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The Wave & Particle Duality- Photon Cosmic- Particles – Origination & Bonding

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Abstract
It was Prooved 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 {* ***is Quandized*** *} as an* ***Magnitude with Direction*** *. Energy is motion ,or any change on State of Space ,and is under the Restrictions of the Natural* ***Quaternions ≡ Real + 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 ≡* ***Energy*** *≡ 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 ± Charges +,-, so , these two Elements consist the Raw-Material of all* ***The-Energy-Structures*** *. Since equal Quantities Equilibrium , so issues [(+) –(-)] ≡ 0 , and this is the Material-Geometry [⊕ ,⊖, ∅] 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 Oscillation creating 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 Orbit-Electrons . Elementary Particles become from the* ***Permutations of the three Elements in Sub-Space*** *, and Inter-Voltage-Points P , D, with* ***Forces*** *the* ***Wave-Constructive*** *and* ***Destructive-Interference*** *, Placed ⊕ Space and ⊖ Anti-Space , at the* ***Two-Nodes*** *of the* ***Standing-waves-Wavelength*** *. The Link between the Gravitational constant G and above is the [Particle &Wave] Photon which as Particle is f_N , in a Stationary-Wave-Storage , and as Wave an Propagating Electromagnetic-Wave of , λ .*

Keywords : *The Duality Photon , The Origination of Cosmic Particles , The Atoms Bonding.*

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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 called Energy* , and it is the content of all sciences [32]

2… Euclidean-Geometry describes the Space only but Not the Energy , ***motion*** .[48] .

3…The Solution of all the Unsolved-Ancient-Greek-Problems [50] opened the way to **Material-Geometry** [54] which Incorporates the Motion In-Space (⊕↔⊖) , [61] .

The Space exists in Energy-Caves as ***Energy-Quantum-Quantities*** [39] while Motion or **Energy exist** inCaves as an ***Confined-Stationary-wave*** which is either Static or an moving Energy-Storage or an Energy-Box [68] . The Two Opposites (+) , (-) exist in Nature and are found everywhere from → Zero-Point (0) ≡ [+= -] or (+A)+(-A) = 0 in E-Geometry and → [0] = [⊕↔⊖] ≡ f_n , [⊕←ds→⊖]≡ ds in Material- Geometry , to the aperon , ± ∞ , where , **in The Space ≡ 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 ⊕ constituent moves as

for Newton-Gravitational-constant G-force Periodically to ⊖ constituent [82-86] .

5… Gravitational-Force G , Acting in the **Beyond-Planck** - Cave , and on the light Velocity **Vector** $\bar{\mathbf{c}}$, creates Electron-Charge $\bar{\mathbf{q}}_{\text{Electron}} = \frac{G}{c\sqrt{2}}$ and the Material-Points $\bar{\mathbf{q}}_{\text{Photon}} = \frac{G}{\sqrt{2}.f}$ while by effecting on the **Whole-Planck**-Cave $\mathbf{L_P \equiv e^{\,i\,.\,(-\,5\pi/2)\,.10}}$, 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] **.** L-Velocity $\bar{c}$ Acting on a-cave , $\mathbf{r = \frac{h}{c.Z_c}} \neq L_P$ originates Hydrogen-cave.

6…The Rotation of the Two Elements ,[⊕↻↺⊖], Up or Down in the Material-Point-circles Originates the Spins , $\pm\frac{1}{2}$, $\pm$ 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 [⊕↔⊖] of Breakage [$\pm\bar{c}.\ s^2{}_m$] in cave { M-Point = d s_m= $e^{i.\left(\frac{N\pi}{2}\right)b=10^-N=\pm\infty}m$} as → v = w r =2πr. f = σ Φ , in the Great and Small circles of Glue-Bond rotation creates the **Three-States** of **frequencies** $f_{\pm1/2} = \frac{(1+\sqrt{5})\,\sigma}{8\pi r}$, $f_{\pm1} = \frac{(1+\sqrt{5})\,\sigma}{4\pi r}$, $f_{\pm1/2} = \frac{(1+\sqrt{5})\,\sigma}{8\pi r}$, and energy E = h f_m .

Because **Angular-Momentum** $\bar{\mathbf{B}} = \frac{2L}{\bar{w}} = \frac{2L}{2\pi f} = [\frac{2L}{2\pi}].[\frac{1}{f}] = \frac{\text{Constant}}{2\pi}[\frac{1}{f_m}]$ = **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 $\mathbf{f_p}$ which is giving the **Least-Unit-Energy-cave** and that is of **Hydrogen - Cave H** , [81] , as equations , $\mathbf{r = \frac{h}{c.Z_c}}$, g .a^3. $\mathbf{f^2_p}$ = 1 and E = h f_p = 13,6 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 = πg , then Reaction = mass is that of the **Electron Cave e ,** as , $4\pi^2f^2{}_e.m_e$ = **k** = $\boldsymbol{\pi}$ **g** and $\mathbf{m_e = g / [4\pi f^2{}_e]}$, [82]

9...The Rotation around the ⊕ constituent , of the Confined-Electron ⊖ constituent in the Potential-Energy of Hydrogen-cave , which consists a configuration of masses $\mathbf{m_p}$ and of Charges $\mathbf{q_e}$, **Originates ,** the **Uniform-Magnetic-field** $\bar{\mathbf{B}}_{\mathbf{L}}$ **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 $\mathbf{f_N}$ **, so** Produces an **oscillating magnetic-field** $\bar{\mathbf{B}}_{\mathbf{N}}$, which in turn is the source of an oscillating Electric-field $\bar{E}_N$, which implies the Regeneration each other and which is a Propagating Electromagnetic - Wave where $\bar{E}_N = \bar{B}_N$ **c** . and a Phase difference [$\varphi = \frac{\bar{B}}{\Phi}$]}. [86]

10…This Resonance - frequency f_R is Independent of the Electron`s speed and radius so allows **Bonding between Atom-caves** which contain a Formation ,a Heap of Masses and of Charges . In a Proper- Stationary-Magnet on which the Rotation-motion becomes as linear Oscillation 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 , Originates the Nutation-motion in Precession as **Cyclotron-Resonance - frequency** $\mathbf{f_R} = \sqrt[4]{\frac{1}{4\pi^2 m_e.r^3}}$ of cave ,r, and the produced-Energy ≡ motion is stored in the Orbit as a New **Uniform-Magnetic-field** $\bar{\mathbf{B}}_{\mathbf{F}} = |\frac{2\pi.M_T}{Q_T}|\mathbf{f_R}$ 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 [⊕ = Proton , ⊖ = 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 → 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 $\bar{\mathbf{c}}$, with Derivatives the Photon-Charge $\bar{\mathbf{q}}_{\text{Photon}}$ in Material Point cave **r** , Gravity Constant **g** , and Planck constant $\mathbf{L_P}$, 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 → [± s^2] = [MFMF] ≡ ***The Chaos*** , as base for all motions , and Gravity as force [∇i] , while the clashed with the

constant velocity , $\bar{c}$, consist the Dark matter [$\pm\ \bar{c}.s^2$] and the Dark energy [$\bar{c}.\nabla i$] **, *Declaring that*** → Antimatter-Galaxies and Antimatter-Asteroids can exist only as Dark-matter or and Dark-Energy and **NOT** as Antimatter light , **(- c)** ,alone ,
or from → velocity - Breakages , [$\pm\ s^2 = \pm\ (wr)^2$] and [$\nabla i = 2(wr)^2$] , where then become 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** ≡ $\boxed{[\oplus\leftarrow \mathbf{r} \rightarrow\ominus]}$ + **Motion M** ≡ $\boxed{\bar{\mathbf{v}}\ -\ \mathbf{Vector}}$ as [87].
From vibration in Material-Points become , [55]

