creates a New Nutation-Period $f_N = n \frac{(1+\sqrt{5})\sigma r}{3}$ as in Fig-48, a New wavelength $\lambda_N = \frac{2r}{n}$, where $\lambda = 2r$.

Since frequency $f_N = n \frac{(1+\sqrt{5})\sigma \cdot r}{3} = \frac{\lambda_N}{c}$ then, $\lambda_N = \frac{8 \cdot r \cdot c}{n\sigma^2 \cdot (1+\sqrt{5})} = \frac{4 \cdot r \cdot c}{n\sigma^2 \Phi}$, which is the New wavelength.

If Material-Point is ticked with a field of another frequency then is unlikely to Transition **Only -When** acquire a Common frequency f_T . This common Transition-frequency is **the** → **M-Point -Resonance**.

In Mechanics, **Resonance** occurs in a Mechanical-System, under the **EXCITATION** of an Oscillatory System. If the frequency of excitation coincides with one of the Natural frequencies of the system, a condition of Resonance is encountered. Vibrating Systems are all subject to damping and this because Energy is dissipated by The resistances of motion.

In Physics, **Physical - Resonance** occurs in a Physical-System when another Vibrating-System or external forces **DRIVE** the System to oscillate with greater Amplitude at Specific frequencies called **Resonance-frequencies**.

In Medicine, **MRI-Medicine-Resonance** occurs between the Nucleus, of the Two-Hydrogen-atoms in water-molecules, consisted of a single Proton and when **excited by an Strong-Magnetic-field** Then is twisting its orientation so that aligned with the field. Proton all by itself may absorb and reemit 900 MHz Photons, but when it gets near other charges it gets twisted and distorted and its Resonance frequency shifting to 906 MHz. This means that MRI Machine maybe used to generate Spectra corresponding to the amount of Resonance at various frequencies and which in turn reveals details of the structure of molecules. Above Procedure can be used in Cells, where cells are cases of an Birefringent material and the Resonance-Passage happens as the Force, **EM-Radiation in Two directions, can travel in Cell** Through Cauchy-stress-Tensor where the two Conveyers $E \perp B \perp r \equiv \sigma_1 \perp \sigma_2 \perp \sigma_3$, can carry The Energy-Storage, r , in Cell, and change the Inner-Structure of Shell to another desirable Property. The **Cancer-Cells** follow The Lissajous-Eight-Shapes as the Vessels of Difference Phase $d_\phi = 90^\circ, 0^\circ, 45^\circ$ to Double the Number of Chromosomes. The Two-masses **C-C** is controlled from Transverse E-waves.

In Momentum-Paradox of light, **MP - Light-Resonance** occurs, when The Photon is An System S , as $\{ [S \equiv EM-R \equiv f_{1=N}, f_2, f_3, f_D, f_n]$ and $\lambda_N = \frac{8 \cdot r \cdot c}{n\sigma^2 \cdot (1+\sqrt{5})} = \frac{8 r^2 c}{n\sigma B}] = \frac{4 \cdot r \cdot c}{n\sigma^2 \Phi} \}$, and which is a moving Energy tank as EM-Radiation and, **DRIVE** the System of the Dielectric-Medium $[S_D \equiv f_D]$ To oscillate with a common amplitude, The Dielectric-Polarization frequency f_D , with a → New-mass Density-Wave, becoming from The Reaction to the New Reorientation of Spin. It was Proved that when Spin = $\vec{B}$ vector changes direction, Then frequency is between them $[f_1, \dots, f_n = w^2]$ and becomes another Particle. [68].

A light-Pulse, Driven forward, in a sort of Optoeleastic shock-wave, $E.M-R \equiv f_{1=N}, f_2, f_3, f_R, \dots, f_n$, Electromagnetic-Radiation, then Photon's momentum is,

$$\vec{B} = \frac{r\sigma \cdot (1+\sqrt{5})}{n} = \left[\frac{\sigma \cdot (1+\sqrt{5})}{2} \right] \frac{2r}{n} = \sigma \Phi \cdot \left| \frac{2r}{n} \right| = v_R \cdot \frac{2r}{n} = \frac{2rc}{n \cdot N_R} \text{ i.e.}$$

Photon momentum follows the Inverse-dependence of the Radiation-Pressure on the Refractive-Index.

From equation $f = \frac{\sigma \cdot (1+\sqrt{5})}{4\pi r} = \frac{n \cdot \pi \sigma \cdot \vec{B}}{8 r^2} = \frac{n \cdot \pi \sigma \cdot 2rc}{8 r^2 \cdot n \cdot N_R} = \frac{\sigma \cdot \pi c}{4r \cdot N_R}$ arises that, Energy Propagating with a light - Pulse in a Medium is carried by the field, so Optical-force-field of the light-Pulse would Drive forward an atomic mass density-wave inversely dependent on the Refractive Index $N_R = \frac{c}{v}$.

In mechanics – Physics, Change, is that of Space, ds , and it is The velocity Vector $\vec{v}$, that of change of velocity Vector and it is acceleration $d\vec{v}$, That of change of the Reaction to the Velocity and Direction of the motion and it is mass m . All Units = monads have their Place in Spaces.

In Mechanics, **Resonance** occurs in a Mechanical-System, under the **EXCITATION** of an Oscillatory-System of the three constants, mass m , x = The displacement, dx/dt = The velocity and → d^2x/dt^2 = acceleration of monad, The Second-order differential equation excited by a Harmonic external force $F_t \cdot \sin wt$ is,

$$m \frac{d^2x}{dt^2} + c \frac{dx}{dt} + k \cdot x = F_t \sin wt \quad \text{and,}$$

corresponds Physically to the free damped vibration, for m, c, k constants, with general solution given by the equation $x = A \cdot e^{s_1 \cdot t} + B \cdot e^{s_2 \cdot t} + X \sin(wt - \phi) \dots (1)$. where also $x = ds$

The analogous in an RLC circuit, oscillating at its natural frequency is as, $L \frac{d^2q}{dt^2} + R \frac{dq}{dt} + \frac{1}{C} q = E_t \sin wt$,

where the , L , R , C , constants define The , m , c , k , constants .

In Electromagnetism , *Change* , say a Space- monad is $\rightarrow$ a Resonance *which can occur in the RLC circuit* , where **Resistance R** , is the change in current amount *it is the converter of current* , **Inductance L** , is like mass or Inertia in Mechanical Systems which store the Magnetic-Energy and , **Capacitance C** , concentrates ($\pm$) charge which store the Electric-Energy in much the same way that springs store mechanical Energy *inverse spring constant* , is the analogous . The differential equation excited by a Harmonic Electromotive force $E_t \sin wt$, in an RLC circuit , oscillating at its Natural frequency in Voltages $V = \frac{E}{q} = \frac{q}{C} = L \frac{di}{dt} = Ri$, is

$$L \frac{d^2q}{dt^2} + R \frac{dq}{dt} + \frac{1}{C} q = E_t \sin wt , \quad \text{where current } i = \frac{dq}{dt} ,$$

corresponds Physically to The free damped vibration , where Charge q = is the Physical Property of matter that causes it to experience a force which can be Positive or Negative , dq / dt = The least quantized amount of charge and d^2q / dt^2 = The Space distribution of charge , and L , R , C Inductance , Resistance , Elastance constants , with general solution given by the equation ,

$$q = A . e^{s1.t} + B . e^{s2.t} + X \sin(wt-\phi) \dots\dots(2) \quad \text{where also } q = C (U_1 - U_2)$$

Equations (1) and (2) give The Analogic relation of the Classical mechanics [Space Position , x] and the Electromagnetism [The Quanta of Energy, q] of Storing and Removing of Energy in Energy-Space cosmos .

In E-Geometry-Mechanics , *Change* , say monad NN is an cycloidal Resonance $NN = \lambda/2 = 2\pi r = s^2 = [2\pi/w]^2 = 4\pi\sqrt{r}/c$, clashed with velocity vector $\bar{v} = \bar{c}$, and causing velocity components $V(x)$, $V(y)$ *which move forth and back , up and down* , and thus forced to Vibrate at a Specific Fundamental frequency .[49]

Motion is as The Charge in Physics , and occurs from the Cross – Product velocity components $|\bar{v}x|$, $|\bar{v}y|$ where $|\bar{v}|^2 = |\bar{v}x| x |\bar{v}y|$ validating in clashed inherent vibration Particles .

Potential Energy is as The Voltage and occurs from Cross-Product velocity v_x , v_y of couple components $v_x(r)$, - $v_x(r)$, on radius of curvature , $\rho = 4r.\cos\phi$, and from the Transverse Centrifugal velocity Couple $v_y(r)$, - $v_y(r)$, The Magnetic Voltage .

Since $\rho = XX' = 4r.\cos\phi$ and is varying on Cycloid - Evolute , *which is the Space Anti-Space equilibrium* , This creates oscillation in $[v_x(r) \rightarrow (XX')]$ Plane and Thus Producing Electric field . The same also for Transverse varying YY' creating Magnetic field in $[v_y(r) \rightarrow (YY')]$ Plane . Oscillation is thus Produced from the varying Space Positions , XX' , YY' , *forth and back –Up and Down* , because of the Geometry - Mechanics relation . **Spin** is the Resultant of Plane System of $\bar{S}_x$, $\bar{S}_y$, Vectors into v_x , v_y axis which follows the Cross-Product , and composed to vector $\bar{S}$ acting on breakage NN axis as Torque and because lever arms XX' , YY' are varying Resultant Momentum execute an Outer , Whirling motion Producing the Outer Oscillating motion of breakage.

Following Newton`s 1st and 3rd law for Spin at Nods N , N where Spin is Swept , monad $= \lambda/2$ is Push forward as velocity vector following the same In-cycle by forming the Outward Electromagnetic field . In Figures , Space $s^2 = (wr)^2 = ds$ is The tiny Energy-Resonance between EP = NN nodes so Changes to Motion Correspond to both , Classical mechanics and Electromagnetism equations .

The Changeable *Radius of Curvature* , formed between Cycloid and Anti-cycloid is $XX' = \rho = 4r.\cos\phi$, which depends on angle ϕ , *is following a cosine`s curve* , and it is at N,N Points , where for $\phi = 90^\circ$, then $\rightarrow \rho = 0$ and for the extrema case at $\phi = 270^\circ$, then $\rightarrow \rho = 2\pi.r$, and simultaneously $\rho = 0$. This changeable , *Radius of Curvature* , creates the varying cycloidal Electromagnetic Wave of monads which is Regenerated between N , N nods , as a kind of Geometrical variation Position . [70] The Changeable *Tangential Velocity* $\bar{v}_x(\tau) = c.\sin\phi$ depends on angle ϕ , *following a sinus curve* , it is at N , N Points , where $\phi = 90^\circ$ and $\phi = 270^\circ$, $v_x(\tau) = c$ and at middle Points O , O` , where $\phi = 0^\circ$, $\rightarrow v_x(\tau) = 0$. It is continually equilibrium with the opposite velocity $-v_x(\tau)$.

The Changeable , *Tangential Velocity* $\bar{v}_x(r)$, creates *Spin vector* $\bar{S} = 2rc . \sin 2\phi = 4rc.\sin\phi.\cos\phi$, depending on angle ϕ , *following The sinus curve* 2ϕ , and instantly at N , N Points , *where* $\phi = 90^\circ$ *and* $\phi = 270^\circ$, which is the extrema case $\rightarrow \bar{S} = 2\pi.r.c$, and after this immediately becomes zero until angle $\phi = 2\pi/5$ accepting The maximum value $\rightarrow \bar{S} = 2r.c$. At middle Points O , O` , where $\phi = 0^\circ$, then Spin $\bar{S} = 0$ even if $\rho = 4r$.

Since **Spin = Torque** = $[\bar{S}_x] \times [\bar{S}_y] = v_x(\tau).\rho.\sin\phi$ = The Angular equivalence of Force=*Torque* in NN axis of monad { NN = *a moving or not frame with magnitude = Scalar = |S| , and direction That of axis of Vector $\bar{S}$* } , and which force **never vanishes** , Therefore is conserved .

By this vanishing velocity, Spin is Swept away from monad as a kind of, *General Clearance*, for the New Regenerated Electromagnetic field $E \perp P$ by The centrifugal velocity Vectors $\bar{V}_x(r), \bar{V}_y(r)$. Meanwhile Total Torque $|\bar{S}| = 2\pi r.c$, exists in NN axis, **so monad NN would still be moving**, This per Newton's first law of motion, and This is according to conservation of, *Total Impulse*, and Rotating due to conservation of, *Linear and angular Momentum*. The compound **Centrifugal Force** due to the Two $V_x(\tau), -V_x(\tau), V_y(\tau), -V_y(\tau)$ is a Centripetal force making monad to move in a circle or a Helix as equation $C - F = mv_xw = -(wr)^2.v_xH = -(wr)^3.xH$. According to math theory of Elasticity, the Total Work on free edges where there is no Shear becomes from Principal-Stresses only and it is $W = \frac{\sigma^2}{2E} + \frac{\tau^2}{2G}$ and The analogous Energy in monads $W = \frac{1}{2}[\epsilon E^2 + \mu H^2]$ spread as the **First Harmonic** and equal to Spin $\bar{S} = 2\pi r.c$. Planck's Energy $E = h.f = (h/\lambda).c$ is equal to the Isochromatic Pattern **Fringe-order** in monad. **When the difference of Principal Stresses is** $\rightarrow \sigma_1 - \sigma_2 = (a/d).N = (a/d).n. f_1 = (8\pi r^2/3).n. f_1 \leftarrow$

And the Summation of Their Isochromatic Quantized Fringe-order is,

$$E = \bar{S} = 2\pi r.c = \left[\frac{8\pi r^2 f_1}{3} \right] \cdot \left[\frac{n(n+1)}{2} \right] = \left[\frac{4\pi r^2 f_1}{3} \right] n.(n+1) \text{ and In the same cave } (wr)^2, \text{ Then}$$

When Stress $(\sigma_1 - \sigma_2)$ go up Then, **n = The fringe-order defining Energy** goes up also, and the **colors-cycle** through a more or less Repeating Pattern and the Intensity of The colors is diminishing.

For $n = 1$, it is the *First Harmonic*, $E = 2\pi r.c = \left[\frac{4\pi r^2}{3} \right] . f_1 . [n = 1]$, and for $n = 2$. This is The Second **Isochromatic fringe** Quantized order, **n**, as **Threes** and, $E = \left[\frac{4\pi r^2}{3} \right] . f_1 . [2] \rightarrow \phi$, Energy – Bunched by the frequencies variation $f_2 = 2 f_1$. This is the way of Energy-Storing in Caves, or tumors in Vessels.

11-j...The Physical Notion of Anti-Quadrature and Quantization.

A.. THE SQUARING OF THE CIRCLE In Geometry and Mechanics . [45- 46 – 49- 63]

The Squaring of a circle is Not only the equality of the Circle-area to an Equal Square-area, BUT the deeper consideration of **Energy-Genesis** in the multi-degrees of freedom Systems. It was Prior Prooved That $\rightarrow$ **The**

Diameter D, of a circle in **STPL-Three-Poles-Squares-Rotational-System** is A Conductor $\overrightarrow{AK_A} = \mathbf{Q}_{\pm} = \left| \frac{c.\bar{S}}{r^2} \right| = I_E$ = The-Electric-Wave-Intensity, And, $\mathbf{r} = \overrightarrow{A \uparrow K_A} \equiv \mathbf{I}_M$, The-Magnetic-Wave-Intensity and **Vectors-Square** $[\overrightarrow{AK_A}] \times [\overrightarrow{A \uparrow K_A}] \equiv [\mathbf{Q}_x \mathbf{Q}_y] = \mathbf{k}_x \mathbf{k}_y$ = The **Energy-Square** $\equiv \mathbf{CM} \times \mathbf{CM} = \mathbf{CMNH}$ on circle (E, EA) and in Space **Energy-Volume** $\equiv [\overrightarrow{AK_A}] \times [\overrightarrow{A \uparrow K_A}] \times [D] = \mathbf{CMNH} \times [\text{Energy-Quantum } \overrightarrow{Q} \rightleftharpoons \equiv |\bar{e}|] = \mathbf{CMNH} \times \bar{Q}_{\rightleftharpoons} \dots (ev)$

In Present, **Electromagnetic-Wave** is An **Physical Propagating Quantum-Energy-Anti-Quadrature**, i.e. **The Conversion of The-Moving-Energy- { The Initial Quantum-Cube CB x CO x $[\overrightarrow{Q} \rightleftharpoons]$ } To, The Moving Energy- { Quantum - Prism CB x CO x $[\overrightarrow{D} \rightleftharpoons]$ } or Square Prism $\equiv$ The-Pivot To $[\overrightarrow{AK_A} \rightleftharpoons]$ Tetrahedron, To, The-Moving-Energy- {Quantum-Sphere $\equiv |\mathbf{Q}_x \cdot \mathbf{Q}_y| \cdot |\mathbf{AK_A}| \equiv \pi . \bar{E}_E \times \bar{E}_M [\rightleftharpoons]$ }, To The Equivalent-Energy **Double-Sphere**, $\{\bar{E}_E = \leftrightarrow\} \times \{\bar{E}_M = \uparrow\} \times |\lambda|$ To, An-Movable -Equal Energy-Sphere Cone $\equiv \mathbb{C} k.\pi.r^3$.**

The Property, of Resemblance Ratio to be equal to 2 is, **as the frequencies in an Stationary-Wave** is an Square transferred simultaneously by the equality of their Two-Areas, **when Square is equal to the circle**, where that Square is twice of the inscribed. This Property becomes from the linear expansion in the Three Poles.

In Fig-49(2), Square COAB is **Expanding on CA, OB axis** because angle $\angle OCA = 45^\circ$, i.e. Point A is carried on CA, OB Axis, from Point A to Point A_e and from Point B to B_e on (O, OB_e) Extreme-circle. Simultaneously Square CBAO is **Rotating on PA Axis** through Pole P, from POA to PHN on Common Point A_e , of lever Arm PA_e and becomes the CMNH Square on STPSR System. It is Proved that this motion of the Diagonal-Nibs forms the Common-Extreme-Square equal to the circle (E, EC).

In – Fig-49- (1),(2),(3) - The Steps for Squaring any circle [O, OA] or (E, EA = EC = EO), on diameter CA = OB, through The Expanding of the Inscribed circle [O, OG_e] $\rightarrow$ To the circle [O, OA] and To the circumscribed [O, OM], Through the Four Polars, O, A, C, P, From Procedure method,

In (1) The Expanding Inscribed circle $O, OG_e \rightarrow$ To circle O, OA and To circumscribed O, OM.

In (2) The Inscribed Square CBAO becomes by Rotation the Square CMNH and circumscribed CAC'P.

In (3) The Inscribed Square CBAO and its Idol CB'PO, which Rotates through The Pole C, i.e.

The Expanding Square CBAO, through Poles, O, C, . Up to OB_e circle, and Rotation through Pole P of, PA, PN chords. The Extrema **Common-Edge-Point** A_e of circle O, $OB_e = OA_e$ Rotates To A_e ,

PA , PN **Common Points** And formes The **Extrema-Square** $CMNH = NH^2 = \pi.EA^2$.

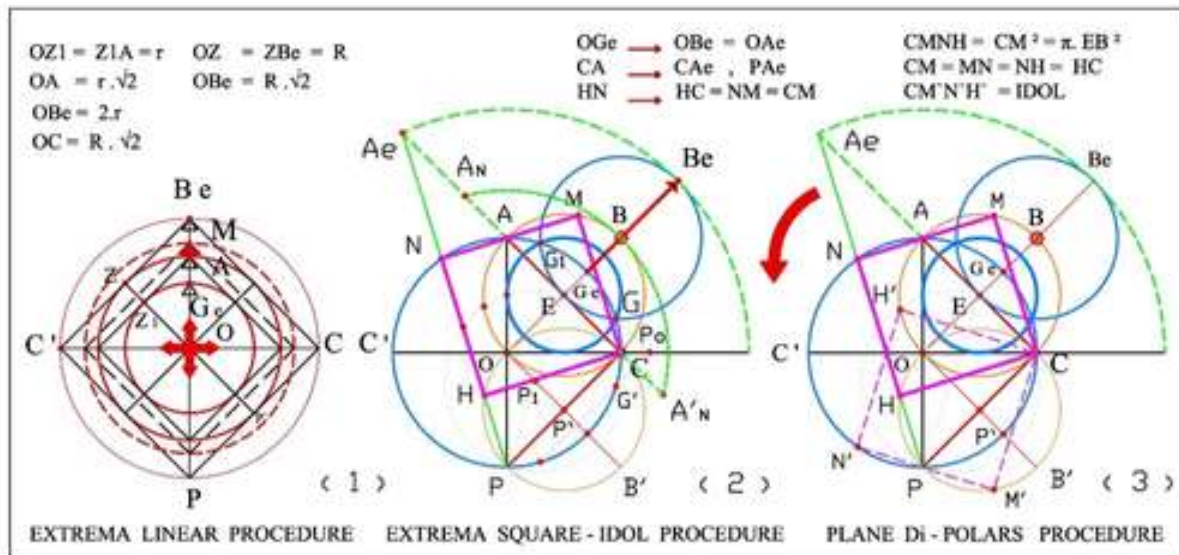


Figure – 49. The Three-Poles-Procedure-method of Squaring Any circle :

The Plane Procedure method :

It is consisted of Two Equal and Perpendicular Vectors CA, CP , **The Mechanism**, where $CA = CP$ and $CA \perp CP$, such, That the Work Produced is Zero and this because each area is zero, with the Three conjugate Poles A, C, P related to central O , with the Three Pole-lines CA, CP, AP And the Three Perpendicular Anti -Pole-lines $OB, OB', C'C$, and is thus **Converting The Rectilinear motion in (1) of the Mechanism, To The Four - Polar Expanding And Rotational motion in (2), (3)**. Simultaneously Square $CB^2 \rightarrow CM^2 \rightarrow CP^2$.

The formulated Five Conjugate circles with diameters $\rightarrow CA = OB, CP = OB', EB_e = OB, PC = OB', P_0G_1 = P_0G'_1 = CA$ and also The circumscribed circle on them $\leftarrow$ define

A System of infinite Changable - Squares from $\rightarrow$ the Inscribed $CBAO$ To $\rightarrow CMNH$ which is equal to the circle, and To $\rightarrow$ The Circumscribed $CAC'P$, Through **The Four - Poles of Rotation**. The Common Points, G, G_1 , of the Three Squares on, CA, CP Vectors, Define Their Limiting-Points on CA Vector-axis.

The Geometrical construction :

- Let E be the center, and CA is the diameter of Any circle ($E, EA = EC$).
- Draw $CP = CA$ Perpendicular at Point C and also The equal diameter circle ($P', P'C = P'O$).
- From mid-Point O of Hypotynuse AP as center, Draw the circle ($O, OA = OP = OC$) and Complete Squares, $OCBA, OCB'P$.
On Perpendicular diameters OB, OB' and from Points B, B' draw the circles, ($B, BE = Be$), ($B', B'P'$) intersecting (O, OA) = (O, OP) circle at double Points $[G, G_1], [G', G'_1]$ respectively, and OB, OB' Produced at Points $Be, B'e$, respectively.
- Draw on the Symmetrical to OC axis, lines GG_1 and GG'_1 intersecting OC axis at Point P_0 .
- Draw the Edge circle (O, OB_e) intersecting CA Produced at Point Ae , and draw PA_e line intersecting The circles, (O, OA), ($P', P'P$) at Points $N - H$, respectively.
- Draw line NA produced intersecting The circle (E, EA) at Point M and draw Segments CM, CH and complete Quatrilateral $CMNH$, calling it the *Space = The Circle-System*.
Draw line CM' and line $M'P$ produced intersecting circle (O, OA) at Point N' and line AN' intersecting circle (E, EA) at Point H' , and complete Quatrilateral $CM'N'H'$, calling it *The Anti - Space = The-Idol = Anti - System*. P_1
- Draw the circle (P_1, P_1E) of diameter PE intersecting OA at Point I_g , and (E, EA) circle at Point I_b

- Show That Quadrilaterals $CMNH, CM'N'H'$ are Squares.
- Show That it is an Extrema Mechanism, on Four Poles where, **The Two-dimensional Space (The Plane) is Quantized to a System of infinite Squares** $\rightarrow CBAO \rightarrow CMNH \rightarrow CAC'P$, and to $CMNH$ Square of side $CM = HN$, where holds $CM^2 = CH^2 = \pi.EA^2 = \pi.EO^2$.
- Show That, in circle ($E, EA = EC = EO = EB$) The **Inscribed Square $CBAO$** , **The Square $CMNH$** which is equal to the circle, and **the Circumscribed Square $CAC'P$** , Obey, **Rotation of Squares law** through Pole P , **Translation of circle** (E, EO) on OB Diagonal, and **Expansion** in CA, OB Segments.
- Show The equivalence of Space-Energy-Systems, Constant-Circle (E, EO) and the Changeable Squares

CMNH , Considering The constant **Circle - Area** as a Particle having mass m_c of **Constant-frequency**, and the Rotating **Changeable-Squares** , having masses m_s relative to their Areas , of the System as the other Infinite-Particles with **different -Areas $\equiv$ frequencies** , and Anti-System as the Equilibrium to the Prior – System . The circle-moment of Inertia $J_c \equiv \frac{\pi[OA]^4}{4} \equiv \pi(OA)^2 \cdot \frac{[OA]^2}{4}$ and of Square $J_s \equiv \frac{[NH]^4}{12}$ i.e.
 1... The System of a [constant-circle and the Changeable-Squares] **equilibrium** the Anti-System through $\pm S$.
 2... The System of , Circle of frequency. f_1 , and of the n-Squares of frequencies $f_N = n.f_s = \left| \frac{\sigma \cdot \Phi}{2\pi \cdot r_s} \right|$, **Resonate**
 Through Unit-Energy System of Unit-Areas $a^3 \cdot f_n^2 = 1$, frequencies $f_N = \left| \frac{\sigma \cdot \Phi}{2\pi \cdot r_n} \right|$, where $\sigma=1$ and of the equal Resemblance Ratio $= \frac{[OA]^2}{[OG_e]^2} = 2$, in Stationary-Wave of frequency f_N [$S \equiv f_1, f_2, f_N, f_n = w^2$] .

THE STEPS ,for Squaring the circle (E, EA = EC) on Diameter CA Through Plane Procedure Mechanism

- 1.. Draw on Any Orthogonal - System $OA \perp OC$, The circle (O , $OA = OC$) such that intersects the System at Points , P , C ` , respectively .
- 2.. Draw (E , $EA = EC$) circle on CA Hypotynouse , intersecting OE line at Point B , and from Point B draw the circle (B , $BE = BB_e$) and draw on CP Hypotynouse circle (P ` , $P'C = P'P$)
- 3.. Draw circle (O , OB_e) intersecting CA line Produced at Points , Point A_e , and Draw $A_e P$ intersecting (O , OA) circle at Point N , and (P ` , $P'P$) Conjugate - circle at Point H .
- 4.. Draw NA Produced at Point M on (E , EA) circle , and join The chorde MC on circle .
- 5.. Square CMNH is equal to The circle (E , EA) and issues $\rightarrow \pi \cdot CE^2 = CM \cdot CH \leftarrow$
 The Initial relation Position $CE^2 = EB \cdot EO = EO^2 = \frac{(CA)^2}{4}$ becomes $\rightarrow \frac{(CN)^2}{4} = \pi \cdot \frac{(CA)^2}{4} \leftarrow$
 for all Squares $C M_z N_z H_z$ on circles of Expanding radius OG_e To OB , To OG_e and To OZ .

The Question is The **Where** is seen The Quadrature and **WHY** is done so ? ?

The Answer is , At the Common-Limit - Point A_e of the Expansion of Square , CBAO on Diagonal creation axis OB , CA , and of the simultaneous Rotation of Vectors , $\overline{POA}$, $\overline{PHN}$, from Pole P .

The Special-Reason is found In-Mechanics ,where The-Vectors $\overline{PA}$, $\overline{PN}$ Carry The Nibs of Energy-Squares Resultants $\overline{CA}$, $\overline{CN}$, From Angular-Momentum-Vector- $\overline{B}$ at CBAO , TO The Angular-Velocity-Vector $\overline{w}$, of Total Energy-System as equation , $2L = \overline{B} \cdot \overline{w} = B \cdot 2\pi f = 2\pi \cdot \left[\frac{B^2}{\pi^2 r^4} \right] = \left[\frac{2 \cdot B^2}{\pi r^4} \right] \equiv h \cdot f_R$, **Where** from Euler Lagrange Inertia-Ellipsis , **The-Polar-Paths are Parallel circles** . [69] Page 54 , ...Markos 27 / 12 / 2017

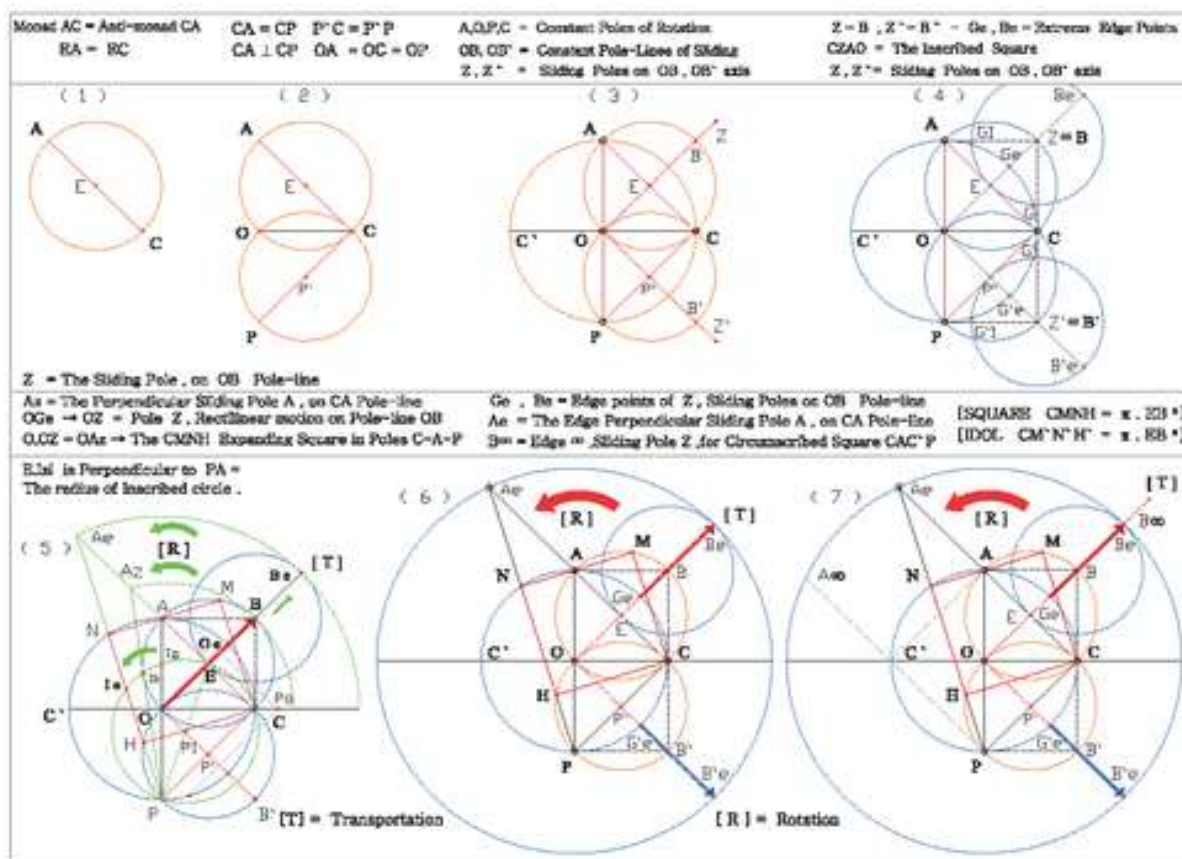


Figure – 50. The Steps for Squaring Any circle of Diameter AC .

Analysis :

- In F-50-(1), Radius $EA = EC$ and the unique circle (E, EA) of Segment AC , where AC, CA is The monad and the Anti-monad respectively.
- In F-50-(2), Since circles $(E, EA), (P', P'P)$ are Symmetrical to OC axis (line), Then are equal (*conjugate*) and since they are Perpendicular so, $\rightarrow$ No work is executed for any motion $\leftarrow$.
- In F-50-(3) Points A, C, P and O are the constant **Poles** of Rotation, and $OB, OB', OC - CA, CP, AP$ the Six, **Pole** and **Anti - Pole**, lines, of sliding Points Z, Z' , and A_Z, A'_Z , while CA, CP are the constant Pole - lines $\{PA, PA_e, PA_Z, PC'\}$, of Rotation through Pole P .
- In F-50-(3-4) Circles $(E, EO), (P', P'O)$ on diameters OB, OB' follow, My Theorem of the Three circles on Any Diameters on a circle, where the Pair of Points G, G_1 and G', G'_1 consist a Fix and Constant System of lines GG_1 and $G'G'_1$. When Points Z, Z' coincide with the Fix Points B, B' and thus forming the inscribed Square $CBAO$ or $CZAO$, (This is because Point Z is at Point A). Simultaneously PA Pole-line Rotates through Pole P , where Edge Points G_e, B_e are for the sliding Poles while Pole P is for Rotation on this opposite Rectilinear-Rotating System.
- In F-50-(5) When Points $Z \equiv B, Z' \equiv B'$ on lines OB, OB' , The Points A_Z, A'_Z , are The-Sliding-Points on AC , while CA, CP , are The constant Pole-lines $\{PA, PA_Z, PA_e, PC'\}$, of Rotation through Pole P . Sliding Points Z, Z', A_Z, A'_Z , are forming Squares $CMNH, CM'N'H'$, and this as in Proof $[A-B]$ below where PN, AN' are the Pole-lines Rotating through Poles P, A , and diamesus HM Passes through O . The circles $(E, EO), (P', P'O)$ on diameters OB, OB' , blue color, follow also,
- Markos - Theorem of The Diameters on a circle, and which follows .**
- In F-50-(6) Sliding Poles Z, Z' being at Edge Point $G_e \equiv Z$ formulates $CBAO$ Inscribed Square, at Edge Point $B_e, B_e \equiv Z$ formulates $CMNH$ equal square to that of circle and, at Edge Point B_∞ , formulates $CAC'P$ Square, which is the Circumscribed - Square.
- In F-50-(7) are holding $\rightarrow CBAO$ the Inscribed - Square, $CMNH$, The equal to the $(E, EO = P'O)$ Circle - Square, and $CAC'P$ the Circumscribed - Square.

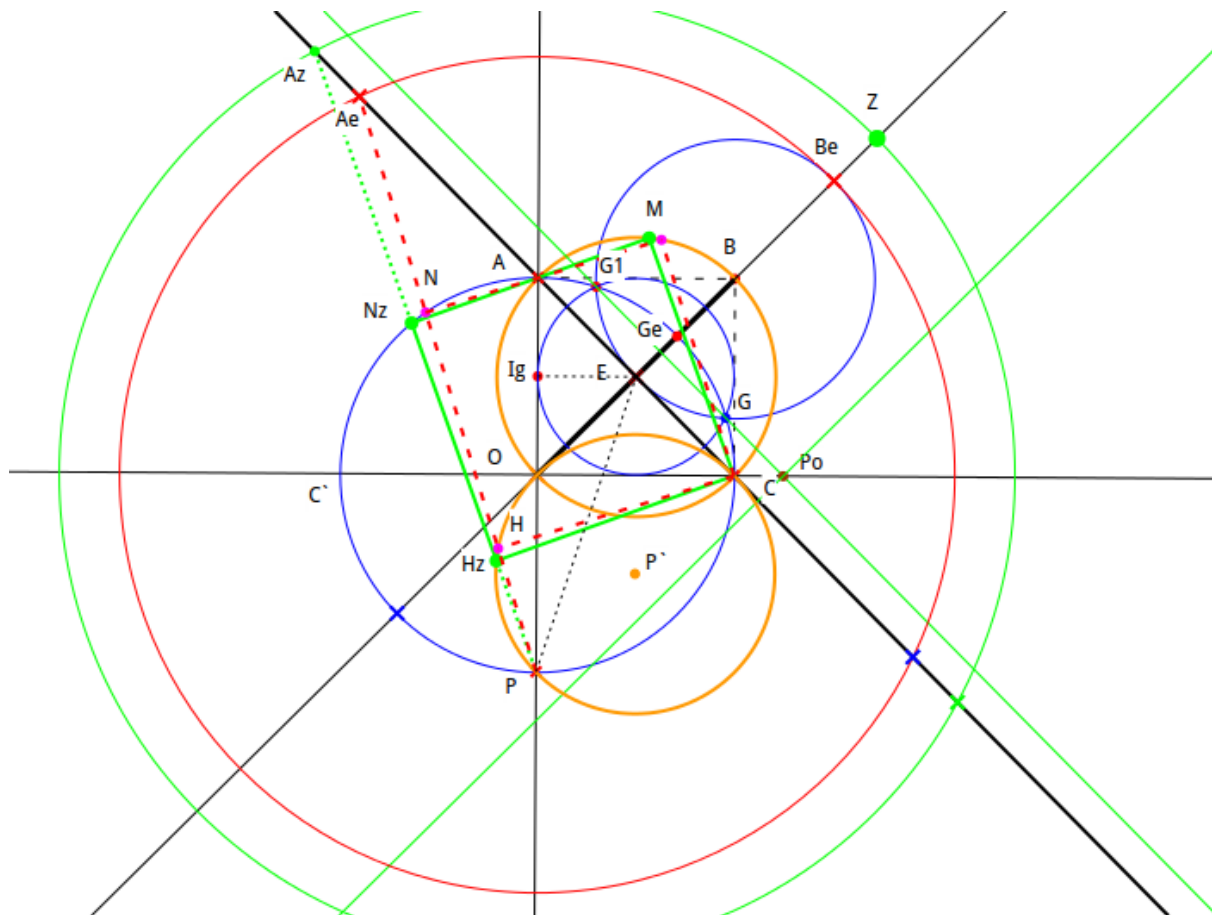


Figure – 51 – A macro - Presentation of The Quadrature – Method :

In--F-51 The Presentation of the Quadrature Method ,on Dr. Geo - Machine for Macro-constructions , Suitable for Programming the number , π .

The Inscribed Square CBAO ,with Pole-line AOP ,Rotates Through Pole P ,To the $\rightarrow$ Circle - Square CMNH with Pole-line NHP ,and To the $\rightarrow$ Circumscribed Square CAC'P , with Pole - line C'PP $\equiv$ C'P , of the Circle E ,EO = EC .

The limiting Position of circle (E ,EB) to (B ,BE = BB_e) defines B_e Point , and OB_e = OA_e radius , such that $\rightarrow 2 \cdot [CMNH]$ Square be equal to $\pi \cdot EA^2$, as in F -52 , where $GG_1 \perp OB$.

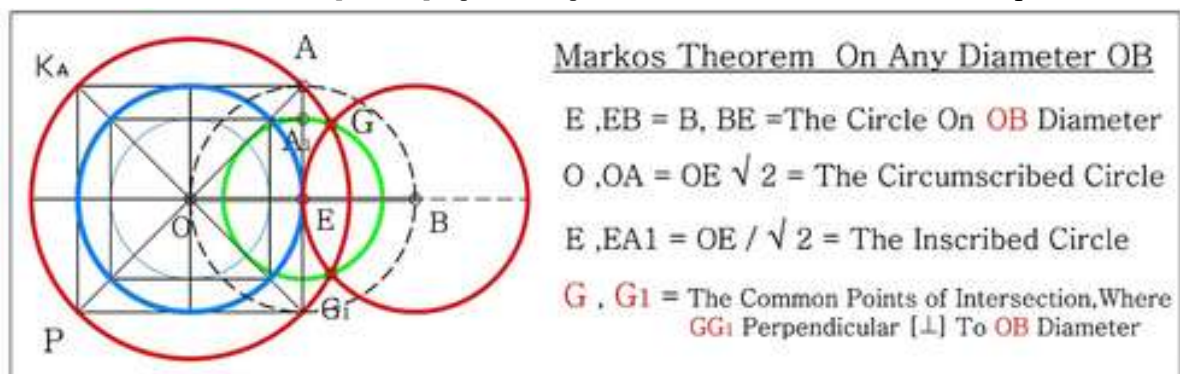


Figure – 52. Markos –Diameter-Circles -Theorem , On Any circle of Diameter OB :

The Theorem : [F-50 , F-51 , F52]

On Each diameter **OEB** of Any circle (E , E B) draw,

- 1.. The Circumscribed circle (O , OA = OE . $\sqrt{2}$) , *Blue* , At the Edge Point O , as center ,
- 2.. The Inscribed circle (E , OE/ $\sqrt{2}$ = OA/ 2 = EG) , *Green* , At the Mid - Point E , as center ,
- 3.. The Circle (B , BE = B , B_e) = (E , EO) , *Red* , At the Edge Point B as center ,

Then the Three circles Pass through The **Common Points** G , G₁ , and the Symmetrical To OB Point G₁ forming an axis Perpendicular to OB , which has the Properties of the circles , where the Tangent from Point B to the circle (O , OA = OC) is constant and equal to $2.EB^2$, and is related with , Resemblance Ratio Equal to 2 . In Concentric case Fig-49(1) , **Common Points** G , G₁ do not exist , **Ulless Become Two** .

On this Geometric Procedure , The Circle (E , EO) is Squared by Rotation , Expantion and Translation By Keeping , G G₁ , axis continuously Perpendicular To The Changeable-Squares CMNH –System .

The Common-Proofs [A-B-C] : In F.49-(2) , F.50-(5) ,
 Angle < CHP = 90° because is inscribed on the diameter CP of the circle (P' , P'P) .
 The supplementary angle < CHN = 180 – 90 = 90° . Angle < PNA = PNM = 90° because is Inscribed on the diameter AP of the circle (O , OA) and Angle < CMA = 90° because is Inscribed on the diameter CA of the circle (E , EA = EC) .

The Upper three angles of the Quadrilateral CHMN are , of a sum , of 90+90+90 = 270 , and from the Total of 360° , the angle < MCH = 360 – 270 = 90° , Therefore Shape CMNH is rightangled and on it exists CM ⊥ CH . Since also CM ⊥ CH and CA ⊥ CP therefore angle < MCA = HCP . The rightangled Triangles CAM , CPH are equal because have Hypotynousa CA = CP and also angles < CMA = CHP = 90° , < MCA = HCP , Therefore side CH = CM , and Because CH = CM , the Rechteangle CMNH is Square . The same for Square CM'N'H'(o.ε.δ),(q.e.d) .

This is the General Proof of the Squares on This Mechanism without Any - Assumptions .

From the equal triangles COH , CBM angle < CHO = CHM = 45° because lie on CO chord , and so Points H , O , M lie on line HM i.e.

On CA line , Any Segment PA → PA_z → PA_e → PC' = CA , drawn from Pole , P , beginning from A to ∞ , is intersecting the circumscribed (O,OA) circle , and the circle (P' , P'P = P'C = EO = EC) at the Points N , H , and Formulates Squares CBAO , CMNH , CM_zN_zH_z , CAC'P respectively , which are , The Inscribed , In-between , Circumscribed Squares , of circle (O,OE) = (E , EO = EB) = (P , P'O) .

Since angles < CA_zP , HCP have their sides CA_z ⊥ CP , A_zP ⊥ CH_z Perpendicular each other , then are Equal so Angle < PA_zC = PCH_z , and so **Point A_z , is Common** to circle O, OZ , **Pole-line** CA , and **Pole-axis** PN , Parallel to CM . Since PE is diameter on (P₁ , P₁ P) circle , Therefore Triangle E. I_g.P is right-angled and segment , EI_g , Perpendicular to OA and equal to OE/√2 = OA/2 , which is the radius of the Inscribed circle .

Since also Point , I_g , lies on PA , Therefore moves on (P₁ , P₁ P) circle and Point A on CA Pole-line , and so Point B is on the same circle as A_z , while Point B , moves on circle (E , EB) . Since Point A_z is The common Point of both **Expanding-Diameters** OB , CA and of both **Rotating-Arms** PA , PA_z , **Therefore Point A_e** is The common Point of the Three Squares , CBAO , CMNH , CAC'P , where CMNH ≡ $\pi \frac{(CA)^2}{4} \equiv \pi.EA^2 \dots(o.ε.δ)$
 B.. Proof (1) : F.50-(5) , F.51

(1) Any Point Z , which moves on diameter OB produced , Beginning from Edge-Point **G_e** of the First circle , Passing from center B of the Second circle , Passing from Edge-point **B_e** of the Third circle , and Ending to infinite ∞ , → Creates on the Three circles (O,OA) , (E,EO) , (B,BE) , with their centers on the diameter OB ,

The Changeable and moving Squares which are ,

- a)..The Inscribed CBAO , when Point Z ≡ G_e and center Point O ,
- b)..The In-between CM_zN_zH_z when Point Z ≡ B and center Point E ,
- c)..The Extrema CMNH , when Point Z ≡ B_e and center Point B ,
- d)..The Circumscribed CAC'P . when Point Z ≡ B_∞ and center Point ∞ ,

(2). Through the Four constant Poles , A,C,P – O of the Plane Procedure Mechanism , the Squares Rotate through , P , the Sides and Diametus Slide on OB as Squares , Anti-Squares . Point Z is moving from Edge Points G_e (forming Inscribed Square CBAO) , To in-between Points G_e - B_e (forming Squares CM_zN_zH_z) , to Extrema Point B_e (forming Square CMNH equal to the circle) , and to B_e → ∞ .

(3). Point I_g , belongs to the Inscribed circle (E, EO) and is Rotating, Expanding, Inscribed Edge Point on $(P_1, P_1 P)$ circle to I_g, I_b, I_e and to $\rightarrow P$ Point.

The other two, Sliding, Edge moving Points B, A, Slide on OB, CA, Pole-lines respectively. In Initial square COAB and rightangled Triangle COB the side CE squared is $CE^2 = EB \cdot EO = [\sqrt{2}CB/2] \cdot [\sqrt{2}CB/2] = CB^2/2$. In Edge Square CMNH and rightangled Triangle CHM the side CN/2 squared is $CE_e^2 = E_e M \cdot E_e H = [\sqrt{2}CM/2] \cdot [\sqrt{2}CM/2] = CM^2/2$. In Infinite Square CAC'P and rightangled triangle CPA the side CC'/2 = CO squared is $CO^2 = OA \cdot OP = [\sqrt{2}CA/2] \cdot [\sqrt{2}CA/2] = CA^2/2$.

From above relations and since $CE = OE$, $CE_e = (HM/2)$, $CO = CC'/2$ Then,

$$OE^2 = CB^2/2 = 2 \cdot CE^2/2 = [2/2] \cdot CE^2 = k \cdot CE^2, \text{ where } k = [2/2] = 1$$

$$CE_e^2 = CM^2/2 = k \cdot (CB^2/2) \text{ where } k = CM^2/CB^2 = CM^2/2CE^2$$

$$CO^2 = CA^2/2 = 2 \cdot [CB^2/2] = 2 \cdot CE^2 = k \cdot CE^2, \text{ where } k = [2/2/2] = 2$$

A – Proof (2 : F.49-(5), F.2- A

Since $BC \perp CO$, The tangent from Point B to the circle (O, OA) is equal to:

$BC^2 = BO^2 - OC^2 = (2 \cdot EB)^2 - (EB \cdot \sqrt{2})^2 = 2 \cdot EB^2 = (2 \cdot EB) \cdot EB = (2 \cdot BG) \cdot BG$ and since $2 \cdot BG = BG_1$ then $BC^2 = BG \cdot BG_1$, where Point G_1 lies on the circumscribed circle, and this means that BG Produced intersects circle (O, OA) at a Point G_1 twice as much as BG. Since E is the mid-Point of BO and also G mid-Point of BG_1 , so EG is the diametus of the Two - sides, BO, BG_1 of the triangle BOG_1 and equal to $1/2$ of radius $OG_1 = OC$, The base, and since the radius of the inscribed circle is half ($1/2$) of the circumscribed radius, Then the circle (E, $EB/\sqrt{2} = OA/2$) Passes through Point G. Because BC is Perpendicular to the radius OC of the circumscribed circle, so BC is a Tangent and equal to $BC^2 = 2 \cdot EB^2$, i.e. the above relation.

Proofs : F.(50) : (5-6) : Following again Prior A-B common Proof,

Angle $\angle CHP = 90^\circ$ because is inscribed on the diameter CP of the circle $(P', P'P)$. The supplementary angle $\angle CHN = 180 - 90 = 90^\circ$. Angle $\angle PNA = \angle PNM = 90^\circ$ because is inscribed on the diameter AP of the circle (O, OA) and Angle $\angle CMA = 90^\circ$ because is inscribed on the diameter CA of the circle, $(E, EA = EC)$. The Upper Three angles of the Quadrilateral CHMN are of a Sum of $90+90+90 = 270^\circ$, and from the Total of 360° , the angle $\angle MCH = 360 - 270 = 90^\circ$, Therefore Shape CMNH, is rightangled and exists $CM \perp CH$. Since also $CM \perp CH$ and $CA \perp CP$ Therefore angle $\angle MCA = \angle HCP$.

The rightangled Triangles CAM, CPH are Equal because have Hypotynousa $CA = CP$ and also angles $\angle CMA = \angle CHP = 90^\circ$, $\angle MCA = \angle HCP$ and side $CH = CM$ Therefore, Rectangle CMNH is Square on CA, CP Mechanism, through the Three constant Poles C,A,P of Rotation. The same for Square CM'N'H'. From the Equal triangles COH, CBM angle $\angle CHO = \angle CHM = 45^\circ$ Then Points H,O,M lie on line HM. i.e. Diagonal HM of Squares CMNH on Mechanism Passes through the central Pole O.

The Two Equal and Perpendicular Vectors, CA, CP, which is The Plane-Mechanism, of these Changable Squares through The Two constant Poles C, P, of Rotation, is converting The Circular-motion to Four - Polar Rotational - motion, and as linear motion Through Points O, A.

Transferring The above Property to [F.48 -(5)] Then when Point Z moves on OB line $\rightarrow$ Point A_Z moves on CA and $\rightarrow PA_Z$ Segment Rotates Through Point P, defining on circle $(P_1, P_1 P = P_1 E)$, the Idol, [The Points I_Z on circles O,OA = The Circumscribed $P'P'O$ = The Circle], and Points H, N such that Shapes $\rightarrow$ CHNM are all Squares between the Inscribed and Circumscribed circle. i.e.

Archimedes Trial, The Central – Expansion of The Inscribed to The Circumscribed circle, is altered to The Equivalent, An Polar and Axial-Rotational-motion on This Plane-Mechanism.

The areas of above circles are $\rightarrow$

$$\text{Area of Inscribed} = \frac{1}{2} \pi \cdot OE^2 = \frac{1}{2} \pi \cdot \frac{CB^2}{2} = \pi \cdot \frac{CB^2}{4} = \left[\frac{k\pi}{4} \right] \cdot CB^2 = m_i$$

$$\text{Area of Circle} = 1 \pi \cdot OE^2 = 1 \pi \cdot \frac{CM^2}{2} = k\pi \cdot \frac{CB^2}{4} = \left[\frac{k\pi}{4} \right] \cdot CB^2 = m_o$$

$$\text{Area of Circumscribed} = 2 \pi \cdot OE^2 = 2 \pi \cdot \frac{CA^2}{2} = 2 k\pi \cdot \frac{CB^2}{4} = \left[\frac{k\pi}{2} \right] \cdot CB^2 = m_c$$

and those of corresponding Squares, Then one Square of Plane Mechanism is equal to the circle, which one?

$\rightarrow$ That Square which is formed in Extrema Case of The Plane - Mechanism :

The radius of the inscribed circle is $AB/2$ and equal to the Perpendicular distance between center E, and

OA, so Any circle of EP diameter Passes through the Edge-Point (I_g), and Point (I_b) is the Edge common Point of the Two circles. G_e , The Common Edge –Point of the Three circles is (I_e) belongs to, the Edge Point, B_e , of circle (B , $BE = BB_e$), so exists,

Case	:	[1]	[2]	[3]	[4]
Point	Z at $\rightarrow$	G_e	B	B_e	B_∞
Point	A at $\rightarrow$	A	A(I)	A_e	A_∞
Point	I_g at $\rightarrow$	I_g	$I_z = I_b$	I_e	P
		$\downarrow$	$\downarrow$	$\downarrow$	$\downarrow$
Square		CBAO,	$CM_i N_i H_i$,	CMNH,	CAC'P

i.e. Square CMNH of case [3] is equal to the circle, and $CM^2 = CH^2 = \pi \cdot EA^2 = \pi \cdot EO^2$

On the Three - Circles (E , EO), (P_1 , P_1P), (O , OZ) and Lines OB, CA exists $\rightarrow$ F.49 - (5)

a)..Circle ($O, OZ = OG_e$) is Expanding To $\rightarrow$ ($O, OZ = OB_e$) Circumscribed circle, for the Inscribed CBAO Square,

b).. Point A, to $\rightarrow$ ($A - A_z$) is The Expanding Pole-line A - A_z for The In-between $CM_z N_z H_z$ Square,

c).. Circle (P_1, P_1I_g) is Expanding to $\rightarrow$ (P_1, P_1I_b) Inscribed circle (E , $E.I_g$) to I_b and I_e Point.

d).. Circle ($O, OB \rightarrow OB_\infty$, Pole-lines ($A - A_e \rightarrow A_\infty$) and ($P - P I_e = PP \rightarrow P$), for CAC'P Square, Point N on (O, OA), belongs to Circumscribed circle Point I_e , on circle with diameter, PE, belongs to the Inscribed circle (E , $E I_g = EG$) Point H, on ($P', P'O$), belongs to the Circle.

i.e. It was found a Mechanism where The Linearly Expanding - Squares $\rightarrow$ CBAO – CMNH – CAC'P, and circles $\rightarrow$ (P_1, P_1E) – (B , BE) – (O, OA), which are between The Inscribed and the Circumscribed ones, and are Polarly – Expanded as The Three – Poles – Squares - Mechanism.

The Problem is in Two dimensions determining an Edge Square between The inscribed and to The circumscribed circle. A quick measure for radius $r = 2694$ m gives a side of Square 4775 m, and $\pi = 3,1416048 \rightarrow$ Markos 11/10/2015.

The Segments $CM = CM'$, is the Plane Procedure Quantization of radius

$EC = EO = CP'$ in Euclidean Geometry, through this Mould, the Mechanism.

The Plane Procedure Method is called so, because it is in Two dimensions $\rightarrow CA \perp CP \leftarrow$ as this happens also in, Cube mould, for the Three dimensions of the Spaces, which is a Geometrical machine for constructing Squares and Anti -Squares and that one equal to the circle.

This is the Plane Quantization of, E - Geometry, i.e. The Area of Square CMNH is equal to that of one of the five conjugate circles, or $CM^2 = \pi \cdot CE^2$, and System with number π , to be a constant.

Remarks :

1...Since Monads $AC = ds = 0 \rightarrow \infty$ are simultaneously (actual infinity) and (Potential infinity) in Complex number form, this defines that the infinity exists also between all Points which are not coinciding, and ds, comprises any two Edge Points with imaginary Part, for where this property differs between the infinite Points between edges. This Property of monads shows the link between, **Space and Energy**, which **Energy is Between the Points and Space Is ON Points**. In Plane and on Solids, Energy is spread as the **Electromagnetic field** in surface. The Position and the distance of Points, can be calculated between the Points and so to perform $\rightarrow$ Independent Operations (Divergence, Gradient, Curl, Laplacian) on Points. This is the Vector relation of Monads, $ds = CA$, (or, as Complex Numbers in their General form being $w = a + b.i = \text{discrete and continuous}$), and which is the Dual Nature of Segments = Monads in Plane, to be discrete and continuous).

Their monad – meter in Plane, and in two dimensions is, CM, the analogous length, in the above Mechanism of the Squaring the circle with monad the Diameter of the circle. Monad is, $ds = CA = OB$, the Diameter of the circle (E , EA) with CBAO Square, on the Expanding by Transportation and Rotation Mechanism which is $\rightarrow$ {Circumscribed circle (O, OA) – Inscribed circle (E , $EG = E I_g$) - Circle (B , BE) } $\leftarrow$ In extended moving System $\rightarrow$ {OB Pole-line – CA Pole-line – Circle ($P_1, P_1B = P_1. I_g$) }, and is Quantized to CMNH Square.

The Plane Ratio Square of Segments – CE , CM - is constant and Linear , and for any Segment CN / 2 on circle in Square CMNH exists another one CE such that $\rightarrow EC^2 / (CN/2)^2 = k = \text{constant} \leftarrow$ i.e. The Square Analogy of the Heights in any rectangle triangle COB is linear to Extrema Semi-Segments (CN / 2) or to (CA/2), or the mapping of the continuous analog Segment CE to the discrete segment (CN / 2).

Using The-Stress-Relation $\sigma = \frac{F}{A} = \frac{2\pi r f}{\Phi} = \frac{w r}{\Phi} = \frac{v}{\Phi} = \frac{F}{CB.CB} = \frac{F}{CM.CM} = \frac{F}{CM^2} = \frac{F}{\pi.CM^2}$, Is Seen That , Point M is on circle (E , EA) and between Points B and A , **Length - CM continually Transports the Area $\equiv$ Stress** of the **Inscribed circle** , $\pi . EG^2$, To the **Circumscribed circle** , $\pi . EB^2$, through the **Wavy - Expanding-Circles** (O,OB) - (O,OB_E) - (O,OZ) , from radius , OB_E , to OZ , and from Pole P from PA to PA_E , and forming thus Square NCHM $\equiv$ CMNH , of Side CM , equal to Its-Inscribed-circle , $\pi . [\frac{CM}{2}]^2 \equiv \pi . EA^2 \equiv \pi . EB^2 \equiv \pi . EC^2$. and

The Position Point A_E , Transports The **Quantum-Stress-Quantity** , σ_E , **From CM Square $\equiv$ area - A** To Its **Inscribed Circle** $\pi . [\frac{CM}{2}]^2 \equiv \pi . EA^2$. Stress-Quantity-Algorithms in [91] Markos 30/12/2020

2... From Markos –Diameter-Circles-Theorem , On Any circle , Of **Diameter OB** , and circle (E , E B) , **The Circumscribed circle** (O , OA = OE . $\sqrt{2}$) At the Edge-Point O as center , **The Inscribed circle** (E , OE/ $\sqrt{2}$ = OA/ 2 = EG) At the Mid - Point E as center , **The Circle** (B , BE = B , BB_E) = (E , EO) At the Edge-Point B as center , **Have Two-Common - Points G , G₁** , where G₁ is Symmetrical to OB , **On TPRS F Mechanism** , called $\rightarrow$.**The Three – Poles – Rotational - Squares-Formation** $\leftarrow$ Fig-51-52.

Concentrical Circles have **None-common-Point** because , a Center is **Not An-Geometric-Vector** as is The OB Diameter .In Mechanics an **Energy-Vector** is an **Conductor** $\overrightarrow{AK_A} = |Q|_{\pm}$, as is The Quaternion in Material-Geometry where motion is transferred from One Edge Point A , to the Other Edge Point K_A . After the Completing of Squares , The Inscribed Square **CBAO** Rotates through P and Pole-line **POA** , To Square **CMNH** and the Pole-line PNA_E To Circumscribed Square CAC'P and Pole-line PC'P_E .

Because The Symmetry On OB , of the Three circles **Common-Points** , G , G₁ , **Point A_E** is The Common **Point of The Expanding-Diameters** , OE , OB , OB_E , of **OB Diameter** , and On Perpendicular Expanding Diameter CA , of **The-Rotating - Arms** , PA , PA_Z , PA_E , and The Perpendicular On CA , Expanding Vectors , CA , CA_E , C $\rightarrow \infty$, [The Proofs from Priors] .

or The referred Procedure **Changes** Inscribed Square **CBAO** $\rightarrow$ To Square **CMNH** equal to Circle $\pi . [\frac{CM}{2}]^2$, and equal to (EA)² , (which is The **Anti-Quadrature**) by Expanding CB side To CM side , and CM side To CA side . Polar-Point A_E Is The common Point Of **The $\rightarrow$ G G₁ axis $\leftarrow$** , And Of The-Three-Energy - Squares , CBAO , CMNH , CAC'P , on {TPRSF} , . **i.e.**

CB x CO Square (x) CB $\equiv$ Square-Pyramide , which occupies **The -Pivot-Axis -Height Changes** , To { **CM x CH Square** } (x) **CB $\equiv$ Square-Prisma** , keeping **The -Pivot-Axis $\equiv \pi . [\frac{CM}{2}]^2$** (x) **CB $\equiv$ Circular Pyramid** , and To **CA x CP Square = 2 x CB² Squares (x) CB $\equiv 2.CB^3$** , keeping **The -Pivot-Axis $\equiv 2.CB^3$** which is The **Geometrical Duplication of the Initial - cube** CB x CB x CB = CB³ .

When Diameter D of a circle **Is-Found In STPL-Three-Poles-Squares-Rotational-System** The **E-Conductor** **D = $\overrightarrow{AK_A} = Q_{\pm} = |\frac{cS}{r^2}| = I_E$** = The- Electric-Wave-Intensity , **And** , **A $\uparrow$ K_A $\equiv I_M$** ,The-Magnetic-Wave-Intensity and **Vectors-Square = $[\overrightarrow{AK_A}] \times [\overrightarrow{A \uparrow K_A}] = [Q_x Q_y] = k_x k_y \equiv$ The Energy-Square $\equiv CM \times CM = CMNH$** on (E,EA) circle , and in Space **Energy-Volume $\equiv [\overrightarrow{AK_A}] \times [\overrightarrow{A \uparrow K_A}] \times [D] \equiv CMNH \times$ [Energy-Quantum $\overrightarrow{Q \times \rightarrow} \equiv CMNH \times \overrightarrow{Q \times \rightarrow} \equiv CMNH \times \overrightarrow{k \times \rightarrow} \equiv$ TOTAL - Energy in The Propagating Electromagnetic Wave { **I_E $\perp$ I_M** } .**

The Physical Notion of The Quadrature :

The exact Numeric Magnitude of number π , can be found only by Numeric calculations . [44] All magnitudes exist on The $<$ Plane Formation Mechanism of the first dimentional Unit AB $>$ as Geometrical elements consisting , The Steady Formulation ,(The Plane System of the Isosceles Right-angle Triangle ACP = AB_EC , with the Three Circles on the sides) and The moving and Changeable Formulation of The Twin , **System-Image** , (This Plane -Perpendicular-System of Squares , Anti-squares is such that , The Work Produced in an between closed Area to be Equal to Zero) . Starting from this logic of correlation

upon Unit , we can control Resemblance-Ratio and construct all Regular Polygons On the Unit Circle as this is shown in the case of Squares . On System **CO** , **CP** of These Three circles (The Plane Procedure Mechanism which is a Constant System) is created also , a Continues and a Not Symmetrical Formation , The Changeable System of the Regular-Polygons , and the Image (Changeable System of Regular Anti-Polygons on **CP** axis) **The Idol** as This in Space and in motion , Was-Proved that , in this Constant-System The Rectilinear motion of the Changeable-Formation is Transformed into An Twin and Symmetrically axial - Centrifugal Pole Rotation (This is the motion on the Four-Poles System) .The conservation of the Total Impulse and Momentum ,as well as the conservation of the Total Energy in this Constant System with all Properties included , exists in this Empty Space of the Un-dimensional Point Units of mechanism . All The forgoing referred can be shown (maybe presented) with a Ruler and a Compass , or can be seen , live , on any Personal Computer . The method is Presented on Dr .Geo machine . **The Theorem of Hermit-Lindeman That number , pi , is not algebraic , is based on the Theory of Constructible numbers and number fields (on number analysis) and NOT on The < Euclidean Geometrical origin-Logic on Unit elements Basis > . Present - Mathematical-Reasoning ,** The Method , is based on The Restrictions imposed to seek The Solution i.e. < **with a Ruler and a Compass** which is such This Problem > . By extending Euclid logic of Units on The Unit-circle to unknown and Now Proved Geometrical-Unit-Elements as , **Wave-Energy-Squares** , Thus The settled age-old question for The Unsolved and continuously standing Problems is Now Approached and Solved . All Mathematical interpretation and The relative Philosophical Reflections Based on the Theory of the Non-Solvability must Properly Revised .