A → Particles , with Inherent Vibration occupying distance r = ds = $|AA_E|$,
B → Gravity-Field-Energy without Vibration , the only Stationary-Rotating Photon-Spinning-Material-points .
C → Dark-matter-Energy constituents as below ,

A.. [$\pm\bar{v}.s^2$] → Fermions , *Quarks and Leptons* , and → [$\pm\bar{v}.\nabla i$] → Bosons ,
B.. [$\pm\ s^2$] → [MFMF] *Neutral* Field ≡ ***The Equilibrium Energy - Chaos*** , with the *Negative-Energy* binder Field [∇i] → The Gravity force G_f
C.. [$\pm\bar{c}.s^2$] → Dark-matter , and the binder Gravity-force [∇i] , [$\bar{c}.\nabla i$] → 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* → *Energy as velocity* ,$\bar{v}$, and , $\bar{c}$, *exists in the* , **Quantized** , *Discrete monads* , $\pm\ \bar{v}.s^2$ and $\pm\ \bar{c}.s^2$.
B , case is the Transportation of Energy , *from Chaos to Stationary Material points .*
Dark Energy DE ≡ **[$\bar{c}.\nabla i$] (©)** → Acting , *is Positive-Energy* , on the Five Constituents →
{ [(∇i),($+s^2$),($-s^2$),($+cs^2$),($-cs^2$)] } Produces
[$\pm\ s^2$] → MFMF Field [$\pm\ \bar{c}.s^2$] → DM-DE Field of , Dark matter and Anti-matter
[$\pm\bar{v}.s^2$] → Fermions [∇i] → G_f ≡ Gravity-Force in DM-DE Stationary Field .
[$\bar{v}.\nabla i$] → Bosons , [$\bar{c}.\nabla i$] ≡ DE → Dark Energy **c x** (©) [∇i]
→ Gravity Force DE ≡ [$\bar{c}.\nabla i$] = $\bar{c}$ [∇i] = The Travelling-Energy-cave , c , with the velocity-vector. , $\bar{\mathbf{c}}$,
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 ,$\bar{\mathbf{v}}$, and since Energy is vectors then

$\mathbf{k} = \bar{\mathbf{v}}\mathbf{x}\bar{\mathbf{v}}.\ \bar{\mathbf{r}} = \mathbf{v}^2.\mathbf{r}.\ \bar{\mathbf{n}}. = v^2.\ r = (wr)^2.r = [\frac{2\pi r}{T}]^2.r = \frac{4\pi^2\ r^2}{T^2}.\ r = \frac{4\pi^2\ r^3}{T^2} = 4\pi^2\ \frac{r^3}{T^2} = 4\pi^2.r^3.\mathbf{f}^2_{\mathbf{p}}$ 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 $4\pi^2r^2\mathbf{f}^2_{\mathbf{p}} \equiv [2\pi f.r]^2 \equiv [wr]^2 \equiv \mathbf{v}^2$.

For Photon during Motion in [MFMF] ≡ 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 = nλ , 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 → $\mathbf{W_1 = v^2}\ [\ \frac{\mathbf{h}}{\mathbf{2\pi}}\ ] = \mathbf{4\pi^2.r^3.f^2_p = k}$,where as **Wave** is Frequency [$\mathbf{f_1} = (\ E^2 + H^2\ ) = n\ \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{2n\ \bar{B}}{\pi^2 r^4}$] and **Particle** as velocity [$\bar{\mathbf{v}} = \bar{\mathbf{c}} = \lambda\ \frac{f}{\Phi}$] and dependent on velocity ,**v** , and Planck`s constant **h** , or ***on loop*** ,**r** , ***and as frequency*** $\mathbf{f_p}$, which is the Wave . It is proved that this minimum wave - constant → k = π g .

For The **Duality-Photon** → **{ $\bar{\mathbf{c}}$.** $\boxed{\bar{f}_n}$ **+ $\bar{\mathbf{c}}$. $\mathbf{f_n}$ }** ← is proved that ,

1.. Energy-Storage S ≡ $\boxed{[\oplus\leftarrow \mathbf{r} \rightarrow\ominus]}$ ≡ **Particle [** $\bar{\mathbf{v}}$ **.** $\boxed{\bar{f}_n}$ **]** → [$\bar{\mathbf{v}} = \bar{\mathbf{c}} = \lambda\frac{f_1}{\Phi}$] →
And is an Stationary Standing - Wave → { S≡ EM-R ≡ [$f_{1=N}$, f_2 , f_3, f_D ,,$f_n = w^2$]}.
2.. Energy-Motion M ≡ $\boxed{\bar{\mathbf{v}}\ -\ \mathbf{Vector}}$ ≡ **Wave** [$\bar{\mathbf{v}}$. $\mathbf{f_n}$] ≡ [$\mathbf{f_1}$**=** $(E^2+H^2) = n\ \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\bar{B}}{\pi^2\ r^4}$] **and it is a Propagating Wave** {W≡ EM-R ≡ $[\varepsilon E^2 + \mu B^2] = 2.\lambda c.\sin.2\varphi[\varphi = \frac{\bar{B}}{\Phi}]$}.
3.. Gravitational - constant $G \equiv \Phi^2.\ [\{\sigma\ \Phi\} \equiv 2\pi f_p\ r \equiv w\ r \equiv \bar{v} \equiv m\ g = \bar{c} = \frac{2.B}{\pi r^3}$]

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 $r = |(\bar{c}.T)| = \sqrt{v^2 + c^2}$ and by using Geometry-Space Vector $\bar{r} = |(\bar{c}.T)| = \sqrt{v^2 + c^2}$ then The total Rotating energy $\bar{\Lambda}$ is →

$\pm \bar{\Lambda} = \bar{p}.r = (M.c).r = (M.c).\sqrt{v^2 + c^2}$ and squaring both sites $[\pm \bar{\Lambda}]^2 = p^2.r^2 = M^2.c^2.(v^2+c^2)$

$= (M^2.v^2).c^2 + M^2.c^4 = (p^2.c^2) + M^2.c^4 = [p\,c]^2 + [m_o.c^2]^2$ or is $\mathbf{E_T = E_R + E_K}$ i.e.

The Total - Energy of Elementary-particle ≡ Intrinsic Rotational + Kinetic Energy ,

1b... The Beyond Planck-Scale r < L_p = 1,616199.10^{-35} m :

Preliminaries :

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

[A] ds = (AB/ n = ∞) = 0 **[B]** **[A]** ds = → = AB / n= 1 **[B]**

…….……..…….. →→→→→→→→→→→

Continuous as Points **(.)** ***Discrete as monads*** **(r ≡ ds = 1 → n)**

Work done (W) by Impulse (P) on a Virtual displacement (ds > 0) is zero , or

$W = \int A\text{-}B = [P.ds] = 0$ → **[ds . (P_A + P_B) = 0] → P_A ≡ Points i*n* Space [S]**

and P_B ≡ Anti-Space [AS] *or* **[ds . (PA + 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*** **→ ds = 0 and P = ∞) . [70]**

It was shown that **in PNS , v = ∞ , T= 0 , meaning that velocity is infinite and Time is not existing and thus any length |AB| in [PNS] is constant ,** because AB = ds = Constant = v . 0 = ∞. 0 **. Straight line AB is discontinuous (** ***discrete*****) with dimensional Units ds = AB / n** where **n = 1 → ∞ , and continuous with points [ds = 0] , (** ***This is the Dual Nature of lines in , geometry , as discrete and continuous*** **) .** From definition work **W** = Force **x** D = Displacement ≡ Momentum [mv] **x** Distance [r] ≡ **mv. r** or **W ≡ mv. r** , exists Work where

1…→ r Becomes from Material-Geometry where the Quantization of Space for **the Rotated Energy case** (**s** = 0 and cos φ = 0), **In-Primary-Quaternion** $[s + \bar{v}\,\nabla i]^{1/w} = e^{-i.(\pi/2+2k\pi).w}$

{for angle **φ = π/2** ,dimension power **w=b=10** and **k = 0**} exists the **minimum-Energy-Cave** r.