Application in Physics :

From Math theory of Elasticity , Cauchy equations of Stresses in Three dimensions , x, y, z , are ,

$$\frac{\partial \sigma_x}{\partial x} + \frac{\partial \tau_{yx}}{\partial y} + \frac{\partial \tau_{zx}}{\partial z} + X = 0 \quad , \quad \frac{\partial \tau_{xy}}{\partial x} + \frac{\partial \sigma_y}{\partial y} + \frac{\partial \tau_{zy}}{\partial z} + Y = 0 \quad , \quad \frac{\partial \tau_{xz}}{\partial x} + \frac{\partial \tau_{yz}}{\partial y} + \frac{\partial \sigma_z}{\partial z} + Z = 0 \quad ,$$
 where are ,
 $\sigma_x, \sigma_y, \sigma_z$ = Principal Stresses in x, y, z axis , $\tau_{xy}, \tau_{xz}, \tau_{yz}$ = Shear-stresses in xy, xz, yz Plane ,
 X, Y, Z = The components of External Forces and of Strain , $\frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = 0$, $\frac{\partial}{\partial x} \frac{\partial v}{\partial y} = 0$, $\frac{\partial}{\partial x} \frac{\partial w}{\partial z} = 0$
 where $u = u(y, z) \rightarrow$ are Deformation components , The Displacements , in y, z axis .
 $v = c \times z$ The Rotation on , z , axis
 $w = -c \times y$ The Anti-rotation in , y , axis .

Applying above equations on an **Orthogonal section of a Solid** , then exist the differential equations of Equilibrium , and for the Boundary conditions is found that , The Stress function is satisfying equations ,

$$\frac{\partial \tau_{yx}}{\partial y} + \frac{\partial \tau_{zx}}{\partial z} = \frac{\partial \gamma_{yx}}{\partial y} + \frac{\partial \gamma_{zx}}{\partial z} = \frac{\partial^2 u}{\partial y^2} + \frac{\partial}{\partial x} \frac{\partial v}{\partial y} + \frac{\partial^2 u}{\partial z^2} + \frac{\partial}{\partial x} \frac{\partial w}{\partial z} = 0 \quad \dots\dots\dots (1)$$

$$\text{and the boundary conditions on solid's surface ,} \quad \frac{\partial u}{\partial y} dz - \frac{\partial u}{\partial z} dy + y dy + z dz = 0 \quad \dots\dots\dots (2)$$

$$\text{where , } \gamma_{xy}, \gamma_{xz}, \gamma_{yz} = \text{The Slip components , where is , } \gamma_{xy} = \frac{\partial u}{\partial y} + \frac{\partial v}{\partial x} \quad \dots\dots\dots (3)$$

Above equations show that , The Resultant Shear-Stress at the Boundary is directed along the Tangent to the Boundary and that the Stress function $u = u(yz)$ must be constant along the Boundary of the Cross-Section i.e. each Cross Section on , x , axis is Rotated as a Disk in its Plane , from which Points follow relation $u = u(y, z)$ and since Stress functions are constant , Then from equation (2) $y dy + z dz = 0$ or $y^2 + z^2 = \text{constant}$, meaning that a **Cross-Section under Stress** stays Plane **Only in circle circumference** , or a Plane-Space under

Energy Stress , remains Flat **Only-When the Plane - Section becomes a circle** , and is applied on the **Plane-Mould** , i.e. follows the **Three-Poles-Squares- Mechanism** , which is the Squaring of the circle.

The same is seen in Laplace's equation $\rightarrow \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} \equiv \nabla^2 u = 0$, which is termed a Harmonic function.

Placing $\nabla^2 u = 0$ in both Parts of the equation of the circle , becomes Identity and , $\nabla^2 u.(y^2+z^2) = \nabla^2 u.(c)$, or Any Monad $\equiv$ Quaternion , consisted of $\rightarrow$ The Real - Part the Plane -Space , and under Energy Stress $\rightarrow$ The Imaginary Part , remains in Flat Only-When the Plane becomes a circle , i.e. the **Energy-Space** discrete continuum follows Extrema Euclidean-Geometry Mould , π , which is the Squaring of the Circle .

If Potential - Energy is Zero Then Vector , $\bar{\tau}$, is on the Surface indicating The conjugate function. [49].

In Electricity , when an Electric Current flows through a Conductor , Then a Transverse Circular Electromagnetic field is Produced around itself , following The Vector – Cross - Product Plane Mould , π . Because , The n th - degree - equations are The vertices of the , n -Polygon in circle so π , is Their mould . Analogous equations of motion is in Quadrature-System where equation of moving-Squares , $\mathbf{m} \cdot \dot{\mathbf{s}} + \mathbf{w}^2 \cdot \mathbf{s} = 2$ with masses m_1, m_0, m_c , and mass-Inertia I_1, I_0, I_c equal to the frequency of The Changeable-Square $X^2 = [\text{HN}]^2$, in Space-cave circle $\pi \cdot r^2 = \pi \cdot [\text{EA}]^2$, where Primary equation of **Circles** is $\rightarrow \mathbf{w}^2 \cdot \pi \cdot \mathbf{m}_{1-c} = \pi$ = **constant** $\leftarrow \dots (\pi)$ and The Common frequency $\mathbf{w}$ defines That **Changeable-Square such that** ,

$$X^2 = [HN]^2, \text{ to be equal to Cave EA, and } \pi = \frac{(HN)^2}{(EA)^2}. \text{ The Method in [95]}$$

Remarks :

- 1... The Resultant Shear-Stress, *which is the Energy –Part of Quaternion*, at The Boundary of a Section follows The direction of the Tangent and in order to be continuously constant becomes the circle schema. Drawing at, **x** Point Circumscribed-circle, **y** Point The-circle, **z** Point Inscribed-circle, then becomes The **Three-Poles-Rotation-Squares-Mechanism** on where An **Square become Circle** and the **Cube-Doubled**.
- 2.. The moving Squares are Rotating Through Point C, a Pole which denotes The Beginning of the Spaces while the other Two Poles, A, P, are Neutral Positions, where The Square-Sides are sliding as this occurs in STPL Mechanism with the Neutral Constituent, or in Geometry with Zero numbers.
- 3.. The Stress function is the **Energy-Part** and denotes the motion while Boundary-Points denote the Space meaning that to exist Equilibrium is needed The **Opposite-Energy-Part** which is The, –, Stress Laplace function and the Centripetal and Centrifugal-forces in Newton's Physics. P-107
- 4.. Stresses exist in couples and keep Points together. Stresses are absent outside them, But Become forces in critical Positions, *The Structure of Geometry to be Vector, line or Volume*, P-107, or when is Possible a Set of Stresses on a Set of Points to be Force-Vector. Two Force-Vectors consists an Stationary-Energy-Square.
- 5.. The Extreme case, where Surface is interchanged as line or and as line-segment or a Plane Surface as a Type of vanishing-Shear due to layers laterally shifted, Then motion follows That Shema which keeps Stresses and Surface Constant and in our case the circle. As The Duality-Photon is an Electromagnetic Wave which carries An **Energy-Storage**, The same to Forces which are Electromagnetic-Waves and carry Their **Energy-Storage**. This Storage is their Strength-Vector which is Energy in An Propagating-Wavelength. Motion in Conductors allows to Energy to acquire the **meter of motion**. This Energy-Quantity is the **Quantum** of Energy $2E = B w$.
- 6.. **The Extreme Case** [69] Page 54 where for all motions $\bar{B}$, $\bar{w}$, are constants and from Poinot's solution $w_1^2 + J_2 w_2^2 = a^2$, Then Angular velocity-Ellipsoid is Symmetrical to, **z**, axis, and all of equal distance from O, Tangential Planes are Symmetrically Placed around, **z**, axis and so The Polar-Paths are **Parallel circles**.

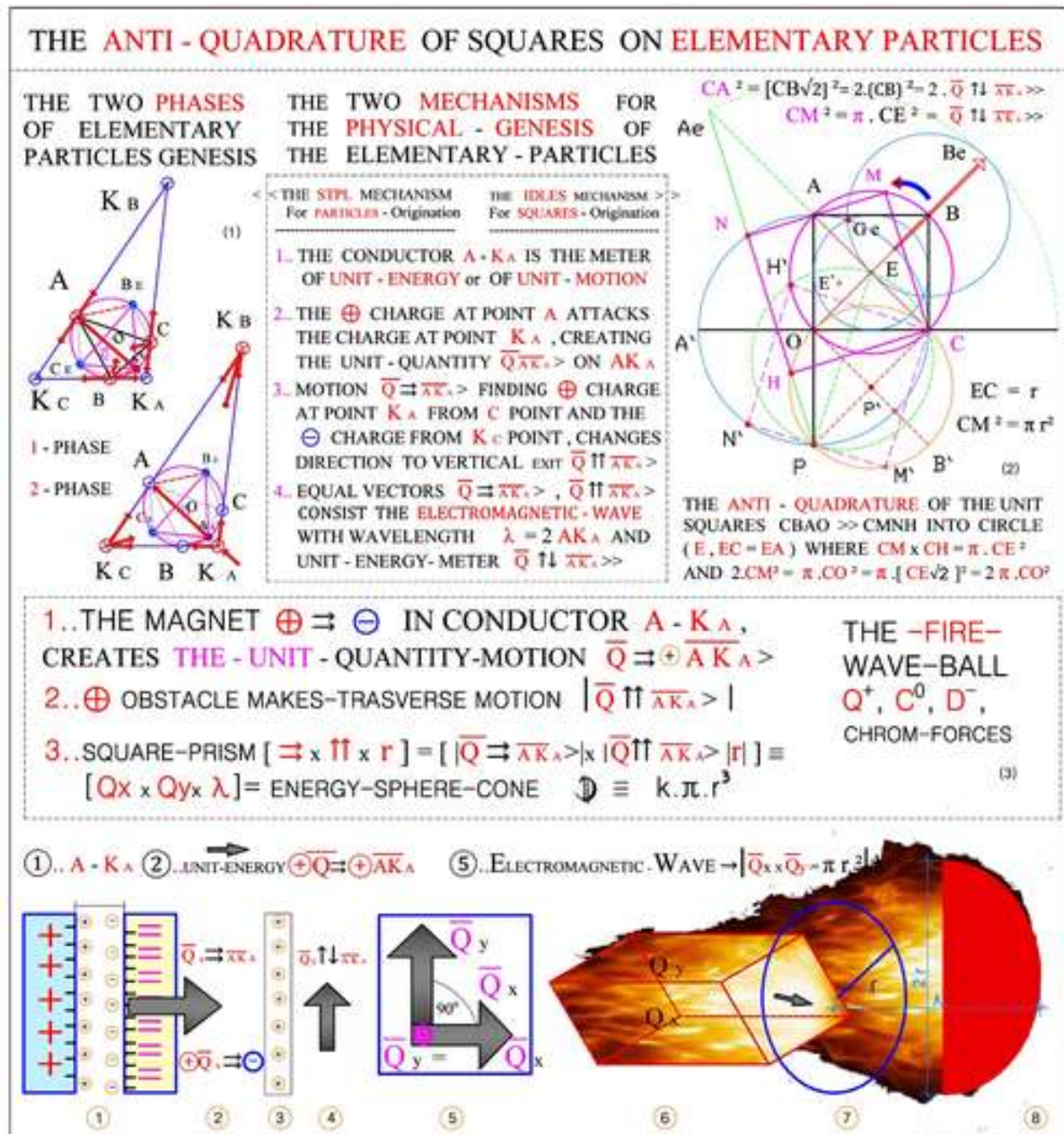


Figure – 53. Markos-Anti-Quadrature Justified From The Physical-Force-Charges , as an 2-3-Phase -RLC

Circuit , { Square-Prism , $|Q_x|Q_y|\lambda$ } , To An Equivalent and Energy-Sphere - Cone , { $\mathbb{C} = k \pi r^3$ } , Vibrations in Conductor AK_A , Possessing Elasticity , are related to the Oscillatory Linear motion of the Positive $\oplus$ charge towards the Negative $\ominus$ charge , The inherent Forces associated with them , and when-external are absent . Because Forces *can't exist by itself* , and this because there must always be an equal and an Opposite Reaction-Force acting on the Opposite Position or Direction for Equilibrium , *The same is for Charges* which need the Opposite-Charge to move . Conductor AK_A needs Point A to be Positive $\oplus$ charge and Point K_A to be The Negative $\ominus$ charge as , $\overline{AK_A}$ and assumed to be thin and uniform along its length of area A , and density ρ . Due to axial Forces $Q_{AK_A} = P = |\oplus \times AK_A|$ will be Displacement , u , along the Conductor that will be a function of both Positions , x , and time t . Because Conductor has an Infinite number of Natural-modes of vibration the distribution of the Displacements will differ each mode . Conductor $|AK_A| \equiv \oplus \rightarrow \ominus$ denotes , Edge A to K_A , and Conductor $|K_A A| \equiv \ominus \rightarrow \oplus$ is right if $\oplus$ is found at K_A Point and $\ominus$ at Point A as , $|K_A A| \equiv \oplus \rightarrow \ominus \equiv -|AK_A|$ For a Conductor with Constructive Interference $K_A A \equiv \oplus \rightarrow \oplus$ issues either $2 \rightarrow \oplus$, or $\oplus \leftrightarrow \oplus$ a Stationary-Wave with ϕ Phase . Energy is , the Second Isochromatic fringe order and , $E = [\frac{4\pi r^2}{3}] \cdot f_1 \cdot [2] \rightarrow \phi$

ANALYSIS :

From Mechanics Displacement at Point x of Conductor D , is $x + dx$ and will be $u + (\frac{\partial u}{\partial t}) \cdot dx$, and the Unit

Strain is $(\frac{\partial u}{\partial x})$. From Hook's law, $\sigma = E u$, The ratio of Unit-Stress to Unit-Strain is equal to the modulus of Elasticity E , and Then issues $\frac{\partial u}{\partial t} = \frac{\text{Force}}{A \cdot E} = \frac{P}{A \cdot E}$, and by differentiation $\rightarrow A \cdot E \cdot \frac{\partial^2 u}{\partial x^2} = \frac{\partial P}{\partial x} \dots (1)$

Applying Newton's law of motion for the element dx and equate the Unbalance-force $\frac{\partial P}{\partial x}$, to the Product of the mass and acceleration of the elements then $\frac{\partial P}{\partial x} dx = \rho A dx \frac{\partial^2 u}{\partial t^2} \dots (2)$ Eliminating $\frac{\partial u}{\partial x}$ then we have

The Partial differential equation $\frac{\partial^2 u}{\partial t^2} = (\frac{E}{\rho}) \frac{\partial^2 u}{\partial x^2} \dots (3)$ and $\frac{\partial^2 u}{\partial x^2} = (\frac{\rho}{E}) \frac{\partial^2 u}{\partial t^2} \equiv [\frac{1}{c^2}] \cdot \frac{\partial^2 u}{\partial t^2} \dots (4)$ where

$\bar{c} = \sqrt{\frac{E}{\rho}}$, IS The velocity of Propagation of the Displacement along the Conductor or $\rightarrow$ **The Stress-Wave** $\leftarrow$

Applying equation (4) in Conductor $D = AK_A$ with both ends Free, Then the Natural-frequencies must be zero because charges $\oplus$, $\ominus$ interchange at both ends, A , K_A , and issues $\frac{\partial u}{\partial t} = 0$ at $x = 0$ and at $x = D = AK_A$.

The Two equations of (5) corresponding to these, *Stretched* $\equiv$ *linear*, boundary conditions which are as,

$$\begin{aligned} \left\{ \frac{\partial u}{\partial x} \right\}_{x=0} &= A \frac{1}{c} [C \sin wt + D \cos wt] = 0 \\ \left\{ \frac{\partial u}{\partial x} \right\}_{x=D} &= \frac{w}{c} \cdot [A \cos \left| \frac{w \cdot AK_A}{c} \right| - B \sin \left| \frac{w \cdot AK_A}{c} \right|] \cdot [C \sin wt + D \cos wt] \dots (5) \end{aligned}$$

Equation (5) must be true for any time t , Therefore from the First equation $A = 0$.
From the Second equation B must be finite in order to have vibration, and is satisfied

$$\text{when, } \sin \left| \frac{w \cdot AK_A}{c} \right| = 0, \text{ or, } \left| \frac{w \cdot n \cdot AK_A}{c} \right| = \left| \frac{w \cdot n \cdot d}{c} \right| = \pi, 2\pi, 3\pi, \dots, n\pi, \dots (6)$$

where, n = The order of The mode and equation of motion **In Conductor $D = d = AK_A$** , it is an

longitudinal-vibration $u = u_0 \cos \left[\frac{n\pi}{d} \right] \cdot \sin \left[\frac{n\pi}{d} \right] \cdot c \dots (7)$ a Cosine-Wave having n , nodes in Pipe d .

The equation of motion for **Longitudinal wave** in Conductor AK_A is $\rightarrow y(x, t) = N \cdot \sin [kx - wt + \phi] \leftarrow (8)$
where, c = the light velocity-vector, N = the amplitude, w = the angular velocity-vector, ϕ = The Phase angle

$k = \frac{2\pi}{\lambda} = \frac{\pi}{r_L}$ = Propagating-Energy Constant = Wave-number, λ = The Wave length, $\bar{v} = \frac{w}{k} = \frac{\lambda}{T} = \sqrt{\frac{T}{m}} = \sqrt{\frac{E}{\rho}}$

The light-velocity in Conductors. The frequency of Longitudinal wave is $f_L = [n] \frac{\bar{v}}{2\lambda} = 0, \frac{1 \cdot c}{2\lambda}, \frac{2 \cdot c}{2\lambda}, \frac{3 \cdot c}{2\lambda}, \dots, \frac{n \cdot c}{2\lambda}$

The equation of motion of a **Standing-Wave** in Conductor $AK_A \equiv 2|r_{A-KA}| \equiv r_L \equiv \lambda$ is,

$$y(x, t) = 2N \sin[kx] \cdot \cos[(w = 2\pi c/\lambda)t] \dots (9) \text{ where Longitudinal-frequency } f_L = (n + \frac{1}{2}) \frac{\bar{v}}{2\lambda}$$

Amplitudes become zero at $y = 0$ when $kx = 0$ which implies $kx = n\pi$, $n = 0, 1, 2, 3, \dots, n$.

and Since the sine-function repeats itself after every 2π change in angle, which is The Wavelength λ , of the Wave, Then $\sin[kx] \equiv \sin[kx + 2n\pi] \equiv \sin[k \cdot (x + \frac{2n \cdot \pi}{k})]$, and for $n=1$, $\lambda = \frac{2 \cdot 1 \cdot \pi}{k} = \frac{2\pi}{k}$, and $k = \frac{2\pi}{\lambda} \dots (10)$

Since, $k\lambda = 2\pi$, is constant and λ , is the displacement for $n=1$, Then implies k , is Force and because Force $\times$ Displacement = Work $\equiv$ Energy $\equiv$ motion, therefore $k\lambda \equiv E \equiv \text{Constant} \equiv$ **The Energy-Quantum**

Frequency is $f_L = (n + \frac{1}{2}) \frac{\bar{v}}{2\lambda} \equiv \frac{0.5 \cdot c}{2\lambda}, \frac{1.5 \cdot c}{2\lambda}, \frac{2.5 \cdot c}{2\lambda}, \frac{3.5 \cdot c}{2\lambda}, \dots, \frac{(2n+1) \cdot c}{2 \cdot 2\lambda} = \frac{1}{2} \left[\frac{c}{2\lambda} \right], \frac{3}{2} \left[\frac{c}{2\lambda} \right], \frac{5}{2} \left[\frac{c}{2\lambda} \right], \dots, \frac{2n+1}{2} \left[\frac{c}{2\lambda} \right]$

A Wave is a Force $Q_{AK_A} = P = |\oplus \Rightarrow AK_A|$, an Energy-Vector $|\oplus Q \Rightarrow \overleftarrow{AK_A}| \equiv |\leftrightarrow|$ that Propagates

from the Place, *The Point A*, where it was created so, **when** is found **an Obstacle at Point K_A** , Then

the Particles of the Conductor medium oscillate Perpendicular, IS THE – ONLY – EXIT, to the direction

of the **Wave-Propagation**, and by this Way motions continue as Longitudinal Wave in Conductor AK_A .

The Obstacle at K_A Point, is *The Presentation of the, $\oplus$ constituent and The Absent of $\ominus$ constituent.*

The **Transverse - Propagating-Wave** or the moving Energy-Vector, $|\oplus Q \uparrow \overleftarrow{AK_A}| = |\uparrow|$ at node K_A with

Energy-Vector $|\oplus Q \Rightarrow \overleftarrow{AK_A}| \equiv |\leftrightarrow|$ at node A consist The **Electromagnetic -Wave** in AK_A Conductor.

The Energy in this **Stationary Wave** is $E = h f_L = h \frac{2n+1}{2} \left| \frac{c}{2\lambda} \right| = \frac{2n+1}{2} \left| \frac{hc}{2\lambda} \right| = \frac{3 \cdot hc}{4\lambda} \dots (11)$

From relation $\lambda = cT = \frac{c}{f} = \frac{2\pi}{k}$, Then $k = \frac{2\pi}{\lambda} = \frac{2\pi f}{c} = \frac{w}{c} = \left| \frac{\bar{v}}{c} \right| \cdot \frac{1}{r}$, or the Propagating-Transverse-Wave

carries **The Standing-Wave-Energy-Constant-magnitude** $k = \frac{2\pi}{\lambda} = \frac{2\pi f}{c} = \frac{w}{c} = \left| \frac{\bar{v}}{c} \right| \cdot \frac{1}{|r_{A-KA}|} \dots (12)$

Because The two Perpendicular **Energy-Vectors**, $|Q \Rightarrow \overleftarrow{AK_A}| \equiv \leftrightarrow$, $|Q \uparrow \overleftarrow{AK_A}| \equiv \uparrow$, of This Propagating

Energy, FORM The **Energy-Square**, $\{|\leftrightarrow| \cdot |\uparrow| \} \equiv |Q \Rightarrow \overleftarrow{AK_A}| \cdot |Q \uparrow \overleftarrow{AK_A}| \equiv u_0$, on Conductor AK_A , Then

$$\text{Energy-Square-Prism}, |AK_A| \cdot \{Q \rightrightarrows \overrightarrow{AK_A}\} \cdot \{Q \uparrow \overrightarrow{AK_A}\} = |Q_x \cdot Q_y| \cdot |AK_A| = |k_x \cdot k_y| \cdot |AK_A| = |\leftrightarrow| \cdot |\updownarrow| \cdot |AK_A| \dots (13)$$

And Total Energy $2L = B w \equiv E_K + E_U \equiv |k_x| \cdot |x| \cdot |k_y| \cdot |x| \cdot |AK_A| \equiv |k_x| \cdot |x| \cdot |k_y| \cdot |x| \cdot |\lambda| \equiv$ An Propagating-Wave in λ ,

i.e. Energy-Square-Prism is a Moving-Energy-Volume and **Because** from Cauchy equations of Stresses in three dimensions, **The Energy Stress remains Flat ONLY- WHEN the Plane-Section becomes a circle**, **And Because** from Mechanics the **Sphere** occupies the **Least - Resistance** to the motion, Then the

Square -Prism is altered to the Equivalent, **Energy – Sphere – Cone** $\rightarrow \mathbb{C} = k \pi r^3 \leftarrow$

Where the **Cube** $|\leftrightarrow| \cdot |\updownarrow| \cdot |AK_A| = x^3$ becomes a **Sphere–Cone** $\equiv Q \cdot \overrightarrow{AK_A} \rightarrow |\frac{\lambda}{\updownarrow}| \rightarrow k \pi r^3 = x^3$

For the max-sin $|\frac{w \cdot AK_A}{c}| = 1$, of equation (6) then $u = [C \sin wt + D \cos wt] \cdot \sin |\frac{w \cdot AK_A}{c}| \dots (14a)$

The condition $u = y(AK_A, t) = 0$, leads to the equation $\rightarrow \sin |\frac{w \cdot AK_A}{c}| = 0$, or to equation (14)

For Duality-Photons, $\bar{v} \cdot [\frac{\bar{f}_n}{\pi^2 \cdot r_n^4} \cdot \overrightarrow{B_n}] + |\bar{c}| \cdot f_n \dots (15a)$

Or $\bar{v} \cdot [\frac{\bar{f}_n}{2 \cdot |AK_A|} \cdot \frac{\bar{c}}{2 \cdot |AK_A|}] + [f_n \equiv n \cdot \frac{\bar{v}}{2\lambda}] \equiv \bar{v} \cdot \{|\frac{\bar{c}}{2\lambda}| (n + \frac{1}{2}) + \frac{n}{2\lambda}\} \dots (15)$

Energy-Vectors $|Q \rightrightarrows \overrightarrow{AK_A}| = |\leftrightarrow| \cdot x \cdot |Q \uparrow \overrightarrow{AK_A}| = |\updownarrow| \cdot |x| \cdot |AK_A| \equiv |Q_x \cdot Q_y| \cdot |AK_A| \equiv |\leftrightarrow| \cdot |x| \cdot |\updownarrow| \cdot \lambda \equiv k \pi r^3$.

From Wave-Energy-constant $k = \frac{2\pi}{\lambda} = \frac{2\pi f}{c} = \frac{w}{c} = |\frac{\bar{v}}{c}| \cdot |\frac{\bar{v}}{c}| \cdot |\frac{1}{r_{A-KA}}|$ then $c = \frac{w}{k} = \lambda f$, or $|\frac{\bar{c}}{2 \cdot |AK_A|}| \equiv f$ i.e.

Frequency f_{AK_A} of Pipe $|AK_A|$ is the Stationary-Photon Energy-Storage $[\frac{\bar{f}_n}{2 \cdot |AK_A|}] = |\frac{\bar{c}}{2 \cdot |AK_A|}| = |\frac{\bar{c}}{\lambda}| \dots (16)$

and Photon $\bar{v} \cdot [\frac{\bar{f}_n}{\lambda} + f_n] \equiv \bar{v} \cdot \{|\frac{\bar{c}}{\lambda}| + f_n\}$ i.e., **Particle** $\equiv \bar{v} \cdot |\frac{\bar{c}}{\lambda}| \equiv E_U$, and **Wave** $\equiv \bar{v} \cdot f_n \equiv E_K$

Since Energy-Constant-magnitude k denotes **motion**, Then needs a Scalar-Magnitude for measurements and a Vector-Magnitude for the Directions. In Conductor $D = |AK_A|$, $|D| \equiv$ The Scalar-Magnitude which gives the Direction of motion with Points, A, K_A , as $\overrightarrow{AK_A}$, and Direction meaning, The Vector $\overrightarrow{AK_A}$.

Since Area of circle (E, EA) is, $\pi (EA)^2$, and Area of circle (E, OC = $\sqrt{2}EA$) is $\pi (\sqrt{2}EA)^2 = 2 \cdot \pi (EA)^2$, i.e.

Area of circle on CA' = $\sqrt{2}$ · CA Diameter, is Double The area of circle on CA Diameter And $(x')^3 = 2x^3$.

which is The **Geometrical-Anti-Quadrature**. Fig-53-2.

THE System of the Infinite **Rotative and Changeable-Squares From Constant-Point, C, Builds** Squares

On Diameter CA = 2r, The **Circle [E, r]** {The Resultant of $\overrightarrow{CB} \uparrow, \overrightarrow{CO} \leftarrow$ Vectors} And **Square $\overrightarrow{CB} \times \overrightarrow{CO} = 2r^2$**

On Diameter CN = $\sqrt{2}\pi \cdot r$, The **Circle [E, $\sqrt{\pi/2} \cdot r$]** {The Resultant of $\overrightarrow{CM} \uparrow, \overrightarrow{CH} \leftarrow$ Vectors}, **Square $\overrightarrow{CM} \times \overrightarrow{CH} = \pi r^2$**

On Diameter CA', The **Circle [O, OC = $r \cdot \sqrt{2}$]** {The Resultant of $\overrightarrow{CA} \uparrow, \overrightarrow{CP} \leftarrow$ Vectors}, **Square $\overrightarrow{CA} \times \overrightarrow{CP} = 4r^2$**

Denotes The E-Square $CBAO \equiv 2r^2 \Rightarrow$, Square $CMNH \equiv \Rightarrow \pi \cdot r^2$, And Anti-Square $CAA'P \equiv \Rightarrow 4\pi \cdot r^2$, And

The **Changeable-Square-Prisms**, {CBAO x PA}, {CMNH x PN}, {CAA'P x PA'}, with their Idles $|\Leftarrow|$.

THE SYSTEM [The Three-Pole-Rotation-Squares] of the Infinite **Reciprocal and Changeable-Squares**

With their **Square-Prisms**, IS ANALOGOUS TO THE SYSTEM, [The Physical –Charges - Magnet]

And **CA x CP = CAA'P** Square is Double the area of, **CB x CO = CBAO** Unit - Square. i.e.

{CBAO x PA} $\equiv |Q_x \rightrightarrows| \cdot |AK_A|$, {CMNH x PN} $\equiv |Q_x \rightrightarrows| \cdot |Q_y \uparrow| \cdot |AK_A|$, {CAA'P x PA'} $\equiv |\Leftarrow Q_y| \cdot |AK_A|$, or

Physical Energy-Vectors-Square-Prisms, $|\oplus \rightrightarrows| \cdot 2r^2 \equiv 2\bar{q}_0 \cdot r^2$, $|\oplus \rightrightarrows| \cdot \pi \cdot r^2 \equiv \pi \cdot \bar{q}_0 \cdot r^2$, $|\oplus \rightrightarrows| \cdot 2 \cdot r^2 \equiv 4 \cdot \bar{q}_0 \cdot r^2$

Are Identical to The Geometry Square-Prisms as, $PA[\sqrt{2} \cdot r]^2 \equiv x^3$, $PN[\sqrt{\pi} \cdot r]^2 \equiv \sqrt{\pi} \cdot x^3$, $PA'[\sqrt{4} \cdot r]^2 \equiv 2x^3$

where **Energy-cube** $PA'[\sqrt{4} \cdot r]^2 \equiv 2 \cdot x^3$ is **Double That of Energy-cube** $PA[\sqrt{2} \cdot r]^2 \equiv 2 \cdot x^3$, And all Energy

monads are **Built At Pole P**, or. On-Physical **Three-Poles-Rotation-Squares-System**, Initial-Cube $|CB|^3$ IS

Doubled at $K_A \equiv A'$, Position as $2 \cdot |CM|^3$ i.e. **Quadrature and Duplication** are **conjugate Genesis-Procedure**

The **Electromagnetic-Wave**. Fig-53-3.

At Position K_A , Due to Current- Phase-Shift, $\phi = \pm 180^\circ$ issues an Energy Quantity $Q_x = Q \rightrightarrows \overrightarrow{AK_A} = |\leftrightarrow|$

following Charges rules, and because of Phase is Transformed To an Transverse motion $Q_y = Q \uparrow \overrightarrow{AK_A} = |\updownarrow|$.

The Electric – Current = $\frac{\text{Charge}}{\text{Time}} = i = \frac{\bar{q}}{T}$ is Produced from Electromotive-Force $\bar{F}_E = [\frac{[\oplus \rightarrow \ominus]}{r^2}] = \overrightarrow{AK_A} = V = \frac{\bar{E}}{q}$ at time T, and in the same Way, Energy $\equiv$ motion $\equiv E = \bar{q} \cdot V$ is conserved in $\overrightarrow{AK_A} = d = \lambda$, Conductor as **The Quantum-Power-Force** $\rightarrow Q_{\overrightarrow{AK_A}} = Z_{AK_A} \frac{d}{r} \equiv |\bar{e}| \times \frac{3}{3} \leftarrow$, i.e. **$|\bar{e}|$ Charge is the meter of Forces**.

At Point K_A , Energy $\equiv$ Motion changes direction, because its velocity-vector $\vec{v}$, changes direction, $\vec{v}$, and Phase-shift, $\varphi = \pm 180^\circ$. According to Energy-Conservation- Principle, This Energy $\equiv$ motion is conserved in the ONLY- EXIT which is The transverse motion as, $Q \uparrow \overrightarrow{AK_A} \equiv Q_{\overrightarrow{AK_A}}$, or as, $\uparrow \bar{F}_E \equiv \vec{v} \cdot \bar{F}_M$, or the Intensities E_E and $E_M \perp E_E$ Vectors. **Energy-Vectors** Form The Square, $\{ |Q \uparrow \overrightarrow{AK_A}| x |Q_{\overrightarrow{AK_A}}| \}$, or $[\bar{E}_E x \bar{E}_M] \equiv [EM]^2 \equiv |\bar{k}_x x \bar{k}_y|$ on $\overrightarrow{AK_A}$ Conductor-Direction, *Perpendicular To Energy-Square*, which is the **Energy-Square-Prism** $\{ [EM]^2 \cdot \overrightarrow{AK_A} \}$, and is Equal to The **Energy-Sphere** $\{ k \cdot \pi r^3 \} \equiv Q \cdot \overrightarrow{AK_A} \Rightarrow |\frac{\lambda}{r}|$, with max-circle $2r$, where $\rightarrow [EM]^2 = \pi \cdot r^2 \leftarrow$. From Total Work $W = 2L = \bar{B} \cdot \bar{w} = J \cdot w^2 \equiv h \cdot f_n$, implies that EM-Waves occupy $2L$.

For Electromagnetic Waves $\bar{E}_E = \bar{E}_0 \cdot \sin[kx - wt]$, $\bar{E}_M = \bar{E}_0 \cdot \sin[ky - wt]$ because Electric and Magnetic fields are Perpendicular each other so their Square, $\bar{E}_0 x \bar{E}_0$, is Perpendicular to the direction of Propagation. Again w = The angular frequency, k = The Magnitude of the Wave-Vector related to Wavelength $\lambda = \frac{2\pi}{k}$,

c = the Speed of Propagation as $c = \frac{w}{k}$, and $w = ck$, and as before. Its Energy $[\bar{E}_E x \bar{E}_M] = k = 2L$

For Elementary-Forces EM-Waves $|Q_{\overrightarrow{AK_A}}| = \bar{Q}_0 \cdot \sin[kx - wt]$ and $|Q \uparrow \overrightarrow{AK_A}| = \bar{Q}_0 \cdot \sin[ky - wt]$ are the same To Electromagnetic Waves, i.e. **of the same nature**. Because Charges $\oplus, \ominus$ at Positions, $K_A \rightarrow A$, occupy Zero Speeds Need acceleration force to Attack and so, **The accelerated-Charges Radiate Electromagnetic-Waves**,

So, Everything consisted of **motion**, and **Reaction** to This motion, executes **Vibration** resulting To a **Wave-motion**. Since equation (1) **issues for all Vibrations**, Therefore **Elementary-forces are of Electromagnetic-nature**. Vibrations of Potential Energy E_U are in **Magnetic-Storages-Fields** and Vibrations of Kinetic-Energy E_K are in The **Electric-Storages-Fields** and issues for **Physical Anti Quadrature**, The Conversion of The-Moving-Energy **Square Prism** $|Q_x \cdot Q_y| \cdot |AK_A| \equiv PN \cdot [\sqrt{\pi} \cdot r]^2$ $|k_x x k_y| \equiv |\bar{E}_E = \leftrightarrow |x| \bar{E}_M = \uparrow |x| \lambda| \rightarrow$ **To An-Movable -Equal Energy-Sphere Cone** $\equiv \textcircled{C} k \cdot \pi \cdot r^3 \leftarrow$
Examples :

A... Positions and moles : From **Material-Geometry** [24-58], Space $\equiv$ The monad 1, and Anti-Space $\equiv \sqrt{1} = +1, -1$, and $\sqrt{-1} = i$ = The Imaginary Part into The $\rightarrow$ **Anti-Space + Space $\equiv$ motion $\equiv i \equiv \sqrt[2]{-1} \equiv \sqrt[4]{-1} \equiv e^{-i \cdot (\frac{\pi}{4}) \cdot b} = 0,707106781 \cdot b$** , where b , is the base of logarithm.

The Base b , which for Natural logarithms issues $\ll$ The Natural logarithm $\ln(x)$ of a Magnitude x , is the Power to which, e , would have to be raised to equal $x \gg$ and Defining That $\rightarrow \ln(x)$ is the Period-needed to Grow, x , as this is in Integration $\int x$, while e^x is the **Amount of Growth** after **Period x** , and the Possible Repetitive-Permutations for moulds and elements which is $\rightarrow$ **Mould^{Elements} = The -Growth-Periods** i.e. When Mould = Elements Then is succeeded maximum and for e is e^e , and any $\log_x x$. For $\log_x x$ and Base $x = 10$, then $\log_{10} 10 = 10^{10}$ and for the Two elements $[\oplus, \ominus]$ is $10^{[10]^2} = 10^{20}$ **Positions $\equiv$ Distances**.

The Elements $\rightarrow$ are The maximum number of **n**, **Digits** in Material-Point and which are, **3**, [1 Positive $\oplus$ and 1 Negative $\ominus$] consisting The third $\rightarrow$ Unit-M-P $\equiv [\oplus \leftrightarrow \ominus]$ from, $\oplus, \ominus$ }.

The possible Repetitive-Permutations for moulds and Elements are **Mould^{Elements} = m^2** , for every mould, so the **Available –Extrema-Positions for each mould is $2m^2$** , and from Prior $2 \cdot 10^{[10]^2} = 2 \cdot 10^{20}$. The Un-dimensional Unit-Base of the Three Elements is $\rightarrow n \cdot b = 3 \cdot 10 = 30$, so

The Number of Positions of Any cave is N = $\frac{\text{Total-Available Positions}}{\text{Unit-Base-Elements-Pos}} = \frac{2 \cdot 10^{20}}{30} = 6,666 \cdot 10^{18} \dots (T-P)$

Relation (T-P) is The Coulomb max-electron Number as Avogadro's number N_{AV} , i.e. **The mole**, which is a **Quantity $\equiv$ Positions for Anything**, that has the same Number of Particles found in Any cave r .

Examples :

- a).. The Total charge of 1.10^{10} electrons = $\mathbf{Q_{elec}} = (1.10^{10}).(-e) = (1.10^{10}).(-1,6022.10^{-19}) = N_n$
 $-1,6022.10^{-9} \text{ C} = -1,6022.10^{-3} \mu \text{ C}$.
- b). When are Placed $6,666.10^{18}$ electrons in $\mathbf{r}$, then $\mathbf{Q_{Positions}} = (6,66.10^{18}).(-e) = 6,66.10^{18} (x)$
 $(-1,6022.10^{-19}) = -10.10^{-1} = -1 \text{ C} = N_{T-P}$, which is the definition of 1 Coulomb.
- c). **The Avogadro - mole** for Any Particle is $\mathbf{N_{Avoga}} = 6,02.10^{23}$ Number of these Particles, and
moles in Caves-Total-Positions (T-P) is $\rightarrow \mathbf{m_{T-P-mol}} = \frac{N_{TP}}{N_{AV}} = \frac{6,66.10^{18}}{6,02.10^{23}} = 1,1073.10^{-5} \text{ moles}$.
- d). Charges $\mathbf{q}$ (1- Coulomb 1C) are stored in **moles $\equiv$ Positions** as are The Capacitors (1-Farad 1F) under a required Voltage (1-Voltage 1V). To Store a Charge of $q = 6 \times 10^{-5} \text{ C}$ on the Plates of an Capacitor $C = 5\text{-}\mu\text{F} = 5 \times 10^{-6} \text{ F}$, the required Voltage V , between The Plates must be $\rightarrow V = \frac{q}{C}$
 $= V = \frac{6 \times 10^{-5} \text{ C}}{5 \times 10^{-6} \text{ F}} = 12,00 \frac{\text{C}}{\text{F}} = 12 \text{ V}$ a relation between Charge q , Voltage V , and Capacitance C .
- e). Electric-Forces $\mathbf{F_E}$ are stored in **moles $\equiv$ Positions** as are The Electric-Fields $\mathbf{E_f}$, and follow the Material - Geometry Rules as the Quaternion $\mathbf{Q_{1\oplus \rightarrow 2\ominus}}$, which carries $\oplus$ charge from Point 1, to $\ominus$ charge at Point 2. Since Forces are Vectors, Electric- Lines do not cross one another But follow Vectors rules and in case of Zero-Initial-velocity of an Particle, acceleration $\mathbf{a}$, follows Centripetal $\mathbf{a_c} = \frac{v^2}{2r}$, and the analogous Force $\mathbf{F_c} = m.a_c = \frac{m.v^2}{2r}$. This Force $\mathbf{F_c}$ is Stored in the Produced by the charges, $\oplus \rightarrow \ominus$, Electric-Field $\mathbf{E_f} = \frac{F_c}{q} = \frac{m.v^2}{2r.q}$.

In this [mole $\equiv$ Positions $\equiv$ Electric-Field $\mathbf{E_f}$] are Stored The Forces, *which are created between Charges* which Electric-Force is *The Dominant where Particles are responding To the Constructive* $[\oplus \rightarrow (+) \leftarrow \oplus]$ or To $[\ominus \rightarrow (+) \leftarrow \ominus]$, and To Destructive $[\oplus \rightarrow (-) \rightarrow \ominus]$ Interference. (Page-75)
 The *Coulomb-Force* acting between Two Particles of Diameter-distance $2d = r$ is $\rightarrow \mathbf{F_c} = C \frac{q_1.q_2}{r^2}$.

It is easily seen and proved That for map-configurations $\begin{matrix} + & 0 & + \\ + & - & 0 \\ 0 & 0 & 0 \end{matrix}$ issues $r^2 = r r = d [d\sqrt{2}] = d^2 \sqrt{2}$
 for $\begin{matrix} + & + & + \\ 0 & 0 & 0 \\ 0 & - & 0 \end{matrix}$ issues $r^2 = r r = [r + r/3].[r\sqrt{3}/2]$ and generally, for charges on a Regular-Polygon of side $\mathbf{d}$
 in a circle of radius $\mathbf{r}$, is $r^2 = r r = h d$, where $\mathbf{h}$ = The height from one Vertices To Opposite side [63]

B...FORCE, means the Interaction between Two, $[\oplus]$, $[\ominus]$, Charges in Sub-Space of STPL – Mechanism. .
Duality - Photon $\rightarrow \{ \bar{c} . \bar{f}_n \} + \{ c . f_n \} \leftarrow$ Is An Stationary - Storage in Standing-Wave + an Travelling -Wave
 i.e. $\rightarrow$ Particle + Wave $\leftarrow$ and so *issues that Force $\mathbf{F}$ is The Space, Anti-Space influence of the, $[\oplus] \leftrightarrow [\ominus]$,*
 Charges at the Two-Positions of monad [Store = $\bar{f}_n$] and Wavelength $\lambda = 2r = c / f$. The Two Positions of Wavelength λ , follow all laws of Mechanics and the Cauchy-Stresses of Elasticity.

From Lorentz-Force $\mathbf{F} = q \bar{v} \times \bar{B}_F = q.[E - v B]$, where $\mathbf{q}$ = charge, $\mathbf{E} = F/q$ The Electric field
 Point charge $\mathbf{Q_e} = q(-e) = -1,6022.10^{-19} \text{ C}$, $\bar{B}_F = E / c$ the Magnetic field and for current in loops r ,
 $\bar{B}_F = I / 2\pi (2r)$, **And for $\mathbf{F} = 0$** Then $E = v B$. **For $\mathbf{F} \perp q \perp v$** it is The Newton Centripetal Force
 $\bar{F}_c = m v^2 / r$ and Then $\frac{m.v^2}{r} = q v B$ or $m v = q r B$, **And Spin $\mathbf{S} = m v r$** . Equating the Three cases
 Then $S = m v r = (q r B) r = q r^2 B$, **or $\mathbf{S} = q r^2 B$ and $q B = \frac{S}{r^2}$** , or from $\bar{F}_c = F = q v B = \frac{v.S}{r^2}$
i.e. An relation between Force $\mathbf{F}$, on any Charge $\mathbf{q}$. of an Magnetic field $\mathbf{B}$ of cave r , and The Spin $\mathbf{S}$.

This Nutation-Force $\mathbf{F} = [\frac{\bar{v}.S}{r^2}]$, and found from Common Charge $\bar{q} = \mathbf{Q_+} = [\frac{g.S}{2\pi r^2}]$, which originates
Forces $\mathbf{Q_{S-W}} = [\frac{c.S}{r^2}] = \frac{2,9987.10^8.[5,691952.10^{-34}]}{r^2/4} = 6,8273824.10^{-25} [\frac{1}{r^2}] \text{ eV} \dots\dots (\text{Forces})$

or The **Border-line of Weak –Strong - Forces** is $\rightarrow \bar{q}_{\text{Weak-Strong}} \equiv 6,8274.10^{-16} \text{ GeV} \leftarrow$
 meaning that Weak-Forces $\{W^\mp, Z^0, W^\pm\} \geq 6,8274.10^{-16} \text{ GeV}$ and
 Strong-Forces $\{Q^\pm, C^{+0-}, D^\mp\} \leq 6,8274.10^{-16} \text{ GeV}, 10^8$,

From **Lorentz-force** $\mathbf{F} = q \bar{v} \times \bar{B}_F$, Voltage $\mathbf{V}$ or Electric-Potential $\mathbf{V} = q / (C = A / d)$ and in $d = 10^{-16} \text{ m}$
 $\mathbf{V} = k [q / r] = \frac{2[6,022]10^{-19}.1C}{10^{-16} \text{ m}} = 12.10^{-3} \text{ Volt}$, in Electric-field $\mathbf{E} = \frac{\Delta V}{d} = \frac{12.10^{-3} \text{ V}}{2.10^{-16} \text{ m}} = 6.10^{12} = \frac{V}{m}$, Force
 $\mathbf{F} = q E = 1,6022.10^{-19}.[6.10^{12}] = 9,613.10^{-7} \text{ N}$, and Work $\mathbf{W} = F d = 9,613.10^{-7} 10^{-16} = 9,613.10^{-23} \text{ J}$.

Voltage $\mathbf{V} = h f = F / c = q V$ in cave $\mathbf{r}$, as $\rightarrow \mathbf{V} = \frac{hf}{eV} = \frac{h}{eV} \sqrt{\frac{g}{r^3}} = \frac{6,62606957.10^{-34}}{[1,602.10^{-19}].\sqrt{r^3}} = 4,1356586.10^{-15} \sqrt{\frac{g}{r^3}}$

All Particles and Forces End in, STPL - Pascal's, $\mathbf{P_A}$, and Desargues's Points, $\mathbf{D_A}$, where $\mathbf{AK_A}$
Conductor Creates The Strong-Force, $\bar{Q}$, $\bar{C}$, $\bar{D}$, and $\mathbf{AK_B}$, $\mathbf{AK_C}$ Create the-Weak-Force $\mathbf{W^\pm}$, $\mathbf{Z^\pm}$.

The Why Wave -Birefringence is related to Particles-Chromodynamics Forces $\bar{Q}$, $\bar{C}$, $\bar{D}$, Fig-46.

The derivation of any two waves is as $W_1 = A.\cos(kx - wt)$, $W_2 = A.\cos(kx - wt + \varphi)$ and by

$$\text{Summation } W_1 + W_2 = A.\cos(kx - wt) + A.\cos(kx - wt + \varphi) \equiv 2.A.\cos\left(\frac{\varphi}{2}\right).\cos[kx - wt + \varphi/2]$$

Constructive - Interference happens If the Phase difference is an Even multiple of φ , or

$$\varphi \rightarrow -4\pi, -2\pi, 0, 2\pi, 4\pi, \dots, 2N\pi, \text{ and or } \rightarrow \mathbf{W}_C \equiv \mathbf{W}_1 + \mathbf{W}_2 = 2\mathbf{A}.\cos[\mathbf{kx} - \mathbf{wt}] \leftarrow \text{and}$$

Destructive - Interference happens If the Phase difference is an Odd multiple of φ , or

$$\varphi \rightarrow -3\pi, -\pi, 0, \pi, 3\pi, \dots, (2N-1).\pi, \text{ and or } \rightarrow \mathbf{W}_D \equiv \mathbf{W}_1 + \mathbf{W}_2 = 0$$

From, **Physics of waves**, Birefringence is a Phenomenon in which a ray of Light Passing through a given material experiences Two Refractive indices, n_1, n_2 , The relative magnitude of the Refractive indices is Proportional to the difference of the **Principal - Strains**, and consequence to Stresses as $\rightarrow \delta = d [n_1 - n_2] \dots(1)$ where, d , is the thickness of the material, and when a ray of light, of wavelength λ , and Electromagnetic components R_1, R_2 , Passes through an cave, r , then Intensity $\rightarrow I = \sqrt{[R_1^2 + R_2^2]}.\sin^2\left(\frac{\pi\delta}{\lambda}\right)$, and when $I = 0$, then, $\sin^2\left[\frac{\pi\delta}{\lambda}\right] = 0$. i.e. when $\delta = 0, \delta = 1, \delta = 2$, or generally $\delta = N$, where $\epsilon_1 - \epsilon_2 = \delta/2r.k = r [n_1 - n_2]$, and the **Relative Retardation**, $\delta = N\lambda = r.\cos\varphi$, where, $\varphi = 0 \approx 90^\circ$, or, $\delta = r$, $\delta = \pi r / 2 \dots(2)$

Primary-Particles are considered Spherical, so **Merging** happens on Semicircle - clips, $\rightarrow \subset \rightarrow$, and on the Anti -Semicircle the Opposite as $\rightarrow \supset \rightarrow$. In both cases, $\delta = N\lambda = r.\cos[\varphi = 0 - 90^\circ]$.

In case of a **Constructive**-Interference then merging, $\oplus \rightarrow \oplus \equiv \oplus \rightarrow [\subset \oplus] \equiv \oplus \rightarrow (\delta \oplus) \equiv \oplus (\cos\varphi.r \oplus)$

In case of a **Constructive**-Interference merging is, $\ominus \rightarrow \ominus \equiv \ominus \rightarrow [\supset \ominus] \equiv \ominus \rightarrow (\delta \ominus) \equiv \ominus (\cos\varphi.r \ominus)$

In both cases Energy $E = hf \equiv h/T \equiv hc/\lambda$, and $\lambda = \delta/N$ so energy $E = hNc/\lambda \dots\dots(3)$

From (3) is seen that the Number of colors is infinite because, $N=1 \rightarrow \infty$, and so the Color is a form of Strong charge. From Voltage $V_r = F_c.r = \lambda r$, where, $\lambda = c/f$ and which is The wavelength.

The Duality Photon and Electromagnetism :

Electromotive-Force $\rightarrow \mathbf{F} = \bar{q} \bar{v} \times \bar{B}_F = \mathbf{Q}_{\pm A} \rightarrow = \frac{v.\bar{S}}{r^2} \equiv \left| \frac{c.\bar{S}}{r^2} \right| \equiv \mathbf{G}$, **The Elementary-Particles** $\leftarrow \{\text{Forces} = F$

Leptons = L, Quark = Q}. Because Charges oscillate in the **Inner - Connectors** $\equiv$ **Conductors**, therefore, **Electromagnetic-Forces** become from the Oscillation of, $\oplus$, $\ominus$ **Charges in caves**, **Short-Range-Forces**,

Proportional to the Positions these occupy in caves, $\bar{q}_{\text{Electron}} = \frac{G}{c\sqrt{2}}$, $\bar{q}_{\text{Cave}} = \frac{S.g}{\sigma.r.\Phi} \equiv \frac{\bar{S}.g}{\bar{c}.r}$ while for the Outer

Tangential-Connectors become the **Electromagnetic-Forces**, **The Long-Range-Forces**, The **Gamma-ray** γ .

From above is seen The How **Duality-Photon-Energy** is working. $E = \bar{c}.\{\bar{f}_n\} + f_n\}$ and from **Stress** σ

$\rightarrow \sigma = \left[\frac{2\pi r}{\Phi^2}\right].f_n = \left[\frac{2\pi r}{\Phi^2}\right].\{\bar{f}_n\} + f_n\} = \left[\frac{2\pi r}{\Phi^2}\right].\bar{f}_n + \left[\frac{2\pi r}{\Phi^2}\right].f_n \equiv \text{Storage} + \text{Information}$ and it is **The Way**

of Energy-Storage and Stress-Information in Nature. In **Quaternion** with Real and Imaginary Part, **Energy Acts only on the Resultant-Direction End-Points**, Carrying Energy from One-Edge to another

Edge, and unveils Cosmic-Particles-Origination as frequency $f_n = v/2\pi r = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\sigma.\Phi}{2\pi.r_n}$, i.e.

The Stresses become from a Force and a Surface as equation $\sigma = \frac{F}{A} = \frac{\text{Force}}{\text{Area}}$, and in the case of the

Gravitational constant G and a Spherical-cave r, then $\sigma = \frac{G}{4\pi r^2} = \frac{G}{\pi(2r)^2} = \frac{G}{\pi s^2} = \frac{G}{\pi \lambda^2}$, or vector $\bar{s} = \lambda = 2r$.

Above relation means that **Force G needs a Vector-surface $\pi.s^2$, or a circle**, to be spread as **Stress σ** and it is the case of **Constant-light-velocity c**, Wavelength λ , which is for **The first Surface**.

Force G $\rightarrow$ on Spinning M-Points, $\bar{S}$, through $\bar{g} \rightarrow$ and Planck's momentum $\bar{B} \rightarrow$ on $\mathbf{g}_G$ through $\mathbf{f}_R$

$G = \sigma \Phi^3$, and Stress $\sigma = \frac{G}{\Phi^3} = \frac{G.\sigma^3}{c^3}$, or $\rightarrow \sigma^2 G = c^3 \dots\dots(e)$, where σ is a Stress between frequencies.

From Force-relation $\mathbf{F} = \sigma A = (2\pi f r) \frac{A}{\Phi} = wr \frac{A}{\Phi} = \bar{v} \frac{A}{\Phi}$, is seen also force G becomes velocity $\bar{v} \rightarrow \bar{c}$.

In the case of Planck's-length velocity $\bar{c} = wr = \frac{\sigma.\Phi}{r} r_p = \sigma \times \Phi = \left| \frac{G.L_p}{r.\Phi^3} \right| \Phi = \left[\frac{G.L_p}{r.\Phi^2} \right]$ and from relation

$G \equiv \sigma \times \Phi^3$ then $\rightarrow [\bar{c} = \frac{G.L_p}{r.\Phi^2}]$ which is the **Light-velocity vector**. Since r, becomes from the Beyond

Planck's-Region then $\rightarrow \bar{v} = \frac{F.\Phi}{A} = \left[\frac{G.\Phi}{A} \right] \dots(f)$ Equation (f) may be written as Force $G = \bar{v} \frac{A}{\Phi}$, which

is a **Viscus - Damping-Force** where $\frac{A}{\Phi}$ is a constant of Proportionality and from equation of motion is

$$F_G = \left[\frac{A}{\Phi} \right] . \dot{x} . \text{ and then } \rightarrow [\bar{c} = \frac{G.r}{\Phi^2 L_p}] \leftarrow (3-d, 4-d) \text{ which is Light-velocity In } L_p.$$

For the **Out-Planck's-length** velocity equation $\bar{v}_m = \mathbf{N} \cdot \bar{\mathbf{c}} \cdot \{ \bar{\mathbf{f}}_n + \mathbf{f}_n \}$ and from equation $\bar{v}_m = w r = \mathbf{N} \cdot \pi \cdot \mathbf{c}$, $f = [\frac{n \cdot c}{2r}]$, then $\rightarrow \bar{v}_m = \mathbf{N} \cdot \bar{\mathbf{c}} \cdot \{ \bar{\mathbf{f}}_n + \mathbf{f}_n \} \equiv \mathbf{n} \cdot \bar{\mathbf{v}} \{ | \frac{\bar{c}}{\lambda_l} | (n + \frac{1}{2}) + | \frac{n}{2\lambda} | \} \leftarrow$ **which is Light-velocity Out L_p** .

Photon was Proved to be a Material-Point in cave r , where its **Inner Storage** is *The Standing-Stationary Wave* The Electromagnetic-Wave $[E^2 + H^2] = 2\lambda \sin[kx] \cdot \cos[wt]$ with n Lobes representing the **Normal mode Vibration** with frequencies $f_n = n \cdot f_1 = \frac{E}{h} = \frac{n \cdot v}{4r} = \frac{n\sigma}{2\pi r} [1 + \sqrt{5}] = \frac{n \cdot \sigma \Phi}{2\pi r}$, and **Outward the Storage**

Is the Propagating Electromagnetic - Wave. $\rightarrow \{ [\epsilon E^2 + \mu B^2] = 2 \cdot \lambda \cdot c \cdot \sin.2\phi \} \leftarrow$

Elementary Forces :

Electromotive-Force in the min-cave $e^{-15,572707} = r = 1,7252787 \cdot 10^{-7}$ m. is the Gravitational-Force G , as

$$Q_{\pm} = | \frac{c \cdot \bar{S}}{r^2} | = \frac{[2,998 \cdot 10^8] \cdot [6,62606957 \cdot 10^{-34}]}{(1,7252787 \cdot 10^{-7})^2} = 6,673692 \cdot 10^{-11}, \text{ which is the G-Physical-Force-Charge.}$$

From magnetic-force $\bar{B}_F = \bar{Q}_F = \frac{\bar{S}}{q \cdot r^2} = \frac{5,691952 \cdot 10^{-34}}{1,602 \cdot 10^{-19} [r]^2} = 3,5092182 \cdot 10^{-15} \cdot | \frac{1}{r^2} |$, **Quantity** $3,5092182 \cdot 10^{-15} \text{ eV}$ is The **Border-line** between Strong Quantum-Chromo Dynamic, $Q^{\pm}, C^{\mp 0}, D^{\mp}$ and Weak-forces, $W^{\mp}, Z^{\pm 0}, W^{\pm}$, P-69

The **Weak Force W^-** in System is the Coulomb's Force $\rightarrow [e^- v_e] \equiv [-1 \cdot 0 + W^-]$ which may be calculated from the Time needed, for Harmonic-mass to vibrate in Magnetic-cave r_B , following the Energy equation $r_B = \frac{m \cdot v}{q \cdot B} = \frac{[3,919 \cdot 10^{-36} \text{ Kg}] \cdot [2,9978 \cdot 10^8]}{1,6022 \cdot 10^{-19} \cdot [0,4121237 \cdot 10^6]} = 17,792361 \cdot 10^{-15} \text{ m}$, and for Weak Force W^- in cave $d = 10^{-15} \text{ m}$, then Period

$$T = \frac{d}{c} = \frac{17,792361 \cdot 10^{-15} \text{ m}}{[2,998 \cdot 10^8 \text{ m/s}]} = 5,9351394 \cdot 10^{-23} \text{ s}, \text{ and The Produced Energy in } d, \text{ is } E_{W^-} = \frac{h}{T} \text{ or,}$$

$$E_{W^-} = \frac{1,055 \cdot 10^{-34} \text{ J} \cdot \text{s}}{2 \cdot [5,9351394 \cdot 10^{-23} \text{ s}] \cdot [1,602 \cdot 10^{-19} \text{ J/eV}]} = 5,5472 \cdot 10^6 \text{ eV} \equiv 5,55 \text{ MeV}, \text{ and because from Coulomb-Force}$$

$$F_C = \frac{C \cdot Q}{r^2} \text{ and } V_C = \frac{C \cdot Q}{r}, \text{ then issues } \rightarrow \text{Weak-Force } W^- = [\frac{E_{W^-}}{r_B}] = \frac{5,5472 \cdot 10^6}{17,792361 \cdot 10^{-15}} = 3,1177424 \cdot 10^{20} \text{ eV},$$

$$\text{so the Weak-Force is } W^- = [\frac{h/T}{2 \cdot r_B}] = [\frac{h \cdot c/d}{2 \cdot r_B}] = \frac{h \cdot c}{2 \cdot d \cdot r_B} = | \frac{h \cdot c}{2 \cdot e \cdot r_B^2} | \text{ eV} \dots (w-f) \quad [P-82]$$

$$\text{While from Neutron-mass-System [P-84]} \quad r = \frac{m \cdot v}{q \cdot B} = \frac{[3,3425529 \cdot 10^{-30} \text{ Kg}] \cdot [2,9978 \cdot 10^8]}{1,6022 \cdot 10^{-19} \cdot [409 \cdot 10^9]} = 1,52911 \cdot 10^{-14} \text{ m}$$

$$W^- Z^0 \equiv [\frac{h/T}{2 \cdot r_B^2}] \equiv [\frac{h \cdot c/d}{2 \cdot r_B^2}] \equiv \frac{h \cdot c}{2 \cdot d \cdot r_B^2} \equiv [\frac{h \cdot c}{2 \cdot e \cdot r_B^2}] \text{ eV} = \frac{1,055 \cdot 10^{-34} \text{ J} \cdot [2,998 \cdot 10^8 \text{ m/s}]}{2 \cdot [1,602 \cdot 10^{-19} \text{ eV}] \cdot [1,52911 \cdot 10^{-14}]^2} = 4,22141 \cdot 10^{20} \text{ eV}.$$

For **Elementary Particles**, Total-Energy of an Elementary-Particle $\equiv$ Intrinsic Rotational + Kinetic Energy, and from Relation $B = r m v = S = \text{Spin}$ and $m = \frac{B}{r \cdot v} = \frac{B}{r \cdot w r} = \frac{B}{r^2 \cdot w} = \frac{S}{r^2 \cdot w} = \frac{\pi r^2}{2}$ then Centrifugal-Energy is

$$E_K = \frac{m}{r} v^2 = \frac{v^2}{r} [\frac{S}{r^2 \cdot w}] = \frac{w^2 r^2 S}{r \cdot r^2 \cdot w} = \frac{w \cdot S}{r} = \frac{2 \pi f \cdot S}{r} \equiv \frac{2 \cdot S^2}{r^5} = \frac{c \cdot S}{r^2}, \text{ and The Complex-frequency which}$$

is applied for the, **Beyond-Cosmic-Particles-Region**, become The **Quantized-Charge-Forces**,

$$Q_{AK_A} = \frac{\bar{x}}{H(w)} = [-i \cdot 2k\zeta] \equiv - (\frac{\bar{c} \cdot S}{r^3}) \cdot \{ \pm \frac{3}{3} [AK_A], \frac{2}{3} [AK_A], \frac{1}{3} [AK_A] \}$$

In Fig-30 the, $\oplus, \ominus$, charges Interact each other through the Inner-Connectors for Stability. The motion of the $\oplus$ constituent to the $\ominus$ constituent creates Work from the Coulomb Force F_C , and Connector, d , equal to Inner Connectors in, **Conductors $\equiv$ Displacements r** , where $\rightarrow r = AK_A$ and Interference $k = \frac{c^2 [\oplus d \ominus] = \bar{c}^2 d}{4\pi^2} = \frac{\bar{c}^2 d}{4\pi^2}$

B.. THE DUPLICATION OF THE CUBE , In Geometry and Mechanics :

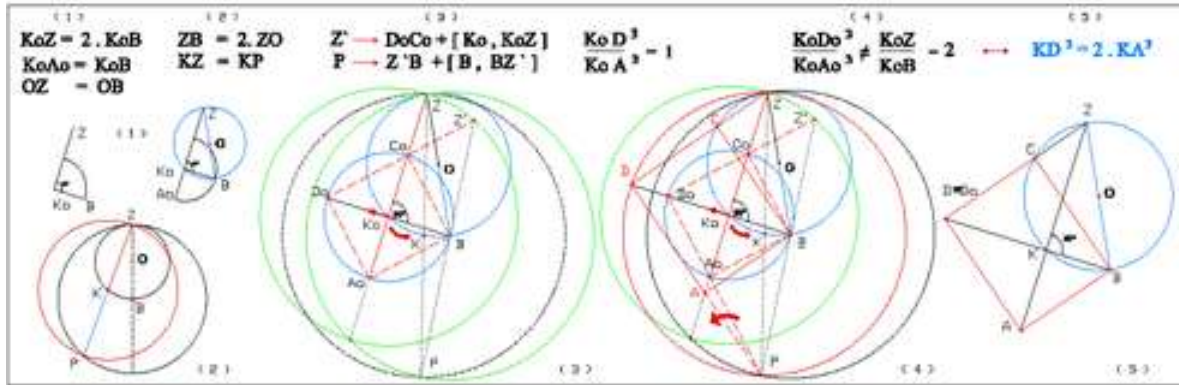
The Duplication of the Cube, Or The Problem of the Two – Mean - Proportionals, The Delian Problem.

The Extrema method for the Duplication of the cube in [44-45]

This Problem is in Three dimensions as this first was set by Archytas Proposed by determining a certain Point as the intersection of Three surfaces, *a Right Cone, a Cylinder, a Tore or anchoring with inner diameter nil*. Because of the Three master - meters where there is holding *The Ratio of Two or Three Geometrical magnitudes*, is such that they have a linear relation (continuous analogy) in all Spaces, The solution of this Problem, as well as *That of Squaring The circle*, is linearly transformed. The solution is based on the known $\rightarrow$ Two locus of a linear motion of a Point. The Geometrical construction Step – By – Step, is in F-54: The Presentation of the method on D r - Geo machine for macro constructions in F.55.