For base e = 2,71828 and base b = 10 then e^ - (16,1181) = 1 . 10^{-7} or **$r = 1{,}07.10^{-7}$** m

$r_{min} = 1{,}07.10^{-7}$ m → i.e. **r_{min}≡** The minimum Energy-Space-Cave ≡ **Space-Quantum** .

Placing the→ **r_{min}** in the Dynamic-**Space-Energy** relation , g .r^3.$\mathbf{f^2_p}$= 1 , *when g=1* , then ,

$\mathbf{f^2_p} = \frac{1}{r^3}$ = 8,0647139.10^{20} m , **f_{min}=2,839844.10^{10} H ,** The ***Electron-Nutation-frequency***.

2…→ f = f_{min}=2,839844.10^{10} H ≡ The minimum Energy in Cave ≡**The-Energy-Quantum**

From wavelength-relation n λ = 2r = n v/f , exists v = λ f or → $\bar{v} = \bar{c} = \lambda f$. and since v = w r = [2π/T].r = 2π.f_1.r , wavelength λ = c T = c /f_1 , and from cave r = n.[λ/2] = n.(c/2f_1) then **v** = 2**π**.f_1[**n c**/2f_1] = **n.π.c ,** or **v = n.π.c** . i.e.→ **The Quantum of velocity is constant c**.

From Constant-Energy Orbit-relation $\mathbf{k} = [\bar{v} x \bar{v}].\bar{r} = v^2\, r = (w\, r)^2.r = [\frac{2\pi}{T} r]^2.r = \frac{4\pi^2 r^2}{T^2} r = \frac{4\pi^2 r^3}{T^2} =$

$4\pi^2 r^3 \mathbf{f^2_{min}} = [2\pi f.r]^2.r = [\,\mathbf{n.\pi.c}\,]^2.\mathbf{r} \equiv$ **Kepler Universal Laws for** ***macrocosm and microcosm*** .

Frequency → $\mathbf{f_{min}}$, becomes from velocity relation v = w r = 2πf. r , as $\mathbf{f_{min}} = \frac{v}{2\pi r_{min}}$ or

$$\mathbf{f_{min}} = \frac{v}{2\pi r_{min}} = \frac{n\pi.c}{2\pi r_{min}} = \frac{n.c}{2.r_{min}} = \frac{2{,}99810^{\,8}}{21{,}07.10^{-7}} = 1{,}4009345.10^{14}\ \text{H}$$

From momentum relation B = m r v = m r^2 w = m r^2 (2πf) = $\frac{J.w}{2}$ = $[\frac{\pi r^4}{4}]$.[2πf] , then the Mass of the elementary particles is $\mathbf{m} = \frac{\pi.r^2}{4} = \frac{\pi.(1{,}07.10^{-7})^2}{4}$ = 8,992023.10^{-15} Kg or ,

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

Planck mass **m** = $\frac{\pi^2 r^4 f}{2rv} = \frac{\pi^2 r^3 f}{2c} = \frac{\pi^2 (1{,}07.10^{-7})^3.1{,}4009345.10^{14}}{2.2{,}99810^8}$ = 2,8248572.10^{-15} Kg =m_{min}/π Quantization **,** ***for*** **k = 1** , is the Planck-minimum-Energy-Scale Decimal-Cave $\mathbf{L_{min} = L_p}$ $\mathbf{L_p} = e^{i.(\frac{\pi}{2}+2k\pi).b} = e^{i.(-5\frac{\pi}{2}).10} = e^{-.(78{,}5398)} =$ **8, 906**.10^{-35} m = { $\sqrt{3}$.π. **1,616199**.10^{-35} m }

From [70] the velocity of Elementary particles is the light velocity-vector . $\bar{c} = \bar{v} = 2\pi r.\, f_e$ and the frequency $f_e = \frac{\bar{c}}{2\pi.r}$ ....(1) . The Balancing of , Space and Anti-Space in a Rotating Sub-Space Common circle happens from the [±] 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 $\bar{B} = \frac{J.w}{2} = \frac{\pi r^4}{4}[2\pi f] = \frac{\pi^2 r^4}{2}[f]$…(2) Frequency $\mathbf{f = 2B\frac{1}{\pi^2.r^4} = \frac{2B}{\pi^2.r^4} = \frac{[1+\sqrt{5}].\sigma}{4\pi r} = \frac{\bar{c}}{2\pi.r} = \frac{\Phi.\sigma}{2\pi r}}$, or $\mathbf{2\bar{c} = [1+\sqrt{5}]\sigma}$…(3) .A-momentum $\bar{B} = \frac{[1+\sqrt{5}].\sigma.\pi.r^3}{4} = \frac{\pi r^3 \Phi.\sigma}{2}$ ...(4) , where **Unit-energy-constant** is $\frac{T^2}{a^3} = k = [\frac{4\pi^2}{G.m}]$, or $ka^3f^2 = 1$

The Rotational energy is $\rightarrow E_R = \bar{B}\,.\,\bar{w} = 2L = J.w^2 = J\frac{c^2}{r^2} = [\frac{\pi r^4}{2}]\frac{c^2}{r^2} = \frac{\pi c^2}{2} r^2$ .....…(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 .**Total-Energy** $\rightarrow \mathbf{E_T} = E_R + E_K = \frac{\pi c^2}{2} r^2 + \frac{1}{2} m.v^2 = \mathbf{1{,}4118323.10^{16}.r^2 + \frac{1}{2} m.v^2}$ ….(5a)

Since Total-Energy L = B w = $\frac{J.w}{2}$ w = $\frac{J.w^2}{2}$ then 2L = J.w² , and $\bar{B}$ = r.mv = $r\frac{\pi.r^2}{2}2\pi f.r = \frac{\pi^2 r^4}{1}\mathbf{f}$

From momentum relation $\bar{B}$ = m r v = m r² w = m r² (2πf) = $\frac{J.w}{2} = [\frac{\pi r^4}{4}].[2\pi f]$, then the Mass of the elementary particles is $\mathbf{m} = \frac{\pi.r^2}{2}$, i.e. is dependent on the radius of cave ,and for Gravity cave $\mathbf{r} = 10^{-62}$ m , then **Material-Points mass** $\rightarrow \mathbf{m} = \frac{\pi.10^{-124}}{2} = 1{,}570796.10^{-124}$ kg.

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

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 . Issues also $B^2 = 2LJ = 2L\frac{\pi r^4}{2} = \pi L.r^4$ and $\pi L = B^2.r^4$.

2b.. In Planck`s Scale , length $\mathbf{r = L_p} = 1{,}616199.10^{-35}$ m velocity $\mathbf{v = c}$:

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

From velocity relation $\mathbf{c} = w\,r = 2\pi r\,f$, frequency $\mathbf{f = \frac{c}{2\pi r}} = \frac{2{,}998\,10^8}{2\pi.1{,}616199.10^{-35}} = 2{,}95236210^{42}$H and Period $\mathbf{T} = \frac{2\pi r}{c} = 3{,}3871185.10^{-43}$ s . **From Angular momentum** $\bar{\mathbf{B}} = r\,m\,v = \frac{\pi^2 r^4}{1} f$ then mass $\mathbf{m} = \frac{\pi^2 r^4 f}{rv} = \frac{\pi^2 r^4 f}{2\pi r^2 f} = \frac{\pi.r^2}{2} = \frac{\pi.(1{,}616199.10^{-35})^2}{2} = 4{,}1030756.10^{-70}$ Kg ,

Stress **σ** from above equation $\mathbf{f_p} = \frac{n\sigma.\Phi}{2\pi r}$ is $\boldsymbol{\sigma} = \frac{2\pi rf}{(n)\Phi} = \frac{2\pi rf}{1.\Phi} = \frac{2\pi.1{,}616199.10^{-35}.2{,}95236210^{42}}{1{,}6180339} =$

$= 1{,}846462.10^8$ t/m2 = $1{,}846462.10^{11}$ Kg/m2 , and Angular velocity $|w| = \frac{\sigma}{2r}[1+\sqrt{5}\,] = (\frac{1{,}846462.10^{11}}{2.1{,}616199.10^{-35}}).\,1{,}6180339 = 1.5007013.10^{46}$, or $|\mathbf{w}| = 1{,}5.10^{46}$ rad/sec , and the constant figure of Energy is that of Stress $\boldsymbol{\sigma} = 1{,}846462.10^{11}$ Kg/m2 = $1{,}846462.10^{11}$ Joule .

Velocities in caves become from equation $\mathbf{v^2} = \frac{2}{m}[E - \{\frac{k}{r} + \frac{L^2}{2mr^2}\}] = [4\pi^2.\mathbf{k}]\,.\,[\frac{1+e}{r}]$ 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 $E_T = E_K + E_R$, then the Total energy in cave is $E = \frac{mv^2}{2} + \{\frac{k}{r} + \frac{L^2}{2mr^2}\}$ where **L = S** = the Spin of Particles .

From **Mechanics** In the One degree of freedom Vibration of a mass , **m** , and Stiffness , **k** , in a distance , **a** , is for , $w^2 = [\,k/m\,]$ from equation , $m\,\ddot{x} + w^2 x = 0$, with solution → the Period $\mathbf{T} = 2\pi\,.\sqrt{\frac{m}{k}}^2$, frequency $\mathbf{f_H} = \frac{1}{2\pi}\sqrt{\frac{k}{m}}^2$, and Energy $E = h\,f_H$, where , **h** = Planck`s constant ,and from Orbit-equation $\bar{\mathbf{v}} = \sqrt{\frac{2}{m}[E - \{\frac{k}{r} + \frac{S^2}{2mr^2}\}]}$ and for v = c then , $\mathbf{E} = \frac{mc^2}{2} + \frac{k}{r} + \frac{L^2}{2m\,r^2} = h\,f_R$

From Hydrogen Orbit-motion , $r = \sqrt[3]{\frac{1}{k.f^2}}$, or $\mathbf{k}.f^2.r^3 = 1$ and Constant-Unit-Energy $\mathbf{k} = \frac{1}{f^2.\,r^3}$ which **Energy k** , is the , **Quantum of Energy** , in the first Planck-length-cave .

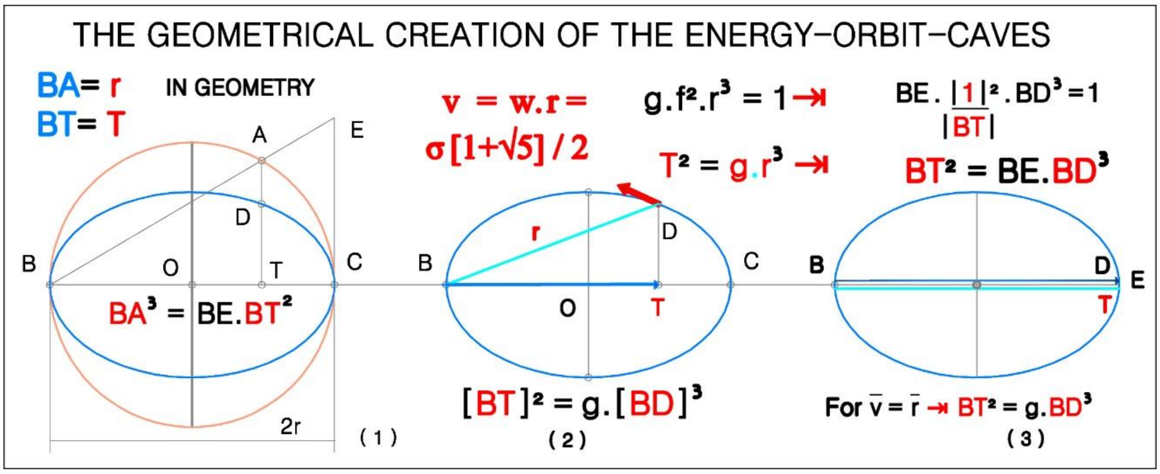
For **Black-Holes** , the Total-Energy $L = \bar{B}\,\bar{w} = \frac{J.w}{2}\,w = \frac{\pi r^4}{2}[2\pi f]^2 = \mathbf{2\pi^3 r^4 f^2} = r\,mv = r\,m\,.wr$ and mass $\mathbf{m} = \frac{2\pi^3 r^4, f^2}{r^2 2\pi f} = \frac{\pi^2 r^2}{1}\mathbf{f} = [\frac{\pi r.v}{2}]\mathbf{v}$,while **Angular-Momentum B** $= r.mv = r\,[\frac{\pi rv}{2}]\,v = \frac{\pi\,r^2}{2}\,\mathbf{v^2}$

$= \frac{\pi\,r^2}{2}\mathbf{v^2} = \frac{\pi r^3}{2}\,\mathbf{[n.\pi.c]^2} = \frac{\pi^3 r^3}{2}\,\mathbf{c^2}$, or Black-Hole-Energy → $\mathbf{B_E = 2.\pi^5\,.r^3.f^2 = (\pi r)^3.w^2}$ ←

i.e. **Velocity in Black-Holes is Related to Cave , r ³, and Energy w² times of light velocity**.

C... THE ENERGY CAVES , AND E - GEOMETRY :

Figure – 1 - : The Periodic motion in Caves follows **Material-Geometry rules** .



In (**1**). Is shown the Geometrical Expose of , Dynamic-Space-Energy relation $g.r^3.\mathbf{f}^2_{\mathbf{p}} = 1$

In (**2**). Is shown the Mechanical Impress of the , Orbit-Space-Energy relation $g.r^3.\mathbf{f}^2_{\mathbf{p}} = 1$

In (**3**). Is shown the Extreme Design of the , Dynamic-Space-Energy relation $g.r^3.\mathbf{f}^2_{\mathbf{p}} = 1$

To Proof :

The Right-angled-Triangle ABC at $A = 90^0$, lies on [O,OC=OA] circle and CE is the tangent at C . Since angle $BAC = 90^0$ of triangle CAE , then angle $< CAE = 90^0$.