The Geometrical-solution of this Problem is On-Purpose of better understanding The Quadrature, because

Is seen and Proved That it is , **The Projection of the first** . The **Unit - Energy-Quantum** $|Q_x \cdot Q_y| \cdot |AK_A| = E$
 $\equiv Z_{AK_A} \frac{d}{r} \equiv |\vec{e}| \times \frac{3}{3} \equiv \text{Square-Prism}$ for $\frac{d}{r} = \frac{1}{3}, \frac{2}{3}, \frac{3}{3}$ and equal to The **Energy-Sphere Cone** $\equiv \mathbb{C} \cdot k \cdot \pi \cdot r^3$.
 Above issue On the Same Conductors $K_0 Z \perp 2 \cdot K_0 B$, as in Quadrature $K_0 Z \perp \cdot K_0 Z$ where $K_0 Z = 2 \cdot K_0 B$.
 The Initial Energy-Cube CA^3 , in The-Physical-Conductor $[AK_A]$, becomes **An** Equivalent Circular-Pyramid ,
 Through **Anti-Quadrature** , **An** Energy Unit-Sphere $\frac{4\pi}{3} r^3$, at K_A Edge-Point and **An** Energy Doubled Volume



as $2L = \bar{B} \cdot \bar{w}$, in The Opposite direction of Conductor $\overline{K_A A}$ becoming **The Double-Unit-Sphere 2** . $\{ \frac{4\pi}{3} r^3 \}$.
Figure – 54. The Mechanical Extrema Constant-Poles Z, K, P, of Rotation in circumcircles of Triangle ZK_0B .

- 1.. Draw on Any Orthogonal - System $K_0 Z \perp K_0 B$, Segment $K_0 Z = 2 \cdot K_0 B$ and on BZ as Hypotynousa the circle $(O, OB = OZ)$.
- 2.. Draw on $K_0 Z$ Produced $K_0 A_0 = K_0 B$ and form the Square $B C_0 D_0 A_0$, .
- 3.. Draw the circles $(K_0, K_0 Z)$, $(B, B Z)$ which are intersected at Points Z, A_e , and , $D_0 C_0$ Produced at Point Z' , and $D_0 A_0$ Produced at Point P .
- 4.. Draw on ZP as diameter The circle $(K, KZ = KP)$ intersecting $K_0 D_0$ Produced at Point D and Join DZ, DP intersecting the circle (O, OZ) and line $K_0 A_0$ Produced at Point A .
- 5.. On Rectangle $BCDA$, The Cube of Segment $K_0 D$ is twice the Cube of Segment $K_0 A$ and , exists $K_0 D^3 = 2 \cdot K_0 A^3$, which is , **The Duplication of the , $C_0 A$, Cube** .

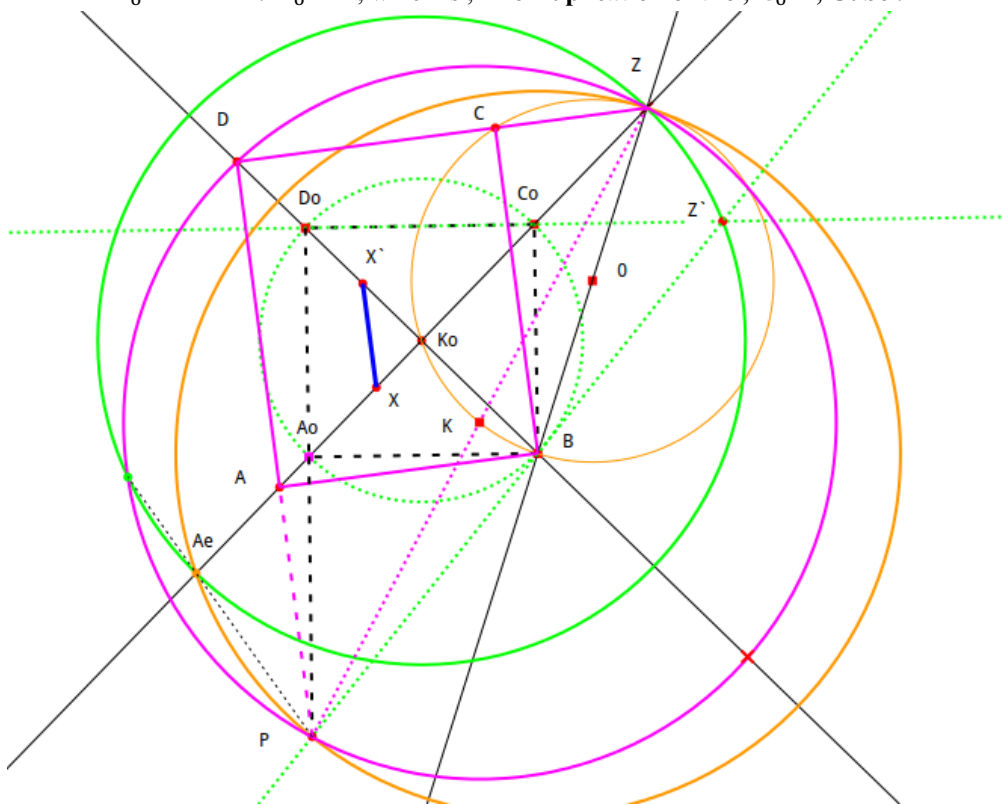


Figure –55. Presentation of the Duplication Method on Dr. Geo - Machine Macro - constructions

$B C_0 D_0 A_0$, Is the initial Basic Quadrilateral , Square , on $K_0 Z$, $K_0 B$ Extrema - lines mechanism .
 $BCDA$ is the In-between Quadrilateral , on (K, KZ) Extrema-circle ,and on $K_0 Z - K_0 B$, Extrema
 lines of common Poles Z, P , mechanism . The Initial Quadrilateral $B C_0 D_0 A_0$, with Pole -
 lines $D_0 A_0 P - D_0 C_0 Z'$, **Rotates** Through Pole P , and the movable Pole Z' on $Z'Z$ arc ,
To The → Extrema Quadrilateral $BCDA$ Through Pole- lines $DAP - DCZ$ with Point D_0
 sliding on $BK_0 D_0$ Pole - line . The Final Position of this Rotation – Translation is The
 Quadrilateral $BCDA$ where issues $K_0 D^3 = 2 . K_0 A^3$

2.1. The Processus of The Duplication of Cube : F.53 , F54 , F.55

1.. Draw Line segment $K_0 Z$ to be Perpendicular to its half segment $K_0 B$ or as $K_0 Z = 2 . K_0 B \perp K_0 B$
 and the circle $(O, BZ/2)$ of diameter BZ . Line -Segment ZK_0 Produced to $K_0 A_0 = K_0 B$ (or and
 $K_0 X_0 \neq K_0 B$) is forming the Isosceles right-angled Triangle $A_0 K_0 B$.

2.. Draw Segments BC_0 , $A_0 D_0$ Equal to BA_0 and be Perpendicular to $A_0 B$ such that Points C_0, D_0
 meet the circle $(K_0, K_0 B)$ in Points C_0, D_0 , respectively, and thus forming the inscribed Square $B C_0 D_0 A_0$.
 Draw circle $(K_0, K_0 Z)$ intersecting line $D_0 C_0$ Produced at Point Z' , and draw the circle (B, BZ)
 intersecting diameter , $Z'B$, Produced at Point P (The constant Pole) .

3.. Draw line ZP intersecting (O, OZ) circle at Point K , and draw the circle (K, KZ) intersecting line
 BD_0 Produced at Point D . Draw line DZ intersecting (O, OZ) circle at Point C and Complete Rectangle
 $CBAD$ on the Diameters BD . Show that this is an Extrema Mechanism on where ,

The Three dimensional Space $K_0 A \rightarrow$ is Quantized to $K_0 D$ as $\rightarrow K_0 D^3 = 2 . K_0 A^3$.

Analysis :

In (1) - F.53 , $K_0 Z = 2 . K_0 B$ and $K_0 A_0 = K_0 B$, $K_0 B \perp K_0 Z$ and $K_0 Z / K_0 B = 2$.

In (2) Circle (B, BZ) with radius twice of circle (O, OZ) is **The Extrema** case where circles with
 radius $KZ = KP$ are formulated and are the locus of all moving circles on arc BK as in F53-(2) , F.55

In (3) Inscribed Square $B C_0 D_0 A_0$. Passes through middle Point of $K_0 Z$ so $C_0 K_0 = C_0 Z$ and
 since angle $\angle ZC_0 O = 90^\circ$, then Segment $OC_0 \parallel BK_0$ and $BK_0 = 2 . OC_0$.

Since radius OB of circle $(O, OB = OZ)$ is $\frac{1}{2}$ of radius OZ of circle $(B, BZ = 2 . BO)$ then , **D** ,
 is **Extrema** case where circle (O, OZ) is the **locus of the centers** of all circles $(K_0, K_0 Z)$, (B, BZ)
 moving on arc , $K_0 B$, as this was Proved in F.55.

All circles **centered on this locus** are common to circle $(K_0, K_0 Z)$ and (B, BZ) separately.

The only case of being Together is the common Point of these circles which is their Common
 Point P , where then $\rightarrow$ **centered circle exists on the Extrema Edge , ZP Diameter** .

In (4) , F54-(4) Initial Square $A_0 B C_0 D_0$, **Expands and Rotates** Through Point B , while Segment $D_0 C_0$
 limits to DC , where **Extrema Point** Z' moves to Z . Simultaneously , the circle of radius $K_0 Z$ moves to
 circle of radius BZ on the locus of $\frac{1}{2}$ chord $K_0 B$. Since angle $\angle Z'D_0 A_0 P$ is always 90° so ,
 exists on the Diameter $Z'P$ of circle (B, BZ) and is the limit Point of chord $D_0 A_0$ of the Rotated
 Square $B C_0 D_0 A_0$, and Not surpassing the Common Point Z .

Rectangle $BA_0 D_0 C_0$ in angle $\angle PD_0 Z'$ is expanded to Rectangle $BADC$ in angle $\angle PDZ$ by existing
 on the Two limit circles $(B, BZ' = BP)$ and $(K_0, K_0 Z)$ and Point D_0 by sliding to D .

On arc $K_0 B$ of these limits is **centered circle on ZP Diameter** , i.e. **Extrema** happens to $\rightarrow$
The Common Pole of Rotation through a Constant Circle centered on **$K_0 B$ arc** , and since Point D_0 is the
 intersection of circle $(K_0, K_0 B = K_0 D_0)$ which limit to D , therefore the intersection of the Common Circle $(K$
 $, KZ = KP)$ and line $K_0 D_0$ denotes that Extrema Point , where the expanding line $D_0 C_0 Z'$ with leverarm
 $D_0 A_0 P$ is **Rotating through Pole P** , and limits to line DCZ , and **Point P is The Common Pole of all**
Circles on arc , $K_0 B$, for the Expanding and simultaneously Rotating Rectangles .

In Fig-(55) Rectangle $BCDA$ formulates the Two right-angled Perpendicular Triangles

ADZ , ADB which solve The Problem.

Segments $K_0 D$, $K_0 A_0 = K_0 B$ are the Two Quantized magnitudes in Space (volume) such that
Euclidean Geometry Quantization becomes through the Mould of Doubling of the Cube .

[This is the Space Quantization of E-Geometry i.e. The cube of Segment K_0D is the Double magnitude of K_0A Cube, or monad $K_0D^3 = 2$ times The monad K_0A^3]. About Poles in [55].

The Proof : F.54-(3)-(4)-(5).

- 1.. Since $K_0Z = 2 \cdot K_0B$ Then $(K_0Z / K_0B) = 2$, and since angle $\angle ZK_0B = 90^\circ$ Then BZ is the Diameter of circle (O, OZ) and angle $\angle ZK_0B = 90^\circ$ on diameter ZB .
- 2.. Since angle $\angle ZK_0A_0 = 180^\circ$ and angle $\angle ZK_0B = 90^\circ$ Therefore angle $\angle BK_0A_0 = 90^\circ$ also.
- 3.. Since $BK_0 \perp ZK_0$ Then K_0 is the midpoint of chord on circle (K_0, K_0B) which passes through Rectangle (square) $BA_0D_0C_0$. Since angle $\angle ZDP = 90^\circ$ (because exists on diameter ZP) and since also angle $\angle BCZ = 90^\circ$ (because exists on diameter ZB) Therefore Triangle BCD is right-angled and BD is the Diameter. Since Expanding Rectangles $BA_0D_0C_0, BADC$ Rotate through Pole, P , Then Points A_0, A , lie on circles with BD_0, BD Diameter, Therefore Point D is common to BD_0 line and $(K, KZ = KP)$ circle, and $BCDA$ is Rectangle. F.53-(2) i.e. Rectangle $BCDA$ Possess $AK_0 \perp BD$ and DCZ a line Passing through Point Z .
- 4.. From right angle Triangles ADZ, ADB we have,
 On Triangle $\Delta ADZ \rightarrow KD^2 = KA \cdot KZ$. (a)
 On Triangle $\Delta ADB \rightarrow KA^2 = KD \cdot KB$... (b)
 and by division (a) / (b) then $\rightarrow \frac{KD^2}{KA^2} = \frac{KA \cdot KZ}{KD \cdot KB}$ or $\frac{KD^3}{KA^3} = \frac{KZ}{KB} = 2$

(o.e.δ),(q.e.d) i.e. $\rightarrow K_0D^3 = 2 \cdot K_0A^3$, which is the Duplication of the Cube.

In terms of Mechanics, Spaces Mould happen Through, Mould of Doubling the Cube, where for Any monad $ds = K_0A$ Analogous to K_0A_0 , The Volume or The cube of segment K_0D is Double The Volume of K_0A cube, or monad $KD^3 = 2 \cdot K_0A^3$. This is one of The basic Geometrical Euclidean Geometry Moulds, which create The METERS of monads $\rightarrow$ where Linear is The Segment MA_1 , Plane is The Square $CMNH$ Equal to the circle And in Space, is Volume $K_0D^3 = KD^3$, in All Spaces, Anti-Spaces and Sub -Spaces of monads = Segments $\leftarrow$ i.e. The Expanding Square $BA_0D_0C_0$ is Quantized to $BADC$ Rectangle by Translation To Point, Z , and by Rotation, Through Point P (The Pole of Rotation) To Point Z .

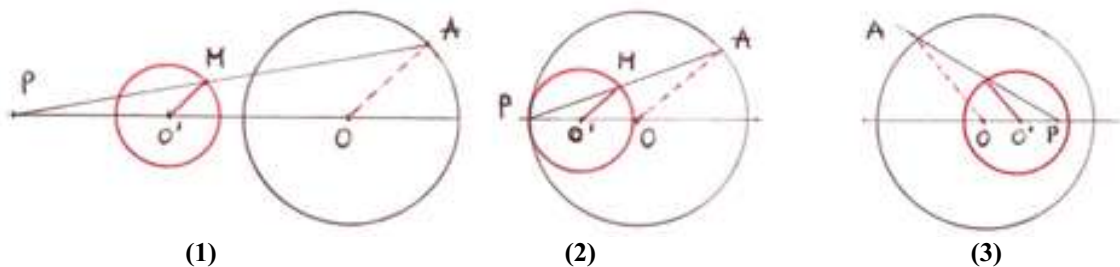


Figure –56. For any Point A On, and P Out-On-In circle $[O, OA]$ and $O'P = O'O$, exists $O'M = OA / 2$.

2.2 The Quantization of E-Geometry :

Quantization of Geometry is the How Point to be {Segments, Lines, Planes, and the Volumes}, To its Moulds.

Quantization of E-Geometry is the Way of Points to become as a $\rightarrow$ (Segments, Anti-segments = Monads = Anti-monads), (Segments, Parallel-Segments = Equal monads), (Equal Segments and Perpendicular - Segments = Plane Vectors), (Non-equal Segments and Twice-Perpendicular-Segments = The Space Vectors = Quaternion), by defining The mould of Quantization.

The Three Ways of Quantization are $\rightarrow$ for Monads = The Material Points, The Mould is the Cycloidal Curl Electromagnetic field, for Lines the Mould is that of Parallel Theorem with the least constant Distance, for Plane The Mould is the, Squaring of the circle, π , and, for Space is The Mould of the Duplication of Cube $^3\sqrt{2}$. All methods in, F- 57 as below.

In [61] The Glue-Bond Pair of Opposites $[\ominus \oplus]$, creates Rotation with angular velocity $w = v/r$,

and velocity $v = \omega r = \frac{2\pi}{T} = 2\pi f = \left[\frac{\sigma}{2}\right](1+\sqrt{5})$, frequency $f = \frac{(1+\sqrt{5})\sigma}{4\pi r}$, Period $T = \frac{4\pi r}{\sigma(1+\sqrt{5})}$ where $\pm \sigma$, are the Two Centripetal F_p and Centrifugal F_f Forces. Odd and Even number of Opposites, on a Regular Polygon, defines the Quality of Energy- monad. **When motions, B, w, are Constants** Then from Poinso's solution $J_a a^2 = J_2 y^2 + J_3 z^2$, $J_a = J_2 \cos^2 \varphi + J_3 \sin^2 \varphi$, or a circle.

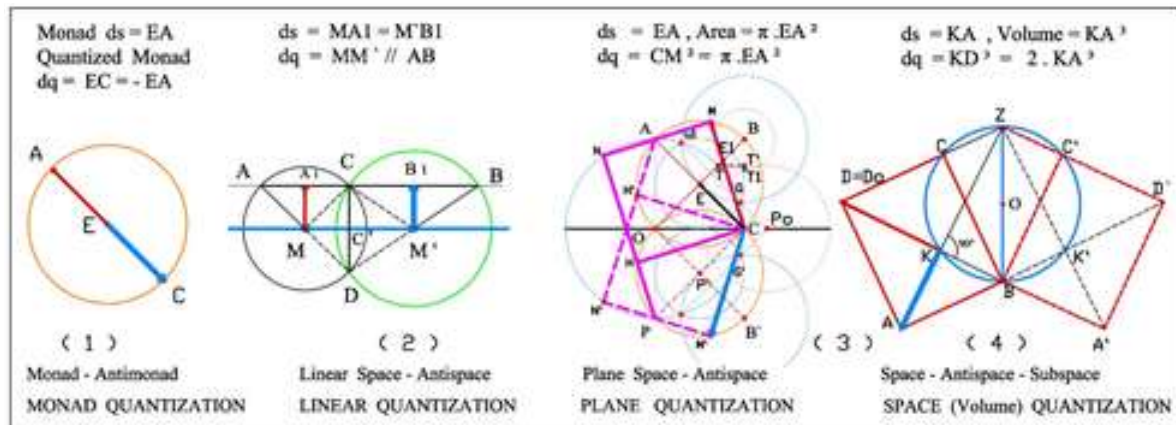


Figure –57. Quantization for Point E, for Linear $ds = MA_1$, for Plane π , Space (volume) $^{3/2}$. Moulds for E-geometry Quantization are, of monad EA to Anti-monad EC – of AB Line to Parallel line MM' – of AE Radius To the CM side of Square of KA Segment To KD Cube Segment.

The Numeric METERS of Quantization of Any material Monad $ds = AB$ are as $\rightarrow$
In any Point A, happens through Mould in itself (The material Point as a $\rightarrow \pm$ dipole) in [43]
In monad $ds = AC$, happens through Mould in itself for Two Points (The material Dipole in inner monad Structure as the Electromagnetic-Cyclodial field which equilibrium in Dipole by the Anti-Cyclodial field as in [43]). **For monad $ds = EA$ the Quantized and Anti-monad is $dq = EC = \pm EA$**

Remark 1: The Two Opposite signs of monads EA, EC represent the two Symmetrical equilibrium monads of Space-Antispace, the Geometrical dipole AC on Points A, C which consist Space AC as in F57-(1) **Linearly, happens through Mould of Parallel Theorem, where for any Point M**
Not on, $ds = \pm AB$, The Segment $MA_1 = \text{Segment } M'B_1 = \text{Constant}$. F57 - (1-2) MA_1

Remark 2: The Two Opposite signs of Monads represent the Two Symmetrical monads in the Geometrical machine of the equal and Parallel monads [$MM' \parallel AB$ where $MA_1 \perp AB$, $M'B_1 \perp AB$ and $MA_1 = M'B_1$] which are $\rightarrow$ The Monad MA_1 – Antimonad $M'B_1$, or $\rightarrow$ The Inner monad MA_1 Structure – The Inner Anti-monad structure $M'B_1 = -MA_1$ = The Idle, and { The Space = line AB, Anti-Space = The Parallel line MM' = constant }.
 The Parallel Axiom is no-more Axiom because This has been Proved as a Theorem [9-32-38-44].

Plainly, happens Through Mould of Squaring of the circle, where for Any monad $ds = CA = CP$, The Area of Square CMNH is equal to that of one of the five conjugate circles and Number $\pi = \text{constant}$, or $CM^2 = \pi \cdot CE^2$.

On monad $ds = EA = EC$, The Area = $\pi \cdot EC^2$, and the Quantized Anti-monad $dq = CM^2 = \pm \pi \cdot EC^2$ and this because are Perpendicular and Produce Zero Work. F57-(3)

Remark 3:

The Two Opposite Signs represent The Two Symmetrical Squares in Geometrical machine of the equal and Perpendicular monads as, [$CA \perp CP$, and $CA = CP$], which are $\rightarrow$ The Square CMNH – Antisquare $CM'N'H'$, or $\rightarrow$ The Space – The Idol = Anti-Space.

In Mechanics this Propety of monads is very useful in Work area, where The Two Perpendicular Vectors Produce Zero Work. {Space = Square CMNH, Anti-Space = Anti-Square $CM'N'H'$ }.

In Three Dimensional Space, happens Through Mould Doubling of the Cube, where for Any monad $ds = KA$, The Volume or, The cube of a Segment KD is the Double the Volume of KA cube, or Monad $KD^3 = 2 \cdot KA^3$. On Monad $ds = KA = Q_{AKA}$, The Volume = $KA^3 = \{CMNH \times PN\}$, And the quantized Anti-monad, $dq = KD^3 = \pm 2 \cdot KA^3$. F56-(4)

Remark 4 :

The Two Opposite Signs represent the Two Symmetrical Volumes in Geometrical machine of Triangles $[\Delta ADZ \perp \Delta ADB]$, which are $\rightarrow$ The cube of a Segment KD is the Double the Volume of KA cube The Anti-cube of a Segment $K'D'$ is the Double The Anti-volume of $K'A'$ cube, Monad $ds = KA$ The Volume $= KA^3$, and the Quantized Anti-monad $dq = KD^3 = \pm 2 \cdot KA^3$.
 {The Space = The Cube KA^3 , The Anti-Space = The Anti-Cube KD^3 }.

In Mechanics This Property of Material monads is very useful in the Interactions of the Electromagnetic Systems where Work of Two Perpendicular Vectors is Zero .{ Space = Volume of Anti Space $KA = \text{Anti-Volume of } KD$, and This is applied to Dark-matter , Dark - Energy in Physics } . [43]

Radiation of Energy is enclosed in a cavity of the tiny Energy volume λ , (which is the cycloidal wavelength of monad) with perfect and absolute reflecting boundaries where this cavity may become infinite in every direction and thus getting in maxima cases (The Edge limits) or the Properties of Radiation in free Space .

The Constructing relation between segments $K_o X$, $K_o A$ is $\rightarrow (K_o X)^2 = (K_o A)^2 \cdot (XX_1 / AD)$ Such that $XX_1 \parallel AD$, as in Fig.57-(4), F58-(3). All comments are left to the Readers , 30 / 8 / 2015.

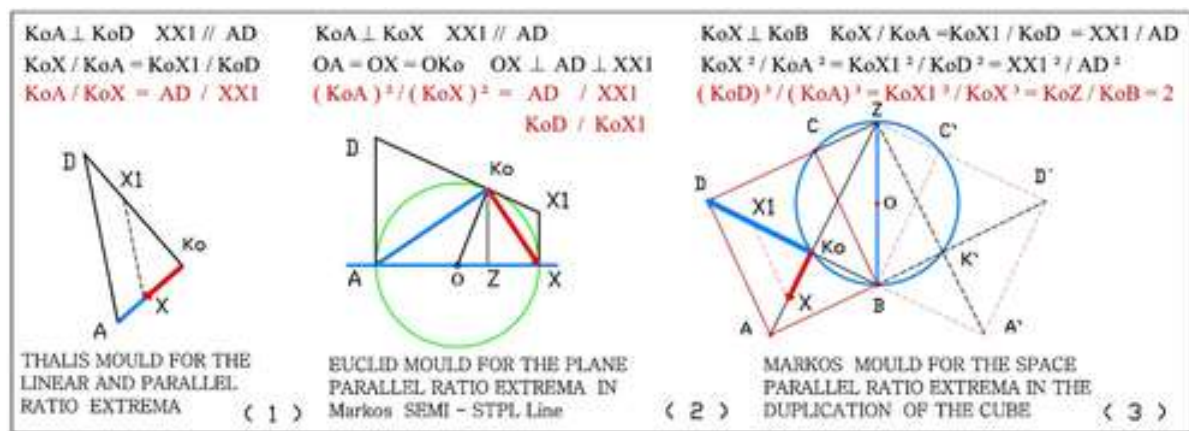


Figure –58. The Thales , Euclid , Markos Mould , for the **Linear – Plane - Space** , Extrema - Ratio – Meters .

The Electromagnetic Vibrations in this Volume is Analogous to Vibrations of an Elastic Body (Photo-Elastic Stresses in an Elastic material [18]) in this tiny volume , and thus Fringes are a superposition of these Standing (stationary) Vibrations .[41]

Above are Analytically shown , the Moulds (The Three basic Geometrical Machines) of Euclidean Geometry which create The METERS of monads i.e.
 Linearly is the Segment MA_1 , In Plane The Square $CMNH$, and in Space is Volume KD^3 in all Spaces , Anti-spaces and Sub-spaces .

This is the Euclidean Geometry Quantization in Points to its constituents , i.e. The

- 1.. **METER** of Point A is the Material Point A , the ,
- 2.. **METER** of line is the discrete Segment $ds = AB = \text{monad} = \text{Constant}$, The
- 3.. **METER** of Plane is that of the number π , on Segment = monad , which is The Square equal to the area of The
- 4.. **METER** of Volume is that of Cube $\sqrt[3]{2}$, of Any Segment = monad , which is The Double Cube of Segment and Thus is the measuring of the Spaces , Anti-spaces and Sub-spaces in this cosmos .
- 5.. In Physics , **METER** of Mass is the Reaction of Matter , Anything material , against Motion , The contrast Inertia of matter against Kinetic effects , and it is a number only without any other Physical meaning . [39-40]
 The meter of mass during a Parallel -Translation is a constant magnitude for every Body ,while for Moment of Inertia during a Rotational - motion is Not , except it is referred to the same axis of the Body. markos 11 / 9 / 2015 .

2.3 The Three Master - Meters in One , for E-geometry Quantization , F-58

Master - meter is the linear relation of the Ratio , (*continuous analogy*) of Geometrical magnitudes , of all Spaces and Anti-spaces in any monad .This is so because of the , Extrema - Ratio - Meters .

Saying **master-meters** , we mean That the Ratio of Two or Three Geometrical magnitudes , is such that they have a linear relation (*continuous analogy*) in all Spaces , *in One in Two in Three Dimensions*, as this happens to the Compatible Coordinate Systems as these are the Rectangular [x,y,z] , [i,j,k] , the Cylindrical and Spherical -Polar . The Position and the Distance of Points can be then calculated between The Points , and thus to **Perform independent Operations** (Divergence , Gradient , Curl , Laplacian) on Points Only .This Property issues on material Points and monads .

This is permitted because , Space is Quaternion and is composed of Stationary Quantities , The Position $\vec{r}(t)$ and The Kinematic Quantities , the Velocity $\rightarrow \vec{v} = d\vec{r}/dt$ and acceleration $\rightarrow \vec{a} = d\vec{v}/dt = d^2\vec{r}/dt^2$.

Kinematic Quantities are also The tiny Energy volume caves (*the cycloid length , λ ,*)The Space of velocity $\vec{v}$, and acceleration $\vec{a}$ consist in gravity's field **The infinite Energy Dipole Tanks** in where Energy $\equiv$ motion , is conserved) . In this way all operations on Edge Points are Possible and applicable .

Remarks :

In F58-(1) ,The Linear Ratio , *for Vectors* , begins from the same Common Point K_0 , of the Two concurring and Non- equal , Concentric and Co-Parallel Direction monads $K_0X - K_0A$ and becomes $K_0X_1 - K_0D$. In F58-(2) ,The Linear Ratio , *for Plane* , begins from the same Common Point K_0 , of the Two Non-equal , Concentric and Co-Perpendicular Direction monads.

Proof :

Segment $K_0A \perp K_0X$ because Triangle AK_0X is Rightangled Triangle and $K_0Z \perp AX$.

Radius $OK_0 = OA = OX$. Since DA , X_1X are also Perpendicular to AX , Therefore $K_0Z \parallel X_1X \parallel DA$. According to Thales Theorem-Ratio $(ZA/ZX) = (K_0D/K_0X_1)$ and since tangent $DA = DK_0$ and $X_1K_0 = X_1X$ Then issues $AZ / ZX = DA / XX_1$. From Pythagorean Theorem (Lemma 6) $\rightarrow K_0A^2 / K_0X^2 = (AZ / ZX) = (DA / XX_1) = (K_0D / K_0X_1)$ **i.e.**

The Ratio of the Two Squares K_0A^2 , K_0X^2 are Proportional to line Segments K_0D , K_0X_1 . (o.e.δ).

In F58-(3) ,The Linear Ratio ,*for Volume* , from the same Common Point K_0 , of The Two Non-equal , Concentric and Co-perpendicular Direction monads.

In (1) $\rightarrow$ Segment $K_0A \perp K_0D$, Ratio $K_0X / K_0A = K_0X_1 / K_0D$, and Linearly (*in one dimension*) the Ratio of $K_0A / K_0X = AD / XX_1$, i.e. in Thales linear mould [$XX_1 \parallel AD$] , **Linear Ratio of Segments XX_1 , AD is , Constant and Linear , and it is the Master key Analogy of the Two Segments , monads .**

In (2) $\rightarrow$ Segment $K_0A \perp K_0X$, $OK_0 = OA = OX$ and since OX_1 , OD are diameters of the Two circles Then $K_0D = AD$, $K_0X_1 = XX_1$, and Linearly (*in one dimension*) the Ratio of $K_0A / K_0X = AD / XX_1$, in Plane (*in two dimensions*) the Ratio $[K_0A]^2 / [K_0X]^2 = AD / XX_1$, i.e. in Euclid's Plane mould [$K_0A \perp K_0X$] ,

The Plane Ratio Square of Segments $-K_0A$, K_0X - is Constant and Linear , and for any Segment K_0X on circle $(O, O K_0)$ exists another one K_0A Such that ,
 $\rightarrow K_0A^2 / K_0X^2 = AD / XX_1 = K_0D / K_0X_1 \leftarrow$

i.e. The Square Analogy of the Sides in any Rectangle Triangle AK_0X is linear to Extrema Semi-segments AD , XX_1 or To K_0D , K_0X_1 monads , or The mapping of the continuous analog Segment K_0X to The discrete Segment K_0A .