Since $BA \perp AC$ and $AT \perp BC$ then , the **Power of Point B on ACT triangle** is $BA^2 = BT.BC$

Since $BC \perp EC$ then , the **Power of Point B on ACE triangle** is $BC^2 = BA.BE$ …..(2)

Squaring the first relation and substituting (2) then $[BA^2]^2 = BT^2.(BC^2 = BA.BE)$ and

$BA^4 = BT^2.BA.BE$, or → $\mathbf{BA^3 = BT^2.BE}$ or → $|\frac{\mathbf{1}}{\mathbf{BE}}|.\mathbf{BA^3}.|\frac{\mathbf{1}}{\mathbf{BT}}|^2 = \mathbf{1}$ o.ε.δ ≡ q.e.d ...(3)

Remarks :

1.. Physics follow the Geometry-Rules in all levels , either in microcosm or in macrocosm.

2.. Constants in Physics , are defined as Geometry-Linear-monads , or the opposite .

3.. The Physical dimensions are defined in two Perpendicular-Lines as the Surfaces are .

4.. Linear -Vibrations [$\ddot{x} + w^2 x = 0$] of **Two-masses** In Orbit-Caves , **Occur on the Line Vectors** or on Straight-lines in the **x , y** Plane as Centripetal forces .

5.. **Linear-Vibrations** [$\ddot{x} + w^2 x = 0$] of **Three-masses , Occur on Two-Line-Vectors Perpendicular each other** , vibrating on Straight-line , $\ddot{y} + w^2 y = 0$, of $\mathbf{x \perp y}$ Plane and follow the Lissajous Shapes , [83] , where for ,

a.. Difference of Phase $d_\varphi = 90^0$ emission is → The Eight-Shapes □ .

b.. Difference of Phase $d_\varphi = 0^0$ emission is → The Ellipse-Shapes ∝ .

c.. Difference of Phase $d_\varphi = 45^0$ emission is → The Double-Saddle-Shapes . Ȣ , ꞬƆ .

6.. For Planck length [73] P-49, was shown that **the Rotated Energy case** , when **s** = 0 and $\cos\varphi = 0$, exists for angle $\varphi = \pi/2$ and Quaternion $(s + \bar{v}\,\nabla i)^{\mathbf{1/w}} = \mathbf{e}^{-\mathbf{i}.(\boldsymbol{\pi}/2+2\mathbf{k}\boldsymbol{\pi}).\mathbf{w}}$...(1) the dimension power → **w = b** ← ***and for*** **k = 1** then (1) becomes , [84]-P.74

$\mathbf{e}^{-\mathbf{i}.(\pi/2+2k\pi).w} = \mathbf{e}^{-\mathbf{i}.(\pi/2+2k\pi).b} = \mathbf{e}^{-\mathbf{i}.(5\pi/2).b} = \mathbf{e}^{-\mathbf{i}.(5\pi/2).10}$ [86] …... (2)

Equation (2) fits , *as minimum cave* , in the Planck length and is $\mathbf{L_p = e^{-i.(5\pi/2).10}}$ .....(3)

Equation (3) is the smallest ***Energy-Unit of Space*** , and this because of s = 0 and 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 → $\mathbf{z}^{1/w} = \mathbf{(}\, s + \bar{\mathbf{v}}\ \nabla i\ \mathbf{)}^{1/w} = |zo|^{-w}.[\cos.(\varphi + k\pi)/w + i.\sin.(\varphi + k\pi)/w]$

$= |zo|^{-w}.e^{-i.(\varphi+k\pi).w}$ for $\cos.(\varphi+k\pi)/w = 0$ then exists only the **Imaginary part** of monad

(**v**∴ ∇i) **≠ 0** , where $\varphi = \pi/2$ and then , $\mathbf{z}^{1/w} = |zo|^{-w}.e^{i.(\varphi+k\pi)/w} = e^{-i.\left(\frac{\pi}{2}+k\pi\right).10}$ which is the ***Diffraction Energy mechanism*** for all Space Levels of quantization which are the **Energy Particles only** i.e. The Energy particles **in Stationary caves** are $\mathbf{z}^{1/w} = |zo|^{-w}$. Lv = E-Monad.

Extending quantization of Energy according to exponential formula→ $\mathbf{L_v = e^{-i.(5\pi/2).10}}$ then $\mathbf{L_v}$ on the decimal base b = 10 and for k = ± 0 → ± ∞ , are the **Energy caves** as ,

For base e = 2,71828 and base b = 10 then e^ - (13,8155) = $\mathbf{1.10^{-6}}$ **m**

For base **e = 2,71828** and k = 0 **Lv = e^i.(± π/2)b** then **e^ (-15,7079)** = **1,78118 .10 $^{-7}$ m**
For base e = 2,71828 and base b = 10 then e^ - (16,1181) = 1 .10 $^{-7}$ or **r = 1,07.10^{-7}** m.
Placing **r** , in the Dynamic-Space-Energy relation when g =1 then r ^{3}.**f^2_p**= 1 and **f^2_p** = $\frac{1}{r^3}$ = 8,0647139.10^{20} m and occurs the , **minimum frequency f$_m$ = 2,839844. 10^{10} H** …(4)
For Electron radius r $_e$ = 5,82.10^{-16} m , Weight of Electron Q = m $_e$ g = 9,11.10^{-31}.9,808 = 8,93.10^{-30} Kg , the Moment of Inertia-Disk J $_e$ = J$_3$= [π a^4/2] = π/2[5,8. 10^{-16}] ^{4} = 1,777591.10^{-61} m^4, Angular velocity w$_e$ = $\frac{v}{r_N}$ = $\frac{c}{1836}$ = $\frac{3.10^8}{1836}$ = 1,633.10^5 m/s because of masses analogy and **Electron-Nutation-frequency f $_N$** = $\frac{s\,Q}{2\pi.J_3 w}$ = $\frac{5,82.10^{-16}.\ 8,93.10^{-30}}{2\pi 1,777591.10^{-61}.1,633.10^5}$ =

f $_N$ = f$_R$ = 2,8398447.10^{10} s^{-1} ……..(23)

The Quantum-Energy E = h **f$_N$** = 6,62606957.10^{-34} . 2,839844. 10^{10} H/ 1,6022. 10^{-19} eV= = 1,17444789844.10^{-4} eV , is a small Quantity of Quantum-Energy .
Since this minimum frequency **f $_N$ = f$_R$ = 2,8398447.10^{10}** 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}** m } - **ENERGY** – { **f$_m$ = 2,839844. 10^{10} H }** IN **QUANTIZED-CAVE** { **g .r** ^{3}. **f^2_R = 1**} OF **SPACES** {[s + $\bar{v}\nabla$i]$^{1/w}$ = **e**$^{-i\left(\frac{\pi}{2}+2k\pi\right).w}$ = = **e**$^{-i.\left(\frac{5\pi}{2}\right).10}$ } , CONSISTS The min. **QUANTUM-ENERGY → E = 1,1745 eV.**

7... For Energy-Cave equation → **e**$^{-i.(5\pi/2).10}$ **Formatters min-cave → r = 1,07.10^{-7}** m which in turn by the **Unit-Energy** Orbit-Surface-U-Planck-relation , g = 1≈ g , and from ,