In (3) $\rightarrow$ Segment $K_0B \perp K_0X$, $OK_0 = OB = OZ$ and since $XX_1 \parallel AD$, then $K_0A / K_0D = K_0X / K_0X_1 = AD / XX_1$, and Linearly (*in one dimension*) the Ratio of $K_0A / K_0X = AD / XX_1$ and in Space (*Volume*) (*in three dimensions*) the Ratio $[K_0A]^3 / [K_0D]^3 = [K_0X / K_0X_1]^3 = 1/2$. i.e. in Euclid's Plane mould [$K_0A \parallel K_0X$, $K_0D \parallel K_0X_1$] , **Volume Ratio of Volume Segments $-K_0A$, K_0D - , is Constant and Linear , and for any Segment K_0X exists another One K_0X_1 Such that $\rightarrow (K_0X_1)^3 / (K_0X)^3 = 2 \leftarrow$ i.e. the Duplication of The cube.**

In F-7 , The **Three** dimensional Space [$K_0 A \perp K_0 D \perp K_0 X \dots$] , where $XX_1 \parallel AD$, The **Two** Dimensional Space [$K_0 A \perp K_0 X$] , where $XX_1 \parallel AD$, The **one** Dimensional Space [$XX_1 \parallel AD$] , where $XX_1 \parallel AD$, is constant and Linearly Quantized in each dimension.

i.e. **All Dimensions of Monads coexist linearly in Segments – monads and Separately (They are the Units of the Three dimensional axis $x, y, z - i, j, k$ -) and consequently in All Volumes, Planes, Lines, Segments, and Points of Euclidean Geometry, which are all the one Point Only and which is Nothing.**

For more in [49-51] . 25 / 9 / 2015

At the beginning of the Article it was referred to Geometers scarcity from which instigated to Republish this article and to locate the weakness of Prooving these Axioms which created the Non - Euclid Geometries and which deviated General Relativity in Space-Time confinement . Now is more referred ,

a). There is Not any Paradoxes of The Infinite because is clearly defined what is a Point and what is a Segment.

b). **The Algebra of constructible numbers and number Fields is An , Absurd Theory** , based on groundless Axioms as the fields are , and with directed Non-Euclid Orientations which must be Properly Revised .

c). **The Algebra of Transcendental - Numbers has been devised To Postpone The Pure Geometrical thought** , which is the Base of all Sciences , by changing the Base - field of the Geometrical solutions to Algebra as Base which is Not . The Pythagorians discovered the existence of the incommensurable of the Diagonal of a Square in relation to its Side without giving up the Base of it , which is The Geometrical logic.

d). All Theories concerning **The Unsolvability of the Special Greek Problems are Based on Cantor's Shady-Proof** < That The Totality of All Algebraic numbers is denumerable > and Not edified on the Geometrical Basic logic which is the foundations of all Algebra .

The Problem of Doubling The cube F-54 , as that of the Trisection of any Angle , is a Kinematic Mechanical Problem with moveable Poles , and could not be seen differently , while Quadrature F-50 with constant Poles of Rotation and The Proposed Geometrical solutions are all clearly exposed to The critic of The Readers .

All Trials for Squaring The circle are shown in [44] and the set Questions will be answered on the Changeable-System of the Two Expanding Squares , Translation [T] and Rotation [R] . The solution of Squaring the circle using the Plane Procedure method or , The Three-Poles-Plane-Procedure method , is now Presented in F.1,2 , and consists an , Overthrow , to All existing Theories in Geometry , Physics and Philosophy .

e). Geometry is The Base of all sciences and it is The Reflective logic from the Objective Reality which is nature.

The Physical notion of Duplication of the Cube In The Primary -Energy - Genesis :

This Problem follows , The Three dimensional dialectic logic of Ancient Greek , Αναξίμανδρος , { « τό μή Ον , Ον γίγνεσθαι » The Non-Existent Exists when is Done , The Non - existent becomes and never is } , where **The Geometrical magnitudes** , have a linear relation (the continuous Analogy on Segments) in all Spaces as , in One in Two in Three dimensions , as this happens to the Compatible Coordinate Systems . The Structure of Euclidean Geometry is such [8] that it is a Compact Logic where , **Non - Existent** , -, is found everywhere , and **Existence** , + , The monads , is found and is done everywhere . In Euclidean Geometry , Points do not exist , but their Position and correlation is doing Geometry . The Universe cannot be created because is continuously becoming and Never Is [9]

According to Euclidean Geometry , and since The Position of Points (The Empty Space) creates The Geometry and Spaces , **Zenon - Paradox is The first concept of Geometry - Quantization** . [15].

In terms of Mechanics , Spaces-Mould happen through , Mould of Doubling The Cube , Where for Any Unit monad , $ds = |Q_{AKA}|$, **Exists The Energy-Analogous-Volume Energy- Square Prism**

$|Q_x \cdot Q_y| \cdot |AK_A| = E \equiv |k_x| \cdot |k_y| \cdot |x| \cdot |\lambda|$ and Is equal to The **Energy-Sphere Cone** $\equiv \mathbb{C} \cdot k \cdot \pi \cdot r^3 \equiv$ Energy

in a **Stationary Wave** . Motion of **EM-Wave** $= h f_L = h \frac{2n+1}{2} \left| \frac{c}{2\lambda} \right| = \frac{2n+1}{2} \left| \frac{hc}{\lambda = 2 \cdot r} \right| = (2n+1) \left| \frac{hc}{4 \cdot r} \right|$, i.e.

The Energy-Square-Prism $\equiv |Q_x| \cdot |Q_y| \cdot |AK_A| \equiv [EM]^3 \equiv |Q_{AKA}| \equiv Z_{AKA} \left| \frac{d}{r} \right| \equiv |\bar{e}| \cdot x \frac{3}{3} \equiv$

The Unit - Quantum of Energy .

It was Proofed that Energy of Electromagnetic-Waves is , Force x Displacement = Work $\equiv$ Energy $\equiv$

motion , therefore $k \lambda \equiv E \equiv \text{Constant} \equiv$ **The Energy - Quantum** , and Frequency $f = \frac{\sigma_1 \Phi}{2\pi r} = \frac{\sigma_1 \Phi}{\pi \lambda}$ is

$f_L = (n + \frac{1}{2}) \frac{v}{\lambda} \equiv \frac{0,5c}{\lambda}, \frac{1,5c}{\lambda}, \frac{2,5c}{\lambda}, \frac{3,5c}{\lambda}, \dots, \frac{(2n+1) \cdot c}{2 \lambda} = \frac{1}{2} \left[\frac{c}{\lambda} \right], \frac{3}{2} \left[\frac{c}{\lambda} \right], \frac{5}{2} \left[\frac{c}{\lambda} \right], \dots, \frac{2n+1}{2} \left[\frac{c}{\lambda} \right]$, Or

The cube of Energy-Segment $\{K_0 D \equiv ds = |Q_{AKA}|\}$, is **The Double , The Volume** of $K_0 A$ cube ,

And monad $K_0 D^3 = 2 \cdot K_0 A^3$, implies. **Increasing Twice The - Monad** $[EM]^3$,

This is one of the basic Geometrical Euclidean Geometry Moulds , which create The METERS of monads which $\rightarrow$ **Linear** is the Segment $ds = MA_1$, **Plane** is , π , the Square CMNH equal to the circle , and in **Space** is $^3\sqrt{2}$ volume K_0D^3 , in all Spaces , Anti-Spaces and Sub -Spaces of **monads** $\leftarrow$ i.e. The Expanding Square , $BA_0D_0C_0$, is Quantized to BADC Rectangle by Translation to Point Z , and by Rotation Through Point P , (the Pole of Rotation) . The Constructing relation between Any Segments K_0X , K_0A , is $(K_0X)^3 = (K_0A)^3 \cdot (X X_1 / AD)$ as in F-57 , where $|Q_{AKA}|$, or **Square Prism** $|Q_x \cdot Q_y| \cdot |AK_A| \equiv (K_0X)^3$ i.e.

1.. The Quantum-Power-Force $\rightarrow Q_{AKA} = |Z|_{AKA} \frac{d}{r} \equiv |\bar{e}| x \frac{3}{3} \leftarrow$, where $|\bar{e}|$ **Charge is the Unit-meter of Forces** .

2.. The Quantized-Charge-Forces $|Q_{AKA}| = \frac{\bar{x}}{H(w)} = [-i.2k\zeta] \equiv \pm \left| \frac{c\bar{s}}{r^2} \right| \cdot \left| \frac{3}{3} [\overrightarrow{AK_A}] \right| , \frac{2}{3} [\overrightarrow{AK_A}] , \frac{1}{3} [\overrightarrow{AK_A}]$

3.. The Coulomb-Force is $\rightarrow F_{Coulomb} = k_c \frac{Q_1 Q_2}{d^2} = \frac{[\oplus \rightarrow \rightarrow \ominus]}{d^2} = k_c \frac{2\sigma}{|e|^2} = k_c \left[\frac{4\pi f_1}{r\Phi} \right] = k_c \frac{\sigma}{2r^2} = k_c \frac{2\bar{c}}{r^2\Phi}$, and is **Dependent** on light-velocity and cave's inverse squared , And **Independently of Charges** .

4.. The Physical Energy-Vectors-Square-Prisms $\{CBAO \times PA\} \equiv |Q_x \rightarrow| \cdot |Q_y \uparrow| \cdot |\overrightarrow{q} \rightarrow_{P \rightarrow OA}|$, by Rotation - $\mathcal{U}$ - And this because of **Spin** $\equiv S$ creation { it is from the Cebas Rotational-equilibrium of the Outer Forces in STPL Capacitor as in Fig-30 } , and continually keeping , **The Pivot - Axis** , Perpendicular to the circle $\pi \cdot \left[\frac{CA}{\sqrt{2}} \right]^2$ as Total Work following Spin relation $\bar{B}_w = Jw^2 (= 2L)$.

5.. The Initial Energy-Prism $[CO \times CB \equiv CBAO] \times [\overrightarrow{q} \rightarrow_{P \rightarrow OA}]$, and because of minimum Stress - Friction $\equiv$ Stress , it Is **Transformed To** $\rightarrow$ **An Energy Truncate-Cone** $[CH \times CM \equiv |\pi \cdot CO^2/2|] \times [\overrightarrow{q} \rightarrow_{P \rightarrow HN}]$, of Energy Volume $\equiv |Q_x \rightarrow| \cdot |Q_y \uparrow| \cdot |\overrightarrow{q} \rightarrow_{P \rightarrow HN}| \leftarrow$ Is **Transformed To** $\rightarrow$ **An Energy Circular-Cone** $[CP \times CA \equiv CAK_A P \equiv 2CO^2] \times [\overrightarrow{q} \rightarrow_{P \rightarrow PK_A}] \leftarrow$ Is **Transformed To** $\rightarrow$ **An Energy ANTI-Circular-Cone** , because of **Obstacle** , $[\overrightarrow{q} \uparrow_{P \rightarrow PK_A}]$ which is The **Geometrical Duplication of Initial - Cube** CO^3 , **And Perpendicular to motions** $[\rightarrow \uparrow] \equiv \rightleftharpoons \downarrow$. The **Energy - Unit- Vectors - Square - Prisms** $\equiv |\oplus \rightleftharpoons \ominus| \pi \cdot r^2 \equiv \pi \cdot \bar{q}_o \cdot r^2 \equiv CM^2 [\rightarrow \uparrow]$ where in Wavelength $\lambda = 2r$, $|\overrightarrow{q} \rightarrow_{P \rightarrow A}| \equiv$ The Quanta of motion , $|\bar{q}_A|$, $|\bar{q}_N|$, $|\bar{q}_{K_A}|$, at Points , A , N , K_A , and for Photon $\bar{q}_{Photon} = \frac{G}{\sqrt{2} \cdot f} = \frac{G \cdot h}{\sqrt{2} \cdot E} \equiv |\overrightarrow{q} \rightarrow_{P \rightarrow A}|$, where Unit-Energy monad is $Q_y = Q \uparrow_{AKA} = |\downarrow| \equiv$ **The Quantum in y** , and $Q_x = Q \rightarrow_{AKA} = |\leftarrow| \equiv$ **The Quantum in x direction** .

For Energy-Vectors at Point C issues , $\overrightarrow{CB} = \overrightarrow{CO}$ and $\overrightarrow{CB} \perp \overrightarrow{CO}$ and form the **Resultant-Vector** $\overrightarrow{CA}$. As in Electricity , where The **Magnetic field created by the flow of current in a Conductor** , represents The Perpendicular-Lines of Forces , **Similarly** Material-Vector $\overrightarrow{CA}$ carries the **Conjugate-Force** $\overrightarrow{OB}$ from **Screwdriver** Inscribed to , $\overrightarrow{CB}$, $\overrightarrow{CO}$ Circle $\equiv \pi \left[\frac{CO}{2} \right]^2 \equiv \pi \frac{CO^2}{4}$, To the Circumscribed-circle $\pi \left[\frac{CO\sqrt{2}}{2} \right]^2 = \pi \frac{CO^2}{2}$, equal to **CMNH Square** , and To the Double-Area circle , $\pi \cdot [CO]^2 = 2 \cdot \left[\pi \frac{CO^2}{2} \right]$. This Property of **Vectors at Point C** issues for any Point **P** , which can have a **Screwdriver - Material-vector- PO** .

Application in Physics :

The Electromagnetic Waves are able to Transmit Energy through a Vacuum (Empty Space) by storing their Energy Vector in an Standing Transverse Electromagnetic Dipole wave , and so considered completely Particle like , and in the Transverse interference Pattern to be considered as completely Wave , so the Same Quantity of Energy is , **Energy** $I_d = \frac{\rho \pi^2 c^3}{2\lambda^2} [eE^2 + \mu H^2] \pi \equiv \bar{q}_o \cdot r^2$, in volume $V = \left[\frac{4\pi \cdot (w^2 r^2)^3}{3} \right]$ having mass $\rightarrow$ and It is **Particle Energy** $I_d = \left(\frac{\rho \cdot c}{2} \right) \cdot (wA_0)^2$ and in Interference Pattern $\rightarrow$ where It is The **Wave Energy** . This is the Wave-Particle Duality unifying the classical Electromagnetic field and The Quantum-Particle of light , and the Angular Momentum of Particles is Their-Spin as ,

$\bar{B} = \frac{2L}{w} = \frac{2L}{2\pi f} = \left[\frac{2L}{2\pi} \right] \cdot \left[\frac{1}{f} \right] = \frac{4\pi \cdot (hf)}{(1 + \sqrt{5}) \cdot \sigma} = \left[\frac{h}{2\pi} \right] = \frac{\text{Constant}}{2\pi} \left[\frac{1}{f_m} \right] = \frac{c^4}{2\pi} \left(\frac{2\pi \cdot r}{\sigma \cdot \Phi} \right) = \left(c^4 \frac{2\pi \cdot r}{2\pi \cdot r \cdot C} \right) = c^3 = [w \cdot r]^3 = \text{SPIN} , \text{ or Spin} = \frac{h}{2\pi} = 2 \cdot [wr]^3$, or **Energy Space Quantity** , wr , is Doubled and becomes the Space Quantity $\frac{h}{\pi}$. The above relation of Spin shows the deep relation between **Mechanics and E-geometry** , where in the tiny **Gravity-cave** of $r = 10^{-62}$ m , the Energy -Volume - Quantity $[wr]$ in cave , is Doubled and is Quantized in Planck's - cave Space Quantity as , $\left(\frac{h}{\pi} \right) = \text{Spin} = 2 \cdot [wr]^3 = \frac{2L}{2\pi f}$ in $r = 10^{-35}$ m i.e. Energy Space Quantity , wr , is Quantized , and becomes The New Space-Quantity , $h/\pi = 2 \cdot [wr]^3$, Doubled , following the Euclidean Space-mould of Duplication of the cube by changing frequency , in tiny Sphere Volume $V = (4\pi/3) \cdot [wr/2]^3$. Since also , $w = E / [h/2\pi] = m \cdot c^2 / [h/2\pi] = 2\pi \cdot m \cdot c^2 / h$, and becomes $wh = 2\pi \cdot m \cdot c^2$, where mass $m = \frac{wh}{2\pi \cdot c^2} = \frac{w \bar{B}}{2\pi \cdot c^2} = \frac{2L}{2\pi \cdot c^2} = \frac{L}{\pi \cdot c^2} = \frac{\pi^2 r^4 \cdot f}{\pi \cdot c^2} = \frac{\pi \cdot r^4 \cdot f}{c^2} = \frac{[\pi r]^2 \cdot f}{w^2}$, and is what is called the conversion factor mass m , and it is an Index of the Energy changes . The Energy magnitudes from $0 \rightarrow \infty$ by changing their frequency deposit in the same Space , and this

happens *when These are in Resonance* .

GRAVITATION, DUALITY PHOTON ,AND ELEMENTARY-PARTICLES IN COSMOLOGY

In Fig-60 , is Unveiled and Presented , The Geometry-Vectors $CA \perp CP$, following their rules and

- Material** –Geometry -Vectors $\overrightarrow{CA} \perp \overrightarrow{CP}$, following their Quaternion – rules . as in
- 1,1A). **The Space , Anti-Space Geometry-Vectors** , On Rotating and Expanding - Squares Mechanism .
 - 2-4). **The Natural 3-Phase STPL - Circuit** , of **Primary- Particles -Generator** and 3-D Equilibrium.
 - 3-5). **The 3-D Equilibrium of Spaces , Anti-Spaces-Vectors , In Material-Cosmology-Equilibrium .**
 - 6-9). **The Electromotive-Forces** , in Wavelength , λ , of **Duality - Photon** and their **3-D Equilibrium**
 - 7-9). **The Particles Antiparticles Genesis** in STPL- Circuit , Their Propagation and **3-D Equilibrium .**
 - 10-). **The ANTI - Electromotive-Forces ,of Particles ANTI - Particles and Cosmology-Equilibrium.**

In (1-1A) is shown ,{**The Geometry $\equiv$ The SPACE**} , *The Plane Procedure method* ,which is

consisted of **Two Equal and Perpendicular Geometry -Vectors** , CA , CP , *The Mechanism* , where issues $CA = CP$ and $CA \perp CP$ such , That The **Area** Produced to be **Constant** and this because each Area is Constant , with The Three conjugate Poles , A , C , P related to Central Point O , with The Three **Pole-lines** , PA , PN , PK_A and The Three Perpendicular **Anti-Pole-lines** , CO , CH , CP , and is thus Converting The Three-Rectilinear Resultant - Vectors , CA , CN , CK_A of this Mechanism , To The Four - Polar Expanding and Rotational – Diagonals of Squares $CBAO$, $CMNH$, CAK_AP , on the Two circles of diameters CA , CK_A , as issues in **Markos - Theorem** , where their Circumscribed - circles , their circles and their Inscribed-circles meet on an Common-Point such that Squares the circle . The circumscribed circle on Them define **A System of Infinite Changable - Squares from** The Inscribed $CBAO$ To $\rightarrow CMNH$ which is equal to The circle and To $\rightarrow$ The Circumscribed $CAK_AP = 2$ [The Inscribed $CBAO$] , where Their Cubes are Doubled , and All change **Through These Four-Poles of Rotation** .

In (2-4-6) is shown **The Material Vectors $\equiv$ The ENERGY $\equiv$ The motion** which is **Placed ON Prior -SPACE** which is consisted of **Two Equal and Perpendicular QUATERNION** , $\overrightarrow{CA}$, $\overrightarrow{CP}$, *TheMaterial -Mechanism* and are $\overrightarrow{CA} = \overrightarrow{CP}$ and $\overrightarrow{CA} \perp \overrightarrow{CP}$, such that The **WORK** Produced to be Constant , and this because of The **constant Quantum** of motion , and The Three conjugate Space-Poles [A , P , C] related to center Point O ,with Three **Pole-lines** ,The Vectors K_AK_B , K_AK_C , K_BK_C , Their Perpendicular **Anti-Pole-lines** $\overrightarrow{AK_A}$, $\overrightarrow{BK_B}$, $\overrightarrow{CK_C}$,and **CONVERTING THE - NINE-VECTORS** $\overrightarrow{AK_A}$, $\overrightarrow{AK_B}$, $\overrightarrow{AK_C}$, $\overrightarrow{BK_A}$, $\overrightarrow{BK_B}$, $\overrightarrow{BK_C}$, $\overrightarrow{CK_A}$, $\overrightarrow{CK_B}$, $\overrightarrow{CK_C}$, of **THIS MOVABLE Mechanism Embodied with Prior-Stationary - SPACE** , To $\rightarrow$ **PRIMARY- Forces and Particles Constituents** $\leftarrow$ On The Nine above Vectors $\equiv$ Conductors which are Quaternion and Anti - Quaternion .

This Quaternion and Anti-Quaternion , **Forces - System , Equilibrium Axially** , Through *The Ptolemy's – Inner-Connectors-Products* of the Forces - Squares – Diagonals , And **Rotationally** Through *The Ceba's – Outer-Cyclic-Connectors-Ratio* , $[AK_C].[BK_A].[CK_B]=[AK_B].[CK_A].[BK_C]$ of **Forces-Squares-Conductors** . For the **Total-Rotational-Equilibrium Of Space , Anti-Space as Antiparticles** in (2-10 Fig.60) , and in (I -Fig.30) . Forces in Conductors and Magnetic – fields follow Fig-59.

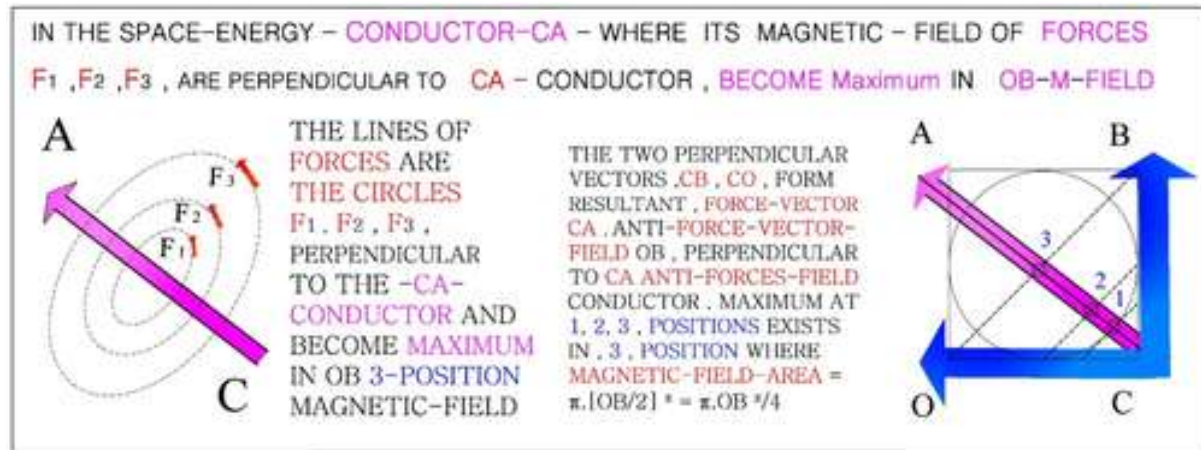


Figure – 59 . The Space-Energy - Conductor CA , forms the Perpendicular-Circles , F_1, F_2, F_3 , as Lines -Forces Into the Magnetic-Field $M_{CA-1,2,3}$, which is Perpendicular to CA Conductor and which becomes maximum at OB Magnetic-Field-Position , MF_{3-max} , in STPL-Circuit Mechanism , and where Energy is Doubled at the End – Conductors - Point A .

At Point C , and On the Two Perpendicular Vectors , $\vec{CO}$, $\vec{CB}$, the Forces exist into their two Perpendicular Magnetic-fields which Resultance CA transfers Magnetic-fields on CA , 1 , 2 , 3 ,Positions . From Fig-59 is seen that Position with maximum Energy = max. Magnetic-field = **max. motion** happens on OB diameter of the Circumscribed-circle $\pi \cdot [\frac{CO\sqrt{2}}{2}]^2 = \pi \cdot \frac{CO^2}{2}$, and equal to CMNH Square , of Fig-[60-1] .

For Energy-Vectors at Point C issues , $\vec{CB} = \vec{CO}$ and $\vec{CB} \perp \vec{CO}$ and form the Resultant-Vector $\vec{CA}$. As in Electricity ,where The Magnetic field created by the flow of current in a Conductor, represents The Perpendicular-Lines of Forces , Similarly Material-Vector $\vec{CA}$ carries the Maximum Conjugate-Force $\vec{OB}$, from Screwdriver Inscribed to , $\vec{CB}, \vec{CO}$ Circle $\equiv \pi [\frac{CO}{2}]^2 \equiv \pi \frac{CO^2}{4}$, to the Circumscribed-circle $\pi [\frac{CO\sqrt{2}}{2}]^2 = \pi \frac{CO^2}{2}$, which is equal to CMNH Square , The Anti-Quadrature , and To the Double-Area circle , $\pi [CO]^2 = 2 \cdot [\pi \frac{CO^2}{2}]$ st Point A . This Property of Vectors at Point C issues for any Point , P , which can have a Screwdriver – Material - Vector- PA .

As in Electricity , The flow of current in a Conductor creates a Magnetic-field Perpendicular to the Conductor , Similarly Attack of $\oplus$ to $\ominus$ creates all above in $[\oplus \rightarrow PA \leftarrow \ominus]$ Conductor .

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Geometry Space and Anti-Space Exist as Points Placed on an Circle which is The - Neutral - Space [59-60] .**Energy** $\equiv$ **motion** ,and Exist as **Attack or Repel** between the-Two Charges , $[\oplus \text{ charge} = +]$ $[\ominus \text{ charge} = -]$, Placed on a **Space AB = Displacement AB = The Conductor AB** with **Force-Charge** as $\overrightarrow{AB}$, carrying charge = motion from A to B Position.in an Magnetic- Field Perpendicular to AB , and for the **Opposite-motion** , is **The-Anti-Force-Charge** as $\overrightarrow{BA}$, carrying charge from B to A Point , in the Opposite Magnetic-field which is the Space Position .

$\overrightarrow{AB}$ Vector or , $|Q_{X=AB} \Rightarrow|$, applied on AB Conductor , when meet an Obstacle which is the Opposite Charge **Then** the Only Possible-motion is **The Transverse-motion** , as $|Q_{Y \perp AB} \uparrow \uparrow| \equiv |Q_{X=AB} \Rightarrow|$, i.e. The **Force-Charge** $\overrightarrow{AB}$ in Conductor AB becomes an **Plane-Squares-Vector** $|Q_{AB} \Rightarrow|, |Q_{AB} \uparrow \uparrow| \equiv |\vec{Q} \uparrow \uparrow_{\overrightarrow{AB}}|^2$ in the form of a Vector-Product , where **Plane of Vectors** Fits-To **Geometry - Vectors** , CO , CB , in **The Mechanism** , of **Plane Procedure Method** , and Action $\rightarrow \vec{Q} \Rightarrow_{\overrightarrow{AB}} = [\oplus - [d = AB] - \ominus] = \overrightarrow{AB}_X \leftarrow$ This Action exists in Electricity , where Total-Charge $Q_N = i = \frac{\text{Charge}}{\text{Time}} = \frac{q}{T=1} \equiv 1,6022 \cdot 10^{-19}$ Coulomb . The Reaction to this motion **At Point-B** of Conductor AB is, $I_{AB/B} = 1/3 \cdot [m_{AB}] \cdot (AB)^2 = 1/3 \cdot [|\vec{Q}_{\overrightarrow{AB}}|^2] \cdot (AB) \equiv \frac{1}{3} [\text{Area of Base}] \cdot \text{Height}$, and which is **On Mechanism** , **The Square-Cone** $\frac{1}{3} [\overrightarrow{CO} \times \overrightarrow{CB}] \times \overrightarrow{OA}$, and for **The Energy Cone** as $CB = CO = OK_A$ is $\rightarrow V_{\text{Prism}} \equiv |\overrightarrow{Q} \times \vec{Q}| \equiv \vec{q} \times |\overrightarrow{OK_A}| \equiv |\vec{Q}_{\overrightarrow{AB}}| \cdot |\vec{Q}| \equiv \frac{c\vec{S}}{r^2} \cdot |\vec{Q}| \leftarrow$ Or **Energy-Cone-Force** $\vec{F} = \vec{q} \times [\vec{c}] \times \{ \frac{\vec{S}}{r^2} \} \cdot |\vec{Q}| = \frac{mvr = m \cdot 2\pi f \cdot r}{r^2} |\vec{Q}| = (\frac{\sigma \Phi}{r^2}) \cdot |\vec{Q}| = \overrightarrow{B}_{\text{Field}} \} = \vec{q} \times \vec{c} \times \overrightarrow{B}_F$, which agree with **Lorentz - Force** , Electromotive-Forces $F = \vec{q} \vec{v} \times \overrightarrow{B}_F \equiv Q_{\pm} = \frac{v \cdot \vec{S}}{r^2} \equiv |\frac{c \cdot \vec{S}}{r^2}|$, where from **Quantized-Charge-Forces** $|Q_{\overrightarrow{AK_A}}| = \frac{\vec{X}}{H(w)} = [-i \cdot 2k\zeta] \equiv \pm |\frac{c \cdot \vec{S}}{r^2}| \cdot \frac{1}{3} [\overrightarrow{AK_A}]$ where then issues ,

- 1...Charge $\vec{q} \equiv$ **The Inertia** of $|AB|$ Conductor at Point B, $I_{AB/B} = \frac{1}{3} [m_{AB}] \cdot (AB)^2 = 1/3 \cdot [|\vec{Q}_{\overrightarrow{AB}}|^2] \cdot (AB)$
- 2...Velocity $\vec{v} = \vec{c} = 2\pi f \cdot r = \sigma \Phi \equiv$ **The Stress-Executed On Unit-Surface** Φ from Plane-Squares $|\vec{Q}_{\overrightarrow{AB}}|^2$
- 3... Magnetic-Field $\overrightarrow{B}_F$ is **The Sweeping** of **The-Plane-Squares-Vectors-Area** r^2 , from the Velocity-Vector $\vec{c}$,as relation $(\frac{\sigma \Phi}{r^2}) \cdot |\vec{Q}| = (\frac{2\pi r \cdot f}{r^2}) \cdot |\vec{Q}| = \frac{w}{r} = \frac{v}{r^2} = \frac{\vec{c}}{r^2}$. and the Process of **actions for Particles** follows,
 - a...The **Position** of $\oplus$ -Space $\equiv A, B, C$, $\ominus$ -Anti-Space $\equiv K_A, K_B, K_C$, $\emptyset$ -Sub-Space $\equiv A_E, B_E, C_E$ or Neutral-Space At their Positions on Common-circle , creates **The-Nine-Vectors** $\equiv$ **The-Force-Stresses** $\overrightarrow{AK_A}, \overrightarrow{AK_B}, \overrightarrow{AK_C}, \overrightarrow{BK_A}, \overrightarrow{BK_B}, \overrightarrow{BK_C}, \overrightarrow{CK_A}, \overrightarrow{CK_B}, \overrightarrow{CK_C}$ which are The-Elementary-Particles (Fig-26-29) .
 - b...The **Position** of $\oplus$ -Space $\equiv K_A, K_B, K_C$, $\ominus$ -Anti-Space $\equiv A, B, C$, $\emptyset$ -Sub-Space $\equiv A_E, B_E, C_E$ At their New - Positions on Common-Circle, creates **The-Nine-Anti-Vectors** $\equiv$ **The-Anti-Force-Stresses** $\overrightarrow{K_A A}, \overrightarrow{K_A B}, \overrightarrow{K_A C}, \overrightarrow{K_B B}, \overrightarrow{K_B C}, \overrightarrow{K_B A}, \overrightarrow{K_C C}, \overrightarrow{K_C A}, \overrightarrow{K_C B}$,which are Anti-Elementary-Particles .
 - c...The **Position** of $\oplus$ -Space $\equiv A, B, C$, $\ominus$ -Anti-Space $\equiv A_E, B_E, C_E$, $\emptyset$ -Sub-Space $\equiv K_A, K_B, K_C$ At their Positions on Common-circle ,creates **The-Nine-Vectors and Anti** $\equiv$ **The-Force and Anti-Stresse** $\overrightarrow{AA_E}, \overrightarrow{AB_E}, \overrightarrow{AC_E}, \overrightarrow{BB_E}, \overrightarrow{BC_E}, \overrightarrow{BA_E}, \overrightarrow{CC_E}, \overrightarrow{CA_E}, \overrightarrow{CB_E}$ which are Elementary-Particles,Anti-Particles.
 - d...The **Position** of $\oplus$ -Space $\equiv A_E, B_E, C_E$, $\ominus$ -Anti-Space $\equiv A, B, C$, $\emptyset$ -Sub-Space $\equiv K_A, K_B, K_C$ At their Positions on Common-circle , creates **The-Nine-Anti-Vectors** $\equiv$ **The-Anti-Force , Anti-Stresses** $\overrightarrow{A_E A}, \overrightarrow{A_E B}, \overrightarrow{A_E C}, \overrightarrow{B_E B}, \overrightarrow{B_E C}, \overrightarrow{B_E A}, \overrightarrow{C_E C}, \overrightarrow{C_E A}, \overrightarrow{C_E B}$,and are Cosmic-Particles ,Anti-Particles.

In (1) $\rightarrow$ {**The Geometry** $\equiv$ **THE SPACE**} , **The Plane Procedure method** , is consisted of The **Two Equal and Perpendicular GEOMETRY- Vectors** , CA, CP , and ,

In (4) $\rightarrow$ {**The MATERIAL Vectors** $\equiv$ **The ENERGY** $\equiv$ **The motion** , Is Placed ON Prior - SPACE consisted of **Two Equal and Perpendicular Quaternion** $\overrightarrow{CA}, \overrightarrow{CP}$, as **Markos - Material Mechanism** which are , $\overrightarrow{CA} = \overrightarrow{CP}$ and $\overrightarrow{CA} \perp \overrightarrow{CP}$, and **The Two Types of Vectors**

Consist The Natural-Mechanism on which **Forces-System** , **Equilibrium Axially** , Through **The Ptolemy's - Inner - Connectors - Products** of the Forces-Squares- Diagonals , And **Rotationally** Through **The Ceba's - Outer-Cyclic-Connectors-Ratio** issuing for all Cosmology Stability as in [G . Fig-17] . It was shown in [82 - 86] , that The SPACE is a **Huge - Electrostatic-Magnet** becoming from the **Infinite Dipole-Opposite and Primary-Charges** which is **THE-ENERGY-PART** ,of the Two-Primary-Points $\overrightarrow{\oplus}$ to $\overrightarrow{\ominus}$. **There is Not Vacuum** , instead exist the **Infinite - Material-Points** created from the Periodic excitation and which are **Spinning in Opposite-Pairs for Stability** (Fig-59, 3). The Un bonded-Force **G** , or **Gravitational constant** , **G** , was shown to be the **Electric - Field-lines** , i.e.

The SPACE is a **Huge-Electrostatic-Magnet** becoming from the **Infinite - Dipole - Opposite - Primary-Charges** which is **THE-ENERGY- PART** ,of The only Two-Primary- Points $\overrightarrow{\oplus}$ to $\overrightarrow{\ominus}$, and The Opposite $\pm$ Spin equilibrium in Space Part [Fig-17] .

Energy $\equiv$ **motion** , Exist in Conductor CO as Square $\equiv |\vec{Q} \uparrow_{\overline{CO}}|^2$ and Charge $\vec{q} \equiv$ **The Inertia** $\equiv$ **mass** of $|\overline{CO}|$ At Point O as , $I_{CO/O} = 1/3.[m_{CO}].(CO)^2 = 1/3.[|\vec{Q} \uparrow_{\overline{CO}}|^2].(CO) \equiv$ **An Energy- Square-Cone which Vectors** , $|\vec{Q} \uparrow_{\overline{CO}}| \equiv CO$, and $|\vec{Q} \uparrow_{\overline{AB}}| \equiv OB$, **FIT as The-Resultant of Vectors** , CO , CB . In (1) , The **Geometry - Vectors** , PA , PN , PK_A , **Sweep The Nibs** , A , N , K_A , of the Diagonals CA , CN , CK_A , of the Three Squares , CBAO , CMNH , CAK_AP , **And Changes** ,

- 1).. Square CBAO with its Circumscribed circle [E , EA] , **To Square** CMNH , Equal to this circle ,
- 2).. Square CMNH which is Equal to the circle , πEO^2 , **To The Double Area** Square CAK_AP .

In (2) , The **Energy - Vectors** , $\vec{CA}$, $\vec{CN}_M$, $\vec{CK}_A$, **Sweep The Nibs** , A , N , K_A , of this Resultant-Vector , CA , CN , CK_A , of the **Three Energy-Volume-Vectors** $[\vec{CO} \times \vec{CB}] \pm [\vec{CK}_A \perp]$ $\equiv [\pm \vec{CA} = \pm |\vec{CO} \times \vec{CB}|] \times [\vec{CK}_A \perp] \equiv$ **The Energy - Tetrahedron** $\equiv$ **Orthogonal-Triangle - Cone** $\vec{V}_T = \{ \pm |\vec{CO} \times \vec{CB}| = \pm [\frac{CO.CB}{2}] . [\perp \vec{Q} \uparrow_{\overline{CK}_A}] \}$, and which **Energy - Tetrahedron Equally- Changes To** ,

- 1).. The Circumscribed Circle-Cone , $[\frac{\pi.OB^2}{4} \times \vec{CK}_A \perp \frac{3}{3}]$ of Volume , $[\frac{\pi.OB^2}{4} \times \vec{CK}_A \frac{3}{3}]$, **To Sphere** $\frac{4\pi}{3} r^3$
- 2).. The Circular-Cone $[\frac{\pi.NC^2}{4} \times \vec{CK}_A \frac{3}{3}] \equiv \sqrt{\pi} . \text{Sphere} \frac{4\pi}{3} r^3$, **To Double Volume-Sphere** $2 . \{ \frac{4\pi}{3} r^3 \}$
- 3).. The Double Volume $2 . \{ \frac{4\pi}{3} r^3 \}$, To An **Equivalent and Energy-Sphere - Cone** , $\mathbb{C} = k \pi r^3$

Proof :

The **Plane-Space** $CO \times CB = CO^2$ becomes **Volume-Space** by multiplication of Unit-Area x Unit-Length , CO^2 . $CO = CO^3$, and In **Vectors Type** $\Rightarrow \{ \text{Unit-Area} = [\vec{CO} \times \vec{CB}] \equiv \vec{CO} \times \vec{CB} \uparrow \} \times \{ \text{Unit-Length} \equiv \vec{CO} \uparrow \}$ or **Unit -Volume** $[\vec{CO} \times \vec{CB} \uparrow] \times \vec{CO} \uparrow \equiv | \vec{L} \rightarrow | \equiv | : : \rightarrow \gg |$. (1E) which is **The-Geometry-Square-Cone** Above Volume becomes **Energy-Volume** as $[\vec{CO} \times \vec{CB} \uparrow] \times \vec{OB} \uparrow \equiv |\vec{Q}_X \cdot \vec{Q}_Y| |\vec{OB} \uparrow| \equiv \pm [\frac{CO.CB}{2}] . |\vec{Q} \uparrow_{\overline{CK}_A}|$ and Is The **Energy-Volume** $\vec{V}_A \equiv \pm [\frac{CO.CB}{2}] . |\vec{Q} \uparrow_{\overline{CK}_A}| =$ **Orthogonal-Triangle-Cone** $\vec{V}_T$ at Point A . At Quadrature-Point N ,The **Orthogonal-Triangle** COB on Diameter OB becomes the **Circumscribed-Circle** $\pi [\frac{CO}{\sqrt{2}}]^2 . |\vec{Q} \uparrow_{\overline{CK}_A}| =$ **Circular-Cone** $\vec{V}_N$ at Point N of **Energy-Volume** $\vec{V}_N \equiv \pm \frac{1}{3} [\pi . \frac{CO^2}{2}] . |\vec{Q} \uparrow_{\overline{CK}_A}| = \frac{\pi.CO^2}{6} |\vec{Q} \uparrow_{\overline{CK}_A}| \equiv \sqrt{\pi} . \text{Sphere} \frac{4\pi}{3} r^3$. At Conductor- End Point K_A , The Prior **Circular-Cone** $\vec{V}_N$ and Sphere , becomes The $\pm \frac{1}{3} [\pi . (\frac{CA}{2})^2] . |\vec{Q} \uparrow_{\overline{CK}_A}| = \pm \pi \frac{(CO)^2}{3} . |\vec{Q} \uparrow_{\overline{CK}_A}|$, which is **The - Double Volume-Sphere** $2 . \{ \frac{4\pi}{3} r^3 \}$.

From Prior $|\vec{Q}_X = \vec{AA}_E| \Rightarrow |\vec{Q}_X|$, and $|\vec{Q}_Y = \vec{LA}_E| \Rightarrow |\vec{Q}_Y|$, Therefore $|\vec{Q}_X \cdot \vec{Q}_Y| \equiv \pm [\frac{CO.CB}{2}] \equiv \pm [\frac{CB^2}{2}] \equiv \pm \pi . [\frac{|\vec{Q}_X|^2}{2}] \equiv \pi . [\frac{|\vec{Q}_X|^2}{\sqrt{2}}]^2$ and The **Unit-Energy-Volume** $\vec{V}_A \equiv \pi . [\frac{|\vec{Q}_X|^2}{\sqrt{2}}]^2 . \vec{AK}_A \uparrow \equiv \pi . [\frac{|\vec{Q}_X|^2}{2}] . |\vec{AK}_A| \equiv \vec{q} \equiv \text{Circular-Cone} \equiv \vec{q} \equiv \vec{Q}_{AK_A} = |Z|_{AK_A} \frac{d}{r} \equiv |\vec{e}| \times \frac{3}{3}$, which is the Quanta of Charge in electron Particle .

It was shown in Figure -33– that The **Physical-Force-Polygon-Charges** , $[-1/3 , +2/3]$, as an 3-Phase - RLC - Circuit , on the , **STPL – Circuit - Mechanism** , is the same as the **Stability of The moving-System** when **The-Positive - Charge** $\oplus$ **Attacks** $\Rightarrow \gg$ **The-Negative - Charge** $\ominus$, and from Coulomb Force is created between them and on their different lengths $\equiv$ **Capacitor** , d , the direction of , $\vec{AK}_A = \vec{r}$ displacement is as $\oplus - d - \ominus \Rightarrow \vec{AK}_A = + \downarrow \frac{3r}{3}$, $\vec{KA}_A = - \uparrow \frac{3r}{3}$, $\vec{AE}_A = + \downarrow \frac{1r}{3}$, $\vec{EA}_A = - \uparrow \frac{2r}{3}$, This Newton-Coulomb-Force $\vec{F}_C = \vec{Q}_{AK_A}$ is compelled to **change -Velocity** from , $v_A = 0$, $v_d = \vec{c}$, $v_{K_A} = 0$, at Edge-Points A , K_A , therefore is an **Impressed-Inertial-Force** in this Homogenous Displacement (c = 1) , in **Unit Conductor** , d / r .

The Total-Energy in caves is $L = \vec{B} \vec{w} = \frac{I.w}{2} w = \frac{\pi r^4}{2} [2\pi f]^2 = 2\pi^3 r^4 f^2 = r mv = (r m) . wr$, and from radians $wr = \sigma \Phi$, or $\rightarrow w = \frac{\Phi . \sigma}{r} = \frac{c}{d} = \frac{\Phi . \sigma}{AK_A} = - \frac{\Phi . \sigma}{KA_A} \leftarrow$ Are created The Particles and Anti-Particles.

i.e. **The Quantum of motion** is $\vec{q} \equiv |\vec{e}| \times \frac{3}{3}$, equal To The Transverse-motions $|\vec{Q} \times \vec{Q}| \equiv$ **Stress** σ on **Unit-Energy-Vectors** and is related to Spin S as $[\frac{cS}{r^2}] . |\vec{Q} \times \vec{Q}|$. **With this Way** , Nature following [TPSS]-Geometry-Mould Produces **The Unit-Geometry-Plane** $\pi . [\frac{CO}{\sqrt{2}}]^2$ Equal to the Area of Circumscribed-circle , and on the same Mould **The Energy-Volume-Unit** $CO^3 . [\vec{Q} \times \vec{Q}] \equiv 2 . \text{Sphere} \frac{4\pi}{3} r^3$, And

Equivalent To Energy - Sphere - Cone { $\mathbb{C} = k \pi r^3$. (o.e.δ),(q.e.d) .Figure-60 .

The Two-Vectors v_1, v_2 , in **E-Geometry** consist area $A = |v_1| \cdot |v_2|$ and Three Volume $V = |v_1| \cdot |v_2| \cdot |v_3|$, consist an Square - Prism , a Cube while for **Material-Geometry** $\bar{v}_1 + \bar{v}_2 = R\bar{v}_{1-2} = \text{Resultant } \{\sqrt{|\bar{v}_1|^2 + |\bar{v}_2|^2}\} \cdot [R\bar{v}_{1-2}]$ and Volume $= |v_1| \cdot |v_2| \cdot |v_3| \equiv |R\bar{v}_{1-2}| \cdot |\bar{v}_3| \equiv |R\bar{v}_{1-2-3}| \equiv |R\bar{v}_{1 \rightarrow 2 \uparrow - 3 \downarrow}| \equiv$ The Vertices of the **Regular-Tetrahedron** of the Four triangular faces , 123 , R12 , R23 , R31 and which is **The First Solid Structure in nature** .

In (7) Energy Volume is $V_{E-A} = [\vec{CO} \times \vec{CB} \uparrow] \times \vec{CO} \downarrow \uparrow \equiv \frac{1}{3} \text{Base} \times \text{Height} = \frac{1}{3} \frac{r^2}{2} \times r = \frac{r^3}{6}$

In (8) Energy Volume is $V_{E-N} = [\vec{CH} \times \vec{CM} \uparrow] \times \vec{CH} \downarrow \uparrow \equiv \frac{1}{3} \text{Base} \times \text{Height} = \frac{1}{3} \frac{[\pi r^2]}{1} \times r \cdot \sqrt{\pi} = \sqrt{\pi} \cdot \frac{[\pi r^3]}{3}$

In (9) Energy **Anti-Volume** is $V_{E-K_A} = [\vec{CP} \times \vec{CA} \uparrow] \times \vec{CP} \downarrow \uparrow \equiv \frac{1}{3} \text{Base} \times \text{Height} = \frac{1}{3} \sqrt{\pi} \cdot \frac{[\pi r^2]}{2} \times 2r = -\sqrt{\pi} \cdot \frac{[\pi r^3]}{3}$

Remarks :

- 1... The Kinetic Rotational-Energy of The Energy- monad $\equiv$ **Quantum of Energy** $\equiv$ **The Sphere** $\frac{4\pi}{3} r^3$,
is The Work $\equiv$ **The- motion** in monad , and is the Scalar Quantity $W = 2E = B w$, or **$2E = 2\pi f B$**
- 2... The Vector Angular Momentum Quantity is $\vec{B}$, and the Vector Angular-Velocity-Quantity is $\vec{w}$, which
Three monads are related as $\vec{B} \cdot \vec{w} = 2L = J \cdot w^2 \equiv J \left[\frac{c}{r_m}\right]^2 = J \cdot [2\pi f]^2 = J \cdot [2\pi \frac{\sigma \Phi}{2\pi r}]^2 = J \cdot \left[\frac{\sigma \Phi}{r}\right]^2$
- 3... The Quantum of Energy $\equiv$ The Sphere $\frac{4\pi}{3} r^3 \equiv \vec{B} \equiv \vec{w}$ and is Double That of Monad-Total-Energy **L** and
this because , The Kinetic-Energy E_K changes to the Equal Potential-Energy E_U which are $E_K \perp E_U$.
- 4... Kinetic-Energy $E_K \equiv$ The Quantity $|Q_x|$ and Potential-Energy $E_U \equiv$ Quantity $|Q_y| \perp |Q_x|$.
For an Stationary-monad issues That of Duality-Photons $\rightarrow \vec{v} \cdot [\vec{f}_n] + f_n \equiv \left|\frac{v}{\pi^2 r_n^2}\right| \cdot [\vec{B}_n] + |\vec{c}| f_n \leftarrow$
Since EM - Waves Propagate as equations , $E_x = E_0 \cdot \sin[kz - wt]$, $B_x = B_0 \cdot \sin[kz - wt]$, Then
velocity $c = \frac{w}{k}$ **carries Energy-Vector $k = \frac{2\pi}{\lambda}$** in Wavelength λ , Therefore **Energy = Total-motion in λ** .
- 5... In Maxwell's equations on an Propagating Electromagnetic - Wave , The Electric-field Intension is E ,
Magnetic-field Intension is B , are Perpendicular each other and both to The Direction of Propagation,
or To The Capacitor C . E - field is $\perp$ Capacitor and , B - field is along The Perimeter of a circle and is
Parallel , $\rightleftharpoons$, To the Capacitor , from where issues $B \perp E \perp C$, and it is The EM - Wave .
- 6... **Electromagneti-Field** between Two Points 1 , 2 , is the Work $W = \int P \cdot ds = Q \Rightarrow \frac{1}{1 \rightarrow 2}$ done Per-Unit-
Charge in taking it from Point 1 to 2 . EMF = Electromotive-Force = Power = $\frac{\text{Energy}}{\text{Charge}} = \frac{V \cdot (q = it)}{i \cdot t} = V I$
 $\equiv$ Voltage x Current $\equiv [\oplus \rightarrow AK_A \leftarrow \ominus] \times [\text{Ampere/Second}]$.
- 7... **Electromagnetic-Waves** Oscillating in Spaces can Sustain each other . The Waves which have wavelength
 $\lambda = v \cdot T = \frac{c}{f} = \frac{2\pi}{k}$ with an frequency f and Any Energy-Wave-Vector k , could be Refracted , Reflected
and Polarized . From relation $\pm$ Spin $\vec{B} = J w = \pi^2 \cdot r^4 \cdot f_n = \pi^2 \cdot r^4 \cdot \left[\frac{\sigma \Phi}{2\pi r_n}\right] = \frac{\pi r^3 \Phi \cdot \sigma}{2}$ and wavelength
 $\lambda = c / f$, is seen That Electromagnetic Waves carry Momentum = Spin = $\vec{B}$, Therefore Squeeze in the
Radiation-Pressure $\sigma = \frac{2\vec{B}}{\pi \Phi \cdot r^3}$. From above implies that **Radiation is of Wave - Nature** .
- 8... Since Momentum-Ellipsoid , $\vec{B}$, is Perpendicular to , Angular - velocity - Ellipsoid , $\vec{w}$, NO Work is
Produced and the Status is Neutral . This Property issuing in Material- Point allows , Spin $\equiv \vec{B}$ Vector
and Velocity - Magnitude $\equiv \vec{w}$, be conserved as Total - Energy $2L = \vec{B} \cdot \vec{w} = J \cdot w^2$. In Material Point ,
and because of Rotation , Stretched-String Energy $\vec{B}$ 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 N - Antinodes . **Above Properties uses Nature in Medicine , for Immune Systems** .

By considering Rotation as a grating having N-lines Per , r , Then maximum values of , n , is $n < \frac{1}{N\lambda}$,
For $\lambda =$ The Step of the grating , which may be considered as an cave or as an Bound of motion , **i.e.**
The biggest whole number less than $\frac{1}{N\lambda}$, which is always Integer , and the N-loops are the N-Energy
Stores in Material-Point . This is the Why Spin is , $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, ... $\frac{1}{N}$, followed in Quantization as
One , Half , Third... $\frac{1}{N}$ - Lengths , $[\frac{1}{2}, \frac{1}{2}]$, $[\frac{1}{3}, \frac{1}{3}]$, , $[\frac{1}{N}, \frac{1}{N}]$, with One , Two , Three , , N-Wave-Nodes.

K.. THE STABILITY OF THE PRIMARY , SPACE , ANTI - SPACE SYSTEM :

Generally , Stability is the State of that Geometrical Formation , **The System** , of being Resistant To the

Opposite changes .This Geometrical Formation , is the STPL – Circuit Mechanism which equilibrium Axially $[\oplus \leftrightarrow \ominus]$ and Rotationally $[\oplus \cup \ominus]$, using The **Three Elements $\equiv$ Digits** of Material-Geometry and which are $\{ \oplus , [\oplus \leftrightarrow \ominus] , \ominus \} \equiv [+ , 0 , -]$.

All motions result to Central-Forces and Conic Sections Figures [75] It was shown that **In Conservative Systems** of Central-Force ,The Total energy **E** is conserved at Periapsis ,and Energy $E = \frac{GMm}{2a}$,

The eccentricity $e = \sqrt{1 + 2EL^2/G^2M^2m^3}$,which for $e = 0$, **a circle** , becomes $E = -\frac{G^2M^2m^3}{2L^2}$, **i.e.**

Total-Energy is always Negative .From Hydrogen cave issues motion $k = E = \frac{T^2}{a^3} = g = [\frac{4\pi^2a}{GM}]$ therefore

$GM = \frac{4\pi^2a}{g}$ and from Total-Energy $E = -\frac{GMm}{2a}$, The Rotational - Momentum $L = \sqrt{(1 - e^2).GMm^2.a}$

For eccentricity $e = 0$, $GMm = -2aE$, and then $\rightarrow L^2 = GMm^2.a = -2aE[a]m = -2a^2.E m$.

i.e. Equation $L^2 = -2a^2.E.m$, denotes that Angular- Momentum $L \equiv B$ in the Circular Orbit Rims is always Negative and equal to Spin $\rightarrow L = -a\sqrt{2Em}$, while Total - Energy $E = -L^2 / 2ma^2$. From , Kepler's laws and Newton's Lagrange laws for Mechanics in an Equivalent System ,

The change of Space is **Velocity** $\dot{r} = \sqrt{\frac{2}{m}[E - V(r) - \frac{L^2}{2mr^2}]} \equiv \sqrt{\frac{2}{m}[E - \{\frac{k}{r} + \frac{L^2}{2mr^2}\}]}$, and from area

$A = TL / 2m = 2a b$, where **T** is the Period of Orbital rotation and $b^2 = a^2 - (ae)^2$ and from Kepler laws

$$\text{Ratio } \frac{T^2}{a^3} = \frac{4\pi^2m}{2E} = \frac{4\pi^2}{2E/m} = \frac{4\pi^2a}{GM} , \text{ or } T^2 = \frac{4\pi^2a^3}{GM} = \frac{1}{f^2} \dots\dots \text{constant} \dots(6)$$

Energy $E = \frac{1}{2}m\dot{r}^2 + \frac{L^2}{2mr^2} - \frac{GMm}{r}$, $L = m.r^2.\dot{\theta}$ (7) and it is the **Energy in cave and for Atom** ,

The **First - Term** is the Kinetic - Energy of the Planet on Orbit ,

The **Second-Term** is the Constant - Rotational-Energy OR the Spin of Atom ,

The **Third -Term** is the Constant - Gravitational-Potential-Energy . and the moving or Not Total

$$\text{Constant-Energy } k = E = J.[\pm w]^2 = J[\frac{\lambda f}{r}] = J[\frac{2rf}{r}] = J[2f]^2 = 4J.f^2 = [\frac{\pi.r^4}{2}]\{\frac{\sigma^2\Phi^2}{4.\pi^2r^2}\} = \frac{[\sigma.\Phi.r]^2}{2\pi} = \frac{h}{2\pi}$$

From The Euler-Analysis of Motion in Orbits ,

$\bar{B} [B_1, B_2, B_3] \equiv \bar{S} [S_1, S_2, S_3] \rightarrow$ The Angular-Momentum - Vector $\equiv$ Spin.

The Energy Relations :

$$\bar{B} = J_1w_1\bar{i} + J_2w_2\bar{j} + J_3w_3\bar{k} \dots\dots\dots (16)$$

$$B^2 = J_1^2w_1^2 + J_2^2w_2^2 + J_3^2w_3^2 \dots\dots\dots (16a)$$

$$\bar{B}_w = Jw^2 (= 2L) = J_1^2w_1^2 + J_2^2w_2^2 + J_3^2w_3^2 \rightarrow \text{It is The Ellipsoid of Angular-velocity Vector .}$$

$$L = \frac{B_1^2}{2J_1} + \frac{B_2^2}{2J_2} + \frac{B_3^2}{2J_3} = \text{The Constant-Angular-velocity-Momentum-Ellipsoid} \dots(17) \quad \text{i.e.}$$

$\rightarrow$ For any radius OP of $\bar{w}$ - **vector** exists another radius of $\bar{B}$ -**vector** Perpendicular to , The $\bar{w}$ - **edge** Tangential-Plane of the Angular-Vector-Ellipsoid , and The $\bar{w}$ -vector is Perpendicular To the $\bar{B}$ - **edge** Tangential- Plane of the Angular - Momentum- Vector Ellipsoid $\leftarrow$.

In case of Zero - Moment , related to the equilibrium Point O , Then ,

The motion of a Solid Body is Identical to the Rolling of the PO - $\bar{w}$ - Vector-Ellipsoid

[OP] in E-Tangential to Ellipsoid [$\bar{B} = OT \perp E$] Vector . [70]

Electron-Spin is the Angular-Momentum-Vector , $\bar{B}$, and rotates according to equation

$$\frac{dB}{dt} = [\bar{u}\bar{B}] = u.B.[\bar{k}\bar{k}'] \text{ in Gravitational Potential } U_g = [mg].s.\cos\theta = -s.Q.[\bar{k}\bar{k}'] , \text{ so the change of}$$

angular Momentum $\bar{B}$ is , $\frac{dB}{dt} = u = \frac{s.Q}{B} = \frac{s.Q}{J_3.w_3}$ and from 1-degree equation of motion u is $\ddot{u} + w^2u = 0$

and the solution **Period of Nutation** $T = \frac{2\pi}{u} = \frac{2\pi.J_3w}{sQ}$, and natural **N-Frequency** $f_N = \frac{sQ}{2\pi.J_3w} \dots(1)$

$$\text{with Total Energy of Nutation [70] , } E_N = \frac{J_1}{2}[w_1^2 + w_2^2] + \frac{J_3}{2}w_3^2 \dots\dots\dots(2)$$

It was proved that in material Point ,[86].P-48, $2L \equiv \bar{B}\bar{w} \equiv h.f$, $|w| = \frac{\sigma}{2r}[1 + \sqrt{5}]$, and $f = \frac{(1 + \sqrt{5}).\sigma}{4\pi r}$

$$\text{Angular momentum } \bar{B} = \frac{2L}{w} = \frac{2L}{2\pi f} = [\frac{L}{\pi}][\frac{1}{f}] = \frac{4r.L}{(1 + \sqrt{5}).\sigma} = [\pi r^3\sigma(1 + \sqrt{5})/2] = \frac{\pi^2r^4.f}{2} \dots\dots(b)$$

From (a) , (b) the Angular – velocity - Ellipsoid , $\bar{w}$, is the analogous to the circular current , I , and

Angular – Momentum - Ellipsoid $\bar{B}$, is the analogous to the Torque , $\bar{\mu}$, on this circular loop so

$$\bar{\mu} = I \cdot A = \frac{\text{Energy}=\text{Motion}}{\text{Unit-Time}} = \frac{I \cdot A \cdot s}{s} = \bar{B} = \frac{2L}{w} = \frac{2L}{2\pi f} = \left| \frac{L}{\pi} \right| \cdot \left| \frac{1}{f} \right| = \frac{4r \cdot (hf)}{(1+\sqrt{5}) \cdot \sigma} = \left[\frac{h}{2\pi} \right] = \text{SPIN} \dots (c) \quad \text{i.e.}$$

The Magnetic – moment $\bar{\mu}$ of the Material – Point = $\left[\frac{h}{2\pi} \right] \equiv \text{SPIN}$, and also equal to

$$\text{The Angular-Momentum-Vector } \bar{B} = \pi^2 \cdot r^4 \cdot f = \frac{\pi r^3 \sigma}{2} [1 + \sqrt{5}] \equiv \pi r^3 \cdot \sigma \Phi \equiv \left[\frac{h}{2\pi} \right] \equiv \frac{2L}{2\pi f}.$$

It was shown that, When motions, B, w, are Constants, Then from Poincaré's solution issues, $J_a^2 = J_2^2 y^2 + J_3^2 z^2$, $J_a = J_2 \cos^2 \varphi + J_3 \sin^2 \varphi$, and The constant motion = Energy is done in a circle. It was shown that The Stability of Any Forces-System is succeeded in caves or in Opposite-Vectors.

The Electric Forces :

Electric-Force, $\leftrightarrow$, Is the Dominant where Particles are responding To The Constructive

$\{ [\oplus \rightarrow (+) \leftarrow \oplus] \text{ or } [\ominus \rightarrow (+) \leftarrow \ominus] \}$, And To **Destructive** $[\oplus \rightarrow (-) \rightarrow \ominus]$ Interference as,

Constructive $[\oplus \rightarrow \oplus = \oplus \oplus] \equiv CI_{=+1}^{+,+} \equiv W^+$, ... $[\ominus \rightarrow \ominus = \ominus \ominus] \equiv CI_{=0-}^{-,-} \equiv W^-$,

Interference $\rightarrow [\oplus \rightarrow \oplus = \oplus] \equiv CI_{=+n}^{+,+} \equiv W^{++}$, ... 3-Types of CI-Forces.

Destructive $[\oplus \rightarrow \ominus = 0_+] \equiv DI_{=0+}^{+,-} \equiv Z^+$, ... $[\oplus \rightarrow \ominus = 0] \equiv DI_{=0}^{+,-} \equiv Z^0$,

Interference $\rightarrow [\oplus \rightarrow \ominus = 0_-] \equiv DI_{=0-}^{+,-} \equiv Z^-$, ... 3-Types of DI-Forces.

With the above Mould are Originated All Types of Elementary-Forces, Strong and Weak.

From equality $G = \sigma \cdot \Phi^3$, is seen The Quantum - Chromodynamics, dependent on stress σ , and on Harmonic - ratio Φ , while the Quantum Electrodynamics Origin on Exchange Forces.

In each wave of, f, frequency and Newton-Force $F = - \left[\frac{32\pi m f^2}{r^5} \right]$ corresponds a stress $\sigma = \frac{F}{A} = \frac{2\pi r f}{\Phi}$,

For a difference of cave $r = 0,1 \cdot 10^{-18}$ then Force differs $F_{0,1} = 0,1 \cdot 10^{-5} \cdot 10^{-18} = 10^{-24}$

Because Force can't exist by itself there must always be an equal and Opposite Reaction Force, acting on the Opposite Position or Direction. **Coulomb - Force** acting between Two Particles is $F_c = C \frac{q_1 \cdot q_2}{r^2}$ while The **Voltage** is $V_r = C \frac{q_1 \cdot q_2}{r}$ of cave, $r \equiv r_{\text{conductor}}$, and it is $\rightarrow V_r = F_c \cdot r \leftarrow \dots (v)$

It is shown that The Stability of Electric-Forces is succeeded in The common-caves, r, of Interference.

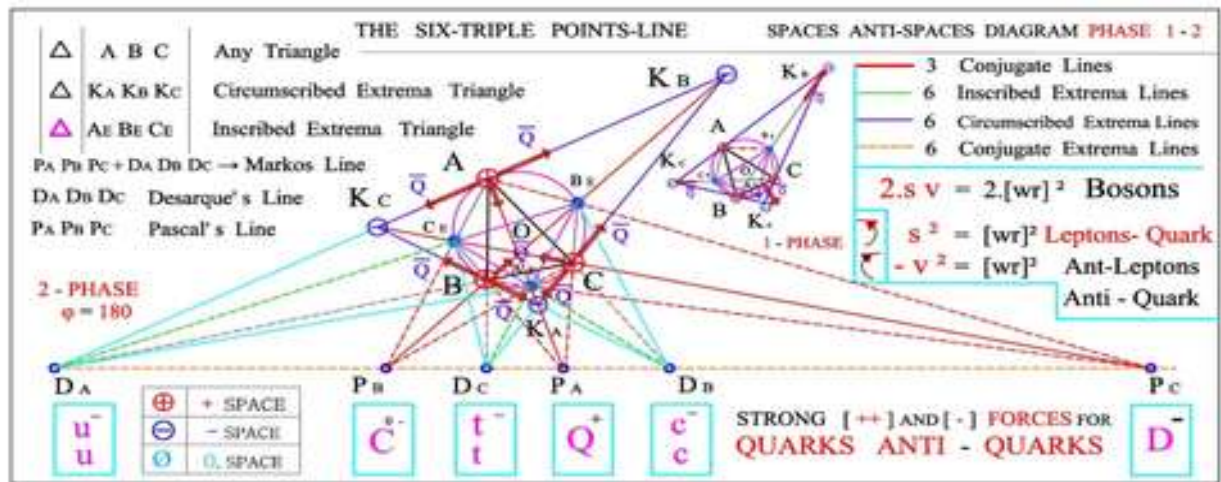


Figure - 26 : The Physical-Rotor in [STPL]-Mechanism Produces at Pascal's and Desargues Points

$P_A, P_B, P_C \leftrightarrow D_A, D_B, D_C$, The **Strong - Forces** in Pascal's Points and Strong **Quarks** $q = \frac{2}{3}$, and **Anti - Quarks** $q = - \frac{2}{3}$

It was shown that The Stability of **Strong- Forces** is succeeded in The launched- Pascal's - caves r . For **Energy-Vectors** at Point-Say A, issues, $\overrightarrow{AK_A} = \overrightarrow{KA_A}$ and $\angle \overrightarrow{AK_A}, \overrightarrow{KA_A} = 60^\circ$ and form the **Resultant-Vector** $\overrightarrow{CK_C}$. As in Electricity, where The Magnetic field created by the flow of current in an Conductor, represents The Perpendicular-Lines of Forces, Similarly Material-Vector $\overrightarrow{CK_C}$, carries the **Conjugate-Force** $\overrightarrow{AB}$ from **Screwdriver** Inscribed to, $\overrightarrow{CA}, \overrightarrow{CB}$ Circle $\equiv \pi \left[\frac{CA}{2} \right]^2 \equiv \pi \frac{CA^2}{4}$, To the Circumscribed-circle $\pi \left[\frac{CA\sqrt{2}}{2} \right]^2 \equiv \pi \frac{CA^2}{2}$, equal to **CMNH Square**, and To the Double-Area circle, $\pi \cdot [CC_E]^2 = 2 \cdot \left[\pi \frac{CO^2}{2} \right]$ as in Figure-59. This Property of **Vectors** at Point A issues for any Point, which can have a **Screwdriver - Material-vector- PO**.