8… Unit-Energy-Mould **g.r^3. f^2_R= 1** or **f^2_R** = $\frac{1}{r^3}$ **creates** the minimum frequencies , ***Energy*** , **f$_R$= 2,8398447.10^{10}**H , between , **1,330265.10^{10}** H and **4,1701097.10^{10}** 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** [$\frac{s.m_e.}{2\pi.J_3 w}$]which passes through atoms structure and **as Energy-Spring in Magnetic-field ,** Strengthen 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 → ⟨**r $_{min}$** | ↻↺ |**f$_m$**⟩↔[**f$_N$**] ← 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 .mv =k**= Constant-Area
2. The **Unit-Cave-Energy Quantization** as Work and is → W = 4π².r³.**f^2_p** = 1
3. The **Resonance** Unit-Cave-Frequency **f** = $\sqrt[4]{\frac{1}{4\pi^2 m.r^3}}$ of Masses $\frac{1}{M_T}$ = $\frac{1}{m_P}$ + $\frac{1}{m_n}$ + $\frac{1}{m_e}$
4. Charges $\frac{1}{Q_T}$ = $\frac{1}{q_P}$ + $\frac{1}{q_e}$ 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 = $\frac{\pi}{g\,r^2}$ [g² r +2. S².f²] in cave a =$\sqrt[3]{1/g\,f^2}$

c... Equations (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** = $\sqrt[3]{\frac{1}{g.f^2}}$ = 2,1127839.10^{-11} m, issues E=hf$_1$ =13,6 eV/h and for e = 0 then **v^2** = [4π².**k**] . $\frac{1}{r}$, and constant **k** = $\frac{r.v^2}{4\pi^2}$ = $\frac{a.v^2}{4\pi^2}$. The Constant **k** of Electron-Nutation is measured as → k = $\frac{2,1145016.10^{-11}(2,998.10^8)^2}{4\pi^2}$ = 4,81406.10^4 m^3/ s^2

c.. For any Material-Point occupying only **Spin ≡ L** , then $\frac{k}{r}$ [1+2π²mk(1+e)] = 0 or 1+2π²mk(1+e) = 0 and for ***Electron*** k = - $\frac{1}{2\pi^2.m(1+e)}$ = - $\frac{1}{(1+e)}$ [6,9999. 10^{29}] N and ***Rotating-Energy*** due to ***Electron-Spin*** is E = $\frac{S^2}{2m\,r^3}$ = $\frac{(5,691952.10^{-34})^2\ Kg.s/m}{2.7,2373149.10^{-32}(2,3762992.10^{-16})^3}$ = 166,8059.10^9 J , which is an energy released by explosion of one Kiloton of TNT .
Rotating-Energy due to a ***Black Hole-Spin*** is E = $\frac{S^2}{2m\,r^3}$ = $\frac{(1,152.10^{66})^2}{2.1,6.10^{42}(2,4.10^{15})^2}$ = 2,604.10^{43} J equal to the ***Energy of an Electromagnetic gamma-ray-burst*** → i.e. energy-constant **k** , is

the Regulator of Energy as equation , $\mathbf{k} = \frac{r.v^2}{4\pi^2} = \frac{(2{,}4.10^{15}).9.10^{16}}{4,\pi^2} = 5{,}47.10^{30}$ N →

1c... The Golden Ratio Pattern Φ Properties .

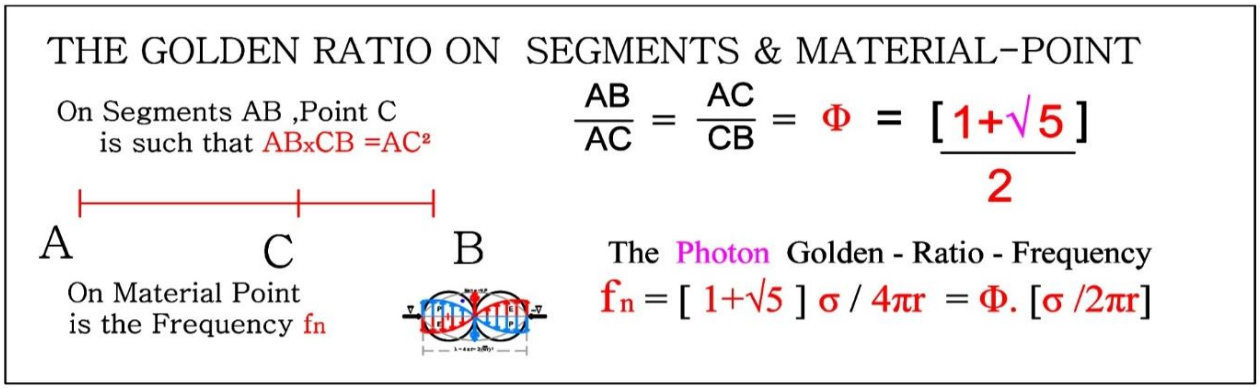


Figure – 2 - : The Physical explanation of **The Golden-Ratio Φ** in Universe :

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

Proof :

According to the definition of Mean ratio exists AB / AC = AC / CB , or AC² =AB.CB = AB.[AB-AC] = AC² = - AC.(AB) + AB² → AC² +AC (AB) - AB² = 0 ……(2) Solving the second degree equation (2)

then **AC =** $\frac{\mathbf{AB}}{\mathbf{2}}$ **[**$\sqrt{\mathbf{5}}$**+1]** , i.e. Point C on AB sector , is such that issues (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 σ1,σ2 , and Shear stresses $\boldsymbol{\tau_{12}}$ are as equation $\sigma = \sqrt{(\boldsymbol{\sigma 1} - \boldsymbol{\sigma 2})^2 + \mathbf{4}\,\boldsymbol{\tau_{12}}}$, and

$\sigma 1,2 = (\sigma 1+\sigma 2)/2 \pm (½)\sqrt{(\sigma 1 - \sigma 2)^2 + 4\,\tau_{yz}{}^2}$, where → $\tan\theta = 2.\,\tau_{12} / (\sigma 1-\sigma 2)$ .. (3)

When the surface becomes a Point [**This is the Extreme case *where* surface *is interchanged as* line or 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–handled coordinate system , where exists $\sigma 2 = 0$ and $\tau_{12} = \sigma 1$, then equation (3) becomes ,

→ $\boldsymbol{\sigma}1,2 = \sigma 1 /2 \pm (½).\sqrt{\sigma 1^2 + 4.\sigma 1^2} = \frac{\sigma 1}{2}.[1\pm(\sqrt{5})] = \frac{\sigma}{2}.[1\pm(\sqrt{5})]$ …..... (4)

Equation (4) denotes the way that Stresses σ**1,2** are shaped on any Volume according to the Principal Stress **σ** , and which ***is the Golden-ratio*** $\Phi = \frac{\sigma}{2}$ **[1 ± (**$\sqrt{\mathbf{5}}$**)]** ***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 → 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 $\Phi = 1+\frac{\mathbf{1}}{\mathbf{\Phi}} = 1{,}6180339887$: Proof ,

It is holding → $1+\frac{\mathbf{1}}{\mathbf{\Phi}} = 1 + \frac{\mathbf{1}}{[\mathbf{1}+\sqrt{\mathbf{5}}]\,/\,\mathbf{2}} = 1 + \frac{\mathbf{2}}{[\mathbf{1}+\sqrt{\mathbf{5}}]} = \frac{\mathbf{2}[\sqrt{\mathbf{5}}-\mathbf{1}]}{[\sqrt{\mathbf{5}}+\mathbf{1}].[\sqrt{\mathbf{5}}-\mathbf{1})]}$ or ,

$1+\frac{\mathbf{1}}{\mathbf{\Phi}} = 1 + \frac{\mathbf{2}[\sqrt{\mathbf{5}}-\mathbf{1}]}{\mathbf{4}} = 1+\frac{[\sqrt{\mathbf{5}}-\mathbf{1}]}{\mathbf{2}} = \frac{\mathbf{2}+\sqrt{\mathbf{5}}-\mathbf{1}}{\mathbf{2}} = \frac{[\sqrt{\mathbf{5}}+\mathbf{1}]}{\mathbf{2}} = \Phi$, ***therefore*** , $\Phi = 1+\frac{\mathbf{1}}{\mathbf{\Phi}}$ ….(5)

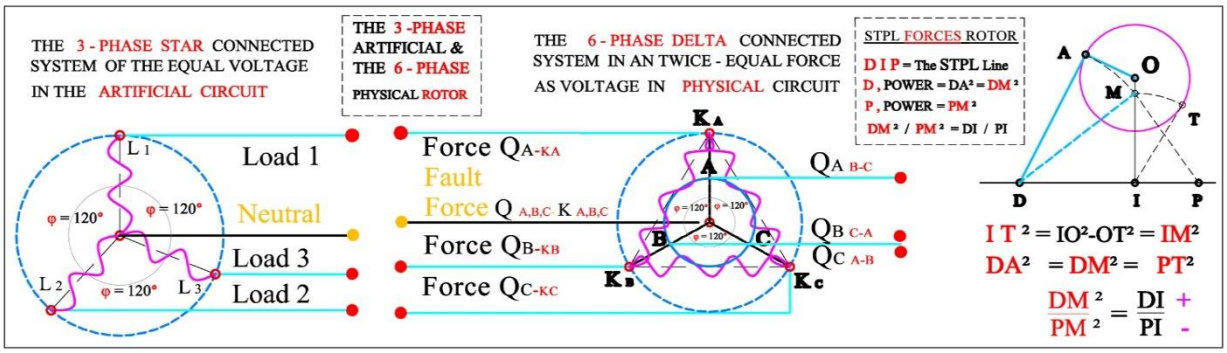
Equation (5) is a very Interesting Property of the Golden - Ratio because is that , ***it can be Defined in terms of itself*** , i.e. of unit 1 equal to a new Φ which defines ***the Space*** , and of $\frac{\mathbf{1}}{\mathbf{\Phi}}$ defining the Opposite which is ***the Anti-Space*** ,

and as continuous fraction is , $\Phi = 1+[\ \frac{1}{1+\frac{1}{1+\frac{1}{1+\frac{1}{\cdot}}}}\ ]$ …. (6)

Because number Φ , multiplied with its Reciprocal number $\frac{1}{\Phi}$, *is process of Addition,* and equal to unit 1 , so → **Space * Anti-Space ≡ Monad** ← or $\Phi * \frac{1}{\Phi} \equiv 1$ because , $\rightarrow \Phi * \frac{1}{\Phi} = [1+\frac{1}{\Phi}]\frac{1}{\Phi} = 1$ or $\rightarrow \frac{1}{\Phi} + \frac{1}{\Phi^2} = 1$ and $\Phi + 1 = \Phi^2$ or $\mathbf{\Phi^2 = \Phi + 1}$ …(7)
Equation (7) is written $\Phi^2 - \Phi - 1 = 0$ and the roots of the second degree equation is $x = +\frac{\Phi}{2} \pm \frac{[\sqrt{(\Phi^2+4\Phi^2)}]}{2} = \frac{[\sqrt{5}+1]}{2}.\Phi = \Phi*\Phi$ i.e. Golden-Ratio Property is continuously increasing by its self , ***a Self-Growing Property of frequency*** $\mathbf{f_n}$ ***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 Equilibrium of → **The Two-Opposite-Rotational-Energies** [±] ← 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 Angular-momentum B ≡ ± Spin S as , $\bar{B} = \frac{J.w}{2} = \frac{\pi r^4}{4}[2\pi f] = \frac{\pi^2 r^4}{2}[\ f\ ] \equiv [\mathbf{Constant*f}] \equiv \frac{2L}{\bar{w}} = \frac{2L}{2\pi f} = [\frac{L}{\pi}].[\frac{1}{f}] = \frac{4r.L}{(1+\sqrt{5})\sigma}$, ***or***
$\mathbf{\bar{B}} = \frac{4r.L}{(1+\sqrt{5})\,.\sigma} = \frac{2r.[\,L=hf\,]}{(1+\sqrt{5})\,.\sigma} = \frac{hf}{2\pi f} = [\frac{h}{2\pi}] \equiv$ **SPIN** , where L = h f = Constant
and Frequency related to Φ is → $\mathbf{f_n} = [\frac{2}{\pi^2 r^4}]\,.\bar{B} \equiv [\frac{1+\sqrt{5}}{2}]\frac{\sigma}{2\pi r} \equiv [\frac{\Phi\,\sigma}{2\pi\,r}]$ …(7a) → ***Occupies the Property of the Golden-Ratio-Pattern*** Φ , and equation (7-7a) defines that Material Point of frequency $\mathbf{f_n}$,*when collide with another* Material Point , *or with another Particle or particles* then Produces another monad as → **1 ≡** ***New Quaternion*** and the first continuous to be of the same Identity , ***frequency*** $\mathbf{f_n}$, as before and from Euler`s , *rigid body dynamics work* $W = 2L = \bar{B}\,.\,\bar{w} = J\,.\,w^2 \equiv h.\,\mathbf{f_n}$ ← i.e.
The Frequency of Photon , ***embodied with the → Growing-Golden-ratio-pattern*** Φ **Uses** ***the Vibrating Physical Structures ,*** *the Granular Material-Instruments* **, to Kick Start energy on** ***all of them and everything in this World .*** The How is in [86]

2c... 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- , [O , OA] is the Common-Circle , DP the STPL line , DA tangent to the circle , OI is Perpendicular to DP , IT = IM is the tangent to the circle and P , any other Point on 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 Pythagoras theorem then $DM^2 = DI^2 + MI^2$
and issues $DO^2 = DI^2 + OI^2$, or →
$\mathbf{DO^2} = DM^2 - MI^2 + OI^2 = DM^2 + [OI^2 - MI^2] = DM^2 + [OI^2 - IT^2] = \mathbf{DM^2 + OT^2}$ **i.e.**
$\mathbf{DM^2} = DO^2 - OT^2 = DO^2 - OA^2 = \mathbf{DA^2}$, or **DM = DA , 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 < PM`O = 90^0

Remarks :

1.. The Tangent DA from Point P denotes the , Power of Point D to circle [O , OA = OT] ,

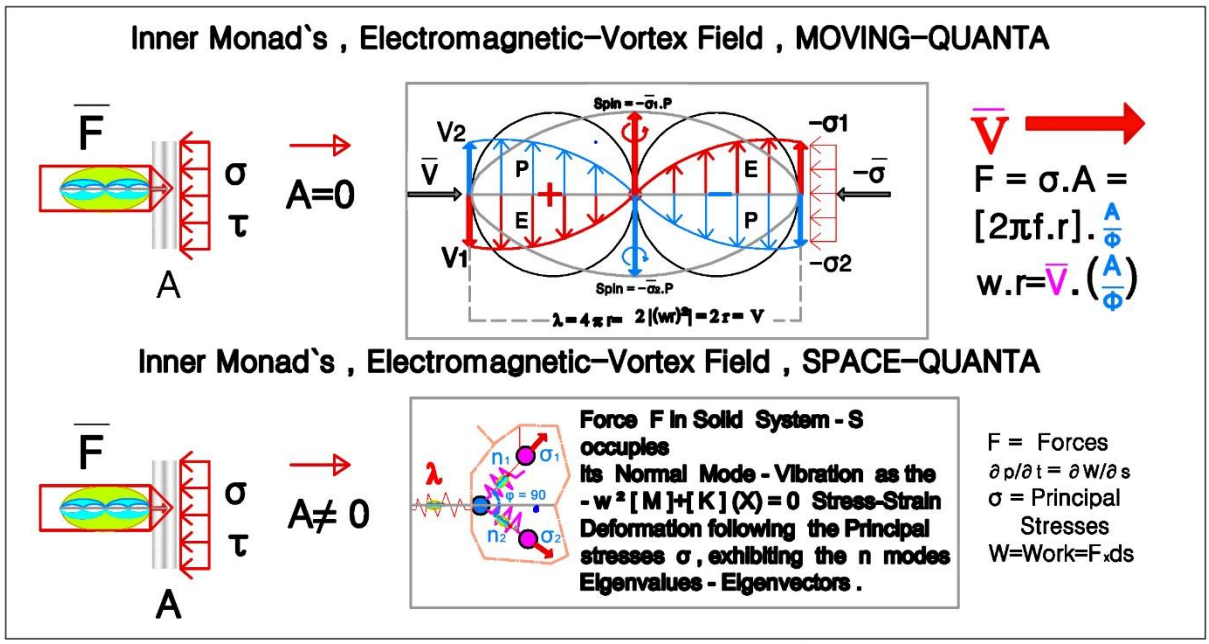
or $P_O^D = DA^2 = MD^2$, and $P_O^P = MP^2 = PM`^2$ (1)

2.. On triangle DMP where MI is the height , issues Pythagoras relation $\frac{MD^2}{MP^2} = \frac{DI}{PI} = \frac{P_O^D}{P_O^P}$ …(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 , $\frac{P_O^D}{P_O^P} = \frac{DI}{PI} = \frac{+\overrightarrow{DI}}{-\overrightarrow{PI}}$ 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 → Charge $_D = +\overrightarrow{DI}$, and **Charge of Point P** is → Charge $_P = -\overrightarrow{PI}$. i.e.
The Physical Interpretation of Point-Charge is the Positive-Linear-Vector ,+ $\overrightarrow{DI}$, and the Negative-Linear-Vector , - $\overrightarrow{PI}$. which are the Interactions from the two Points in loop DP.

4.. In Material-Geometry the [⊕]Charge Attacks [⊖] 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 [⊕]←a→ [⊖] exist in Standing-Wave as the Four-Forces of SM.

Figure -4- : The Energy-Space , **Stress-Strain** in wavelength **λ = 2πr ,** of a moving Photon :

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

1.. 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 $\bar{v}$. The force $F = \sigma.A \rightarrow \bar{p}$ vector $= M.\bar{v} = (m\lambda).\bar{v} = [m\,c\,.T]\,.\,\bar{v} = [m\,c\,/\,f)\,.\,\bar{v} = [m\,/\,f\,].c.\bar{v}$, ***i.e. Force*** **F → *becomes a Velocity-Vector*** $\bar{v}$ **or , a Force as Stress σ , enters in Space Φ** as [σΦ] and **becomes frequency** $\bar{f} = \frac{\sigma.\Phi.r}{2\pi.r_n}$ and exists Force $F = \sigma.A = [\frac{2\pi rf}{\Phi}].A = w\,r.[\frac{A}{\Phi}] = \bar{v}\,[\frac{A}{\Phi}]$, which Force F becomes a moving Storage .

2.. For area A > 0 , *Force* **F** *which is an Energy-Space-cave* , resolves 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 equilibrium equation $\mu.\nabla^2u + (\lambda+\mu).\nabla.[\nabla.u] = 0$

3.. 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* $\bar{v}$, this velocity-vector $\bar{v}$ 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 an Discrete Energy-Packet which is the Rim L_v .

4.. 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***

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 Stationary-gravity **g** as f_n , acting on Spin as $\mathbf{S_{PA}}.r^4$. The Proof **Centripetal Force** $F_c = mv^2/r = 1.(wr)^2/r = w^2.\ r = \pm\,\boldsymbol{\sigma} = (2\pi.f_1)^2.\ r = \sigma_1$. $[1\pm(\sqrt{5})]\ /\ 2$ and $w^1 = f_n = \frac{[(1+\sqrt{5})\sigma]}{4\pi r}$. From Kinetic energy = $E = \frac{mv^2}{2} = \frac{1.w^2.r^2}{2} = h\,f$, then $w^2 = \frac{2E}{r^2}$ and $E = \frac{[(1+\sqrt{5})\sigma r]^2}{2}$, $f_n = \frac{[(1+\sqrt{5})\sigma]}{4\pi r}$ and $\mathbf{2}.\bar{B} = \pi r^3 \Phi\sigma$, then **force** f_n orients **Spin** $\bar{S}$ to $\bar{B}$ as ,

$$\rightarrow \bar{g} = f_n \times \bar{B} = |f_n| \times |\bar{B}|.\sin\theta = \frac{[(1+\sqrt{5})\sigma]}{4\pi r}\ \pi r^3 \Phi\sigma\ .1 = \frac{[\sigma^2 r^2 (1+\sqrt{5})\Phi]}{8} = \left[\frac{\sigma.r.\Phi}{2}\right]^2 \quad \ldots..(g)$$

Equation (g) which is Gravity constant **g** , is the permeable Path for inner stress **σ** , to ***pass the Material`s-point*** a surface $4\pi r^3/3$ 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 $G = k_E\, g = g.[k_R\, g_R]$ 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 $\boldsymbol{\sigma} = \frac{\mathbf{F}}{\mathbf{A}} = \frac{2\pi r f}{\Phi} = \frac{w\,r}{\Phi} = \frac{\mathbf{v}}{\boldsymbol{\Phi}}$, velocity vector in a 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 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 ,$\bar{\mathbf{B}}$, is equal to spin **S** , b*ecause 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.π.c } which is the minimum Number relating Lines and Surfaces .

Analogous happens in equation (c) when v = c , and → r = c .
From Inner-velocity equation $v = w.r = (2\pi / T).r = 2\pi.f_1.\ r$, of fundamental frequency f_1 , of wavelength $\lambda = c.T = c / f_1$, and cave $r = n.[\lambda/2]$, then $r = n.(c/2f_1)$ and $\mathbf{v} = 2\pi.f_1\ .\ [n.c / 2f_1] = \mathbf{n.\pi.c}$ or $\mathbf{v = n.\pi.c}$ ……..(π)

Equation (π) shows that velocities in lobes are , **n.π** 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.π.**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 → Explain How the Planets move around the Sun But NOT the WHY.
Newton`s Laws → Explain the WHY by filling this Gap by a Force $F = G.m_1.m_2/r^2$. acting instantly between the bodies that are moving around each other But NOT their Nature and NOT the HOW Force is Acting .
Markos-Spaces → 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*** , $\bar{v}.[\boxed{\bar{f}_n} + f_n] \equiv |\frac{\mathbf{v}}{\boldsymbol{\pi}^2.\mathbf{r}^4_{\mathbf{n}}}|.\boxed{\bar{B}_n} + |\,\bar{c}\,|\ f_n$, 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 the 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 is done an effort of the Cosmic-Particles-Origination .

5.. The Four Forces : Material-Point is the **Attack** of the [⊕] → to [⊖] and from a different Voltage as **Forces** $\equiv \sum^{+}_{-} = +-,\ \