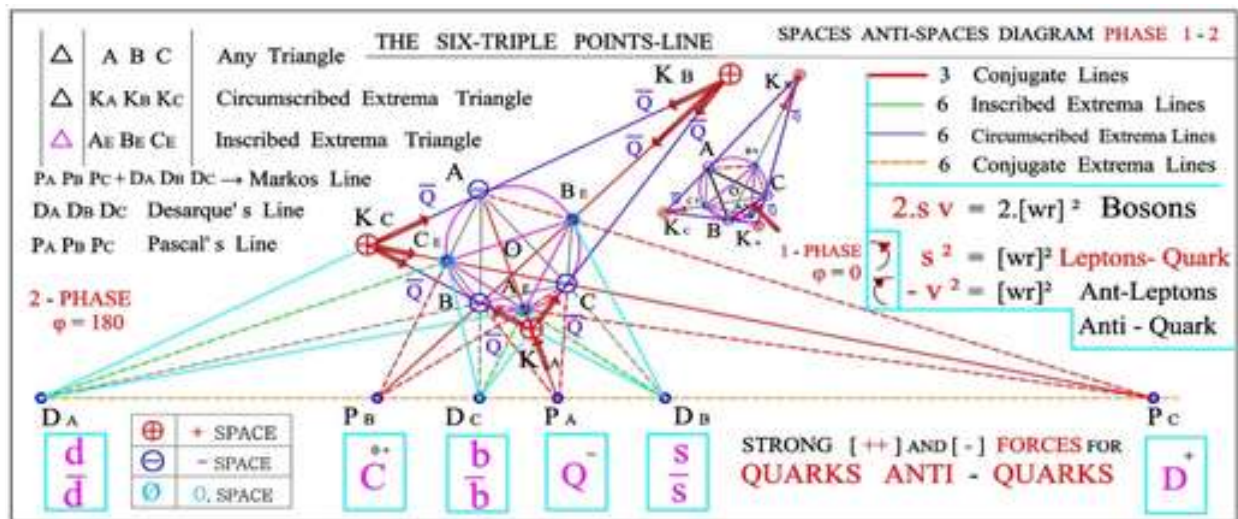


Figure - 27 - : The Physical-Rotor in [STPL]-Mechanism Produces at Pascal's and Desargues Points $P_A, P_B, P_C \rightarrow D_A, D_B, D_C$, The Strong - Forces in Pascal's Points and Weak - Quarks, $q = \frac{1}{3}$, and Anti - Weak-Quarks $q = -\frac{1}{3}$

It was shown that The Stability of Strong - Forces is succeeded in The launched- Pascal's - caves r , While Quarks from their Anti - Quarks in the launched - Desargues - caves r .

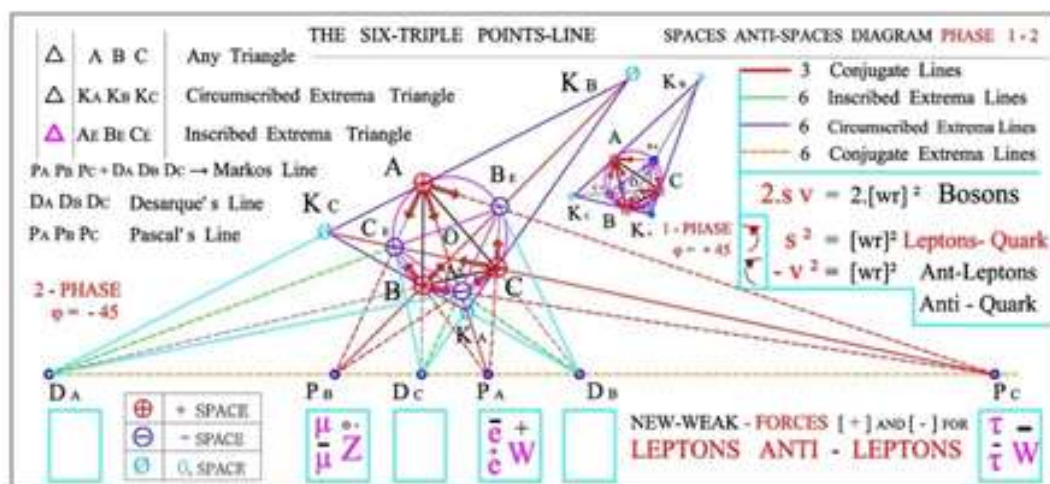


Figure - 28 – The [STPL]-Mechanism Produces the Weak-Forces, Leptons and Anti-Leptons : [F + L] Interactions of Space, Anti-Space for Forces, Strong-Leptons $q = -1$, Origination.

It was shown that The Stability of Weak - Forces is succeeded in The launched- Pascal's -caves r , While Leptons from their Anti - Leptons in the same launched - Pascal's - caves r .

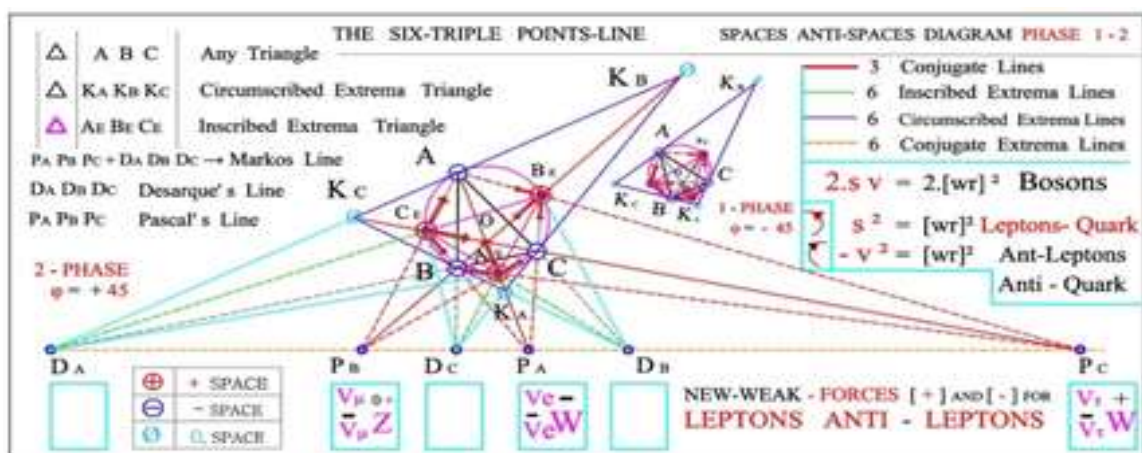


Figure - 29 - : The [STPL]-Mechanism Produces the Weak-Forces, Leptons and Anti-Leptons :

[F + L] Interactions of Space , Anti-Space for Forces , Weak-Leptons $q = \pm 0$, Origination .

It was shown that **The Stability of Weak - Forces** is succeeded in The launched - Pascals - caves r , While Leptons from their Anti - Leptons in the same launched - Pascals - caves r .

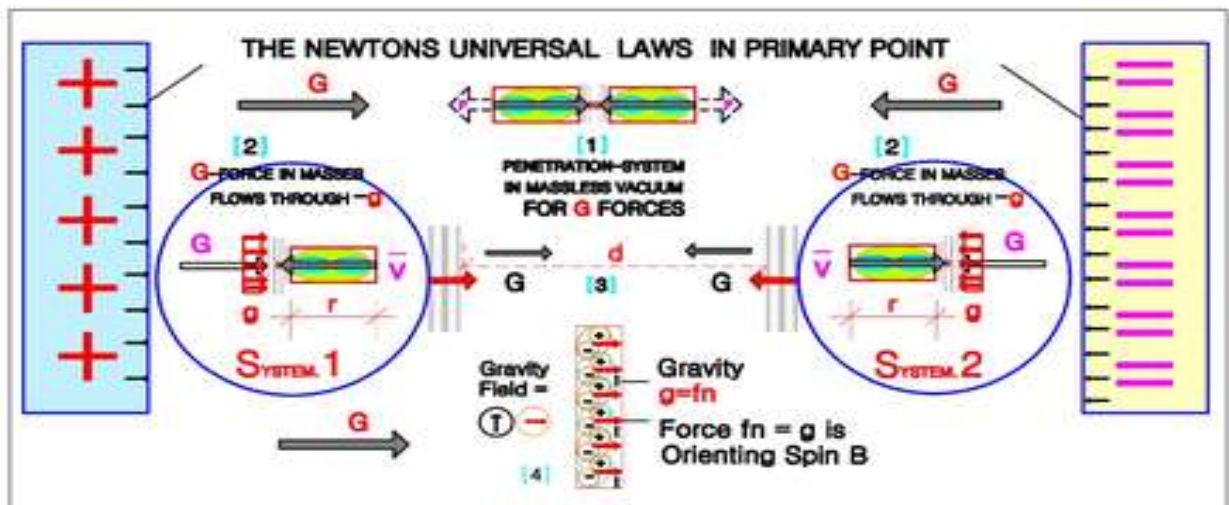


Figure – 17. The Newton's Universal Laws in **Primary – Material - Points** of Cosmology :

Above figure , is consisted of Two – Primary–Opposite - Spaces , $\{+\} \rightarrow d \leftarrow \{-\}$, **The Poles** with Infinite Points for **Parallel - lines** such that , G , is a **Uniform-Pointy-Force – Magnet**, in an $r = \infty$ circle of the STPL - Mechanism and which is the **mould** for the **construction of The Elementary Particles** . Material Point , the Photon And **Photon - Charge** with Light velocity c , the **Gravity g** , the Electrons e And **e-Charge** as Hydrogen cave **ARE - ALL** under the **effect of Gravitational constant G** Force , being the Opposite-Polarity Charges $\oplus$, $\ominus$, on the $d = \infty$ Capacitors Plates distance .

In Mechanics , a force F produces the Work W , when it removes the Point of its action from an Position , A , to another Position B , as the Work of equation , $W = F \cdot ds$, where $ds = |AB|$ the displacement . This right definition automatically defines that **All this Work done** and exists into The whole Universe , **as Space and as Energy** , has been Produced by this Unique force G only .

It was Proved [82] that this force is , **The Newton's Gravitational force G** , and equal to $G \equiv \sigma \cdot \Phi^3 \equiv \Phi^2 \cdot \{ \sigma \Phi \} \equiv \left[\frac{2B}{\pi r^3} \right] \equiv 2\pi f_p r \equiv w r \equiv \bar{v} \equiv m a = m g = \bar{c}$ i.e. is Related To ,
 $a \dots$ To Stress σ , $b \dots$ To Spin $\bar{B} \equiv \bar{S}$, $c \dots$ To frequency f and cave r , $d \dots$ To Velocity $\bar{v}$,
 $e \dots$ To Angular-velocity w , $f \dots$ To mass m and acceleration g , $g \dots$ To All -Types of motion

In-(1) The motions occurs from Positive to Negative as , $\oplus - d - \ominus \equiv \rightarrow \overrightarrow{AK_A}$, in the In - between Displacement. The **Inner-Connectors** $[AA_E, BB_E, CC_E]$, $[A_E A, B_E B, C_E C]$, follow the **Ptolemy's - Theorem** and The **Outer – Connectors** $[AK_B, CK_A, BK_C] = [AK_C, BK_A, CK_B]$, follow the **Ceba's - Theorem** for Equilibrium .

In-(2) Equilibrium of the Three - Spaces is succeeded on the Physical Cyclic-Quadrilaterals-Circuits $(AB_E A_E C_E), (BC_E B_E A_E), (CA_E C_E B_E)$, **Linearly** through **The Products** of Diagonal-connectors **as** $[AA_E] \cdot [B_E C_E] = [AC_E] \cdot [A_E B_E] + [AB_E] \cdot [A_E C_E]$, $[BB_E] \cdot [C_E A_E] = [BA_E] \cdot [B_E C_E] + [BC_E] \cdot [B_E A_E]$, $[CC_E] \cdot [A_E B_E] = [CA_E] \cdot [B_E C_E] + [CB_E] \cdot [C_E A_E]$, which is **Ptolemy's theorem** and ,

Rotationally through **the Ratio** of Diagonals , $\left| \frac{AK_B}{AK_C} \right| \cdot \left| \frac{BK_C}{BK_A} \right| \cdot \left| \frac{CK_A}{CK_B} \right| = 1$ or $\pm$ **Rotational - Torque-Balance of $\pm$ Spins** , as **Ceba's Equilibrium-Theorem** $[AK_B] \cdot [CK_A] \cdot [BK_C] = [AK_C] \cdot [BK_A] \cdot [CK_B]$ of all above Opposites which are Moments , or The $\rightarrow$ **Tangential – Electromotive – Forces** .

In the referred , **Ptolemy's and Cebas Spaces Mould** , when is Placed , **motion $\equiv$ Energy - Vectors** , **Exists** , **The Energy - Space Universe** , which **Stability is Self – Contained** from its **Structure** of **The Space** , and **Anti-Space existence** . Above , **Mould** , issues for all Systems of nature which in some way have motion as in Electric Generators . For more analysis in [56-60] .Markos 7 / 5 / 2021.

In-(3) The **Inner - Connectors** linearly Equilibrium , while the **Outer-Rotational -Conductors** **Equilibrium** from the $\{\oplus\text{-Space [A B C]}\}$, $\{\ominus\text{-Anti-Space [K}_A\text{ K}_B\text{ K}_C\text{]}\}$ opposition ,where is created the Strongest-Tangential-Forces for $\pm$ Spin .**{ { WHEN the above Oscillating-Inner-System W_R , with all The-Diagonal Linear Electromotive Coulomb forces F_C , Due to the $\oplus$ Charges which directly effect on the $\ominus$ Charges , and which is RESONATED with That of Angular – Momentum $\equiv$ SPIN , $\bar{S}$. Spin becomes from The –Tangential – Electromotive – Forces , and from Coulomb ELECTROMOTIVE-FORCES , these become Equal to the Centrifugal –Inner- Connectors - Forces - } }**.

The **CENTRIFUGAL - FORCE** , which is created from the Rotated System of Cebas 2-3-Phase **Tangential–Phase-Forces** , **PUSHES** the Inner **COULOMB-FORCES** created from Opposite $\pm$ charges , **OUTWARDS** of **SYSTEM** .

The **Centrifugal-Coulomb-Forces** , created after motion , **ARE The Elementary-Particles** , and The **Equilibrium –Tangential - Forces** IS their $\pm$ **Spin $\bar{S}$** , which Equilibrium the equal Rotation. From **Lorentz-Force** , $F = \bar{q} \bar{v} \times \bar{B}_F$, where , $\bar{q} \equiv$ Charge , $\bar{v} \equiv$ The velocity of Charge , $\bar{B}_F \equiv$ The Strength of Magnetic field then Centrifugal Force , $F_{CF} = m \cdot \omega^2_R \cdot r$, and from Cave-Spin , $\bar{S} = r m v$, then mass $m = (\frac{S}{r \cdot v})$. Equating equations then , $F \equiv F_{CF} \equiv \bar{q} \bar{v} \times \bar{B}_F$, and $Q_{\pm} = m \cdot \omega^2_R \cdot r = (\frac{S}{r \cdot v}) \cdot \omega^2_R \cdot r = \frac{S \cdot \omega^2}{v} = \frac{S \cdot v^2}{r^2 \cdot v} \equiv \frac{v \cdot \bar{S}}{r^2} \dots (EMF)$, **i.e. Electromotive-Forces** , $F = \bar{q} \bar{v} \times \bar{B}_F = Q_{\pm} = \frac{v \cdot \bar{S}}{r^2} \equiv |\frac{c \cdot \bar{S}}{r^2}|$, **are The Elementary-Particles** { $F \equiv$ Forces , $L \equiv$ Leptons , $Q \equiv$ Quarks } .

It was shown that **The Stability** of the Infinite **Uniform-Pointy-Force-Magnets**. is succeeded through Their Physical – Conductors $r_{1 \rightarrow \infty}$, While for Systems S_{1-n} , through their **Inner-Gravity** from G , on their Electrons in caves r , and in Open Space through the **Duality-Photons** as is Conductor λ , and as Waves the frequencies , $f_{N=1-n}$, for all motions .

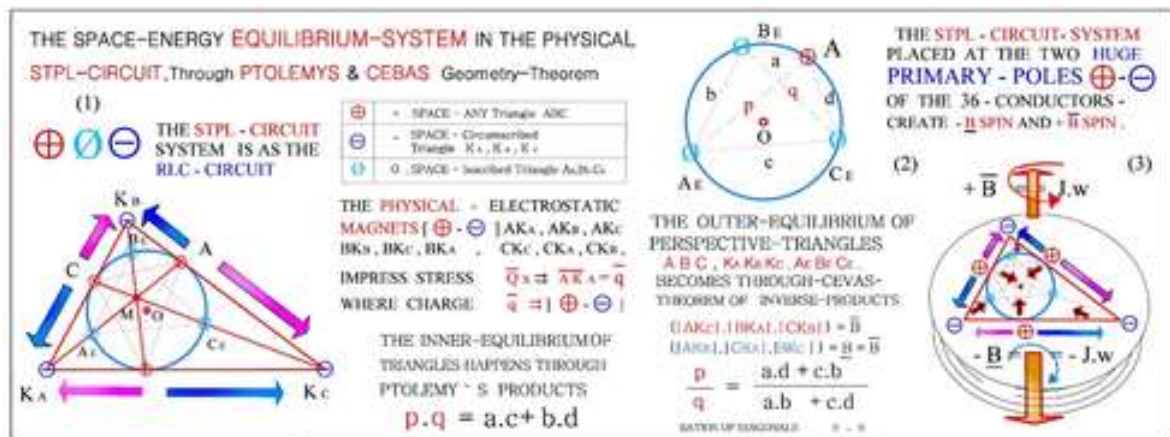


Figure - 61- : The Stability of $\rightarrow \{\oplus\text{-Space [A B C]}\}$, $\{\ominus\text{-Anti-Space [K}_A\text{ K}_B\text{ K}_C\text{]}\}$, and of **Sub-Space** { $[\oplus \leftrightarrow \ominus] \equiv ds \equiv [\oplus \leftrightarrow ds \rightarrow \ominus]$ – or – **The Neutral-Space** [A_E, B_E, C_E] } $\leftarrow$
It was shown that , **The Stability of Forces** , is succeeded in **The Pascal's** -launched-caves r ,
While **Leptons** , from their **Anti - Leptons** existence in the same launched –Pascal's-caves r .

Remark :

- 1... Any Two $\oplus, \ominus$, Charges Placed at a distance , d , consist a Di-Pole which is a Physical magnet $[\oplus \leftrightarrow \ominus]$ and for, **Primary-Charges** , is a **Huge Electrostatic - Magnet** .
- 1-a.. **The Stability** of the Two $\oplus, \ominus$, Opposite-Poles exists by their Inbetween E - Conductor $|\oplus d \ominus|$, which its Stress σ , becomes from $k d = E = |\frac{c \cdot \bar{S}}{r^2}| \cdot \left| \frac{3}{3} [\overrightarrow{AK_A}] \right| = \left| \frac{\sigma \cdot (c \cdot \pi r) \cdot \Phi}{2} \right| \cdot \left| \frac{3}{3} [\overrightarrow{AK_A}] \right|$.
- 2.... In Conductor $|\oplus d \ominus|$, and according to - **Space** , **Anti-Space Positions** - are created The **Primary Forces and Particles** , occupying The Direct $\Rightarrow$, and Transverse motion $\Uparrow$, where this constant k the-motion is Placed in an , **Conductor $\equiv \lambda$** , consisting **The Electromagnetic Wave** [$Q_x \perp Q_y$] .
- 2-a.. **The Stability** of the , **Space Anti-Space Circuit** , exists by their $2^2 \cdot 3^2 = 36$ **Positions = Conductors** of the Two charges , $\oplus, \ominus$, and of the Three elements $\rightarrow \{\oplus, [\oplus \leftrightarrow \ominus], \ominus\} \equiv [+ , 0 , -]$ $\leftarrow$
- 3... Energy in Conductor is , **The Second** , $n = 2$, **Isochromatic fringe order** , $E = [\frac{4 \pi r^2}{3}] \cdot f_1 \cdot [n=2]$, of ϕ .

L.. EPILOGUS :

IT WAS PROVED and ELUCIDATED THAT ,

- a.. Monad is Quaternion $[x + iy] = \bar{\lambda}$, and its Energy is The Vector $\vec{Q} = \{\lambda\}.X$,where X = The Displacement
- b.. Energy is the Work , The motion , Produced in Energy-monads and Equal to $W = 2L = \vec{B} \cdot \vec{w} = J w^2 \equiv$
Photon $= [\vec{k}_x \perp \vec{k}_y]$ where $\vec{k}_x = \vec{k}_y$ in Conductor $\vec{AK}_A = 2.r \equiv \lambda$ and , λ , Is-The -Wavelength .
- c.. In Mechanics an **Energy-Vector** is an **Conductor** $\vec{AK}_A = |\vec{Q}|_{\pm}$, as is The Quaternion in Material-Geometry on where motion is Transferred from One Edge Point A , To the Other Edge Point $K_A \rightarrow \vec{Q}$, $\vec{Q}_x$, $\vec{Q}_y$,
- d.. It was Prooved That $\rightarrow$ Any **Diameter D** , of a circle in the **STPL – Circuit** , the **Three –Poles –Squares – Rotational - System** is an **Conductor** and $D = \vec{AK}_A = |\vec{Q}|_{\pm} = |\frac{cS}{r^2}| = I_E$ = The-Electric-Wave-Intensity, And $A \uparrow K_A \equiv I_M$ The- Magnetic-Wave Intensity and Their **Square -Vectors** $= [\vec{AK}_A] \times [A \uparrow K_A] = [\vec{Q}_x \vec{Q}_y] =$
 $=$ The **Energy - Square** $\equiv CM \times CM = CMNH$ on circle (E , EA) , and in Space **Energy - Volume** $\equiv$
 $[\vec{AK}_A] \times [A \uparrow K_A] \times [D] = CMNH \times \vec{Q} \rightleftharpoons CMNH \times \vec{Q}_{\rightleftharpoons}$, where $|\vec{Q} \rightleftharpoons| \equiv \vec{q}$,The Energy-Quantum.
In The Propagating Electromagnetic Wave $|I_E \perp I_M|$.
- e.. Since motions , $\vec{B} \times \vec{w}$, are Constants from (b) and from Poinot's solution $w_1^2 + J_2 w_2^2 = a^2$, Then Angular velocity-Ellipsoid Polar-Paths are **Parallel circles** and Perpendicular to Angular-Momentum Ellipsoid Nibs..
- f.. When is found an **Obstacle at Point K_A** ,Then The Particles of Conductor medium **Oscillate** Perpendicular. This Obstacle at K_A Point , is The Presentation of the , $\oplus$ constituent and the Absent of $\ominus$ constituent and so $\pm$, Transverse- Propagating-Wave , Or moving Energy-Vector , $|\oplus Q \uparrow \vec{AK}_A| = |\downarrow|$ at Node K_A **Is Equal** to E-Vector $|\oplus Q \rightleftharpoons \vec{AK}_A| \equiv |\leftrightarrow|$ at Node A and Energy Volume is Doubled , $2L = \vec{B} \cdot \vec{w}$, in $\vec{K}_A A$ Conductor .
The Reaction to motion of Squares $\{Q_{X=CO} \rightleftharpoons x|Q_{Y=CB} \uparrow\} \equiv |\vec{Q} \rightleftharpoons| \equiv |\frac{cS}{r^2}|$. $|\vec{Q} \rightleftharpoons|$ is equal to Quantum $\vec{q}$.
- g.. When The Two Perpendicular **Energy-Vectors** , $|\vec{Q} \rightleftharpoons \vec{AK}_A| \equiv \leftrightarrow$, $|\vec{Q} \uparrow \vec{AK}_A| = \downarrow$, of this Propagating Energy FORM The **Energy-Square** , $|\leftrightarrow| \cdot |\downarrow| \equiv |\vec{Q} \rightleftharpoons| \equiv q_0$, on Conductor AK_A ,Then Energy-Circular-Prism, $|\vec{AK}_A| \cdot \{ \vec{Q} \rightleftharpoons \vec{AK}_A \} \cdot \{ \vec{Q} \uparrow \vec{AK}_A \} \equiv [\vec{Q}_x \vec{Q}_y] \cdot |\vec{AK}_A| = |\leftrightarrow| \cdot |\downarrow| \cdot |\vec{AK}_A|$, i.e. **Energy-Circular-Cone** is a Moving Energy -Volume and **Because** from Cauchy equations of Stresses in three Dimensions , **The Energy Stress** remains Flat ONLY- WHEN the Plane-Section is a circle , and The Square becomes circle, **Anti-Quadrature**.
Because from Mechanics , The **Sphere** occupies The **Least-Resistance** to motion ,Then The Geometrical **Square –Cone** $[CM \times CH \times [\vec{CO} \uparrow]]$ is altered to **Equivalent Energy- Circular- Cone** $[\pi \cdot (\frac{CM}{2})^2 (x) [\vec{CO} \uparrow]]$ and To the **Energy Unit -Volume** $CO^3 \cdot [Q \rightleftharpoons] \equiv 2 \cdot \text{Sphere } \frac{4\pi}{3} r^3$ And To **Energy-Sphere Cone** $\mathbb{C} = k \pi r^3$, where The **Geometry- Cube** $[\leftrightarrow] \cdot |\downarrow| \cdot |\vec{AK}_A| = x^3$ becomes The **Energy -Sphere –Cone** $\rightarrow k \pi r^3 = x^3 \leftarrow$
- h.. It Was Seen That , Frequencies f_n are **The Quantum of Energy** ,and Electromagnetism is everywhere in nature from microcosm to macrocosm . **Distance** is the **Quantum of E-Geometry** , while **Material-Point** is the **Quantum in Physics** and in **Material-Geometry** which is the composition of Opposites and are the Elements in **Chemistry and Physics** . As in Algebra Zero ,0, is the **Master-key** number for all Positive and Negative numbers because their Sum and multiplication is Zero , and the same on coordinate - System , $\pm$, axes pass from zero .

The Rolling of Positive $\oplus$, constituent on the Negative $\ominus$, constituent , creates the Neutral Material Point which Equilibrium . **Spin $\vec{B}$** , is Its Angular momentum and also the **First-Discrete-Energy-monad** which occupies **Discrete-Value and Direction** , in contradiction to the Point which is nothing , *Dimensionless* and *without any Direction* . Point-caves Are the Energy-Magnets from which the Quantum of Energy are Generated .

- i.. The Space is **Quantized as Energy-Caves** under the effect of Gravitational-force G , as well in **Conductors** , and **Energy or motion is Quantized as Frequency in Energy-Caves** Or in **Conductors** , following Kepler's First-law of Equal Areas in equal intervals and in Conductors , as Electricity or Electromagnetic - Waves .

Quaternion $[(+)\cup\cup(-)]$ is a Quantum-Mould for Space $[(+)(-)]$ and Energy $\equiv$ motion $\equiv$ Force $\times$ Displacement as $[\cup\cup \text{ or } \uparrow \leftrightarrow \downarrow] \equiv$ Standing Box $B_Q \equiv$ An Material Point which carries the Principal Stress σ between Positions A (+) , B (-) , and σ , is the **Centripetal-acceleration** of minimum Energy becoming from the in-Storage AB acceleration and which is equal to the Gravity g . From Quaternion Quantum - Mould $[r + \vec{v} \nabla i]^{1/w} = e^{-i(\pi/2 + 2k\pi) \cdot w}$ is created the **min-Space** $\equiv$ cave $r = 1, 07 \cdot 10^{-7}$ m and the **min-Energy** $\equiv \vec{v} = w r = 2\pi f$, as frequency $f_m = 2,839844 \cdot 10^{10}$ H . G Pushes $\rightarrow$ min-Quantum-Energy $\equiv$ motion σ_E , into Inscribed-Cave

$\pi \cdot \left[\frac{CM}{2} \right]^2 \equiv \pi \cdot EA^2$. Gravitational-force **G** effecting on light velocity $\bar{c}$ creates Electron-charge $\bar{q}$ and Electron $\bar{e}$, while acting on Planck`s-cave the Gravity $g \equiv \pm \sigma$, as $G = g k = k_E g = k_L \sigma = g \cdot g_L k_L$, and $\bar{c}$ effecting on the min-Planck-cave in L_p formulates Hydrogen-cave **H** with its electron as H_e .

j.. The Physical-Notion of , The Duplication of the Cube , in The Quadrature Physical Energy-Mould **Shows**

that Nature follows Geometry-Rules in Order to Exist as Space and as Energy , which is motion of The ,+, Constituent to The , - , Constituent . This motion is conserved by Propagating in caves either for Standing $\equiv \left| \frac{v}{\pi^2 \cdot r^4_n} \right| \cdot \left| \bar{B}_n \right|$ or for moving caves as is the Duality - Photon $\rightarrow \bar{v} \cdot \left[\left| \bar{f}_n \right| + f_n \right] \equiv \left| \frac{v}{\pi^2 \cdot r^4_n} \right| \cdot \left| \bar{B}_n \right| + \left| \bar{c} \right| f_n$.

Material-Geometry meters for **Quantum-length** is the Quaternion $\equiv$ Dipole $\equiv$ The Two-Points joint with motion between them , while for The **Quantum-Surface** is The Unit circle $\pi \cdot r^2 = \pi$, and for $r = \text{Unit } 1$. For the **Quantum-Volumes** , is the. Unit Volume Sphere $\frac{4}{3} \pi \cdot r^3 = \left[\frac{4 \cdot r}{3} \right] (\pi \cdot r^2) = \frac{4 \pi}{3}$, for $r = \text{Unit } 1$.

The Unit-Volume is formulated from The Inscribed-Square of Unit Circle-Side $CO = CB = 1/\sqrt{2}$, and when Placed The-Unit-Energy-magnitude OC on Square $CO \times CO$ then is Unit-Volume $[CO \times CO \times \overrightarrow{CO} \uparrow]$. This Unit-Volume when Placed in , **The Three -Poles-Squares-Rotating-System** ,Then at Point K_N ,Unit Volume $[CO \times CO \times \overrightarrow{CO} \uparrow]$ becomes $[CM \times CH] \times \overrightarrow{CH} \uparrow = \text{Circular-Cone } [\pi \cdot (\frac{CB}{\sqrt{2}})^2] \cdot [\overrightarrow{CO} \uparrow] = \text{Unit - Sphere } \frac{4\pi}{3} r^3$ Equal to **Quantum** of Energy . Because Physical-Magnet $\oplus \Rightarrow \ominus$ compels Force $\bar{Q} \Rightarrow \overrightarrow{AK_A}$, Between A and K_A Points and Then **Unit-Sphere** $\frac{4\pi}{3} r^3$ becomes The **Double - Unit-Sphere** $2 \cdot \{\frac{4\pi}{3} r^3\}$ and because The Energy Square $[CAK_AP]$ is Double That the Unit Square $|CB \times CO|$ and Force $\bar{Q} \Rightarrow \overrightarrow{AK_A}$ is **The Pivot** of Spinning indicating $\pm \bar{B} \equiv \bar{S}$, in all Energy monads . Markos Georgallides 1 / 3 / 2020

This Property , $\pm \bar{B} \equiv \bar{S}$, in all Energy monads when **Applied on Initial , $\oplus \Rightarrow \ominus$, is The Answer To 3D-Stability** of All **Elementary - Particles and Cosmology – Equilibrium** . For more [97] .

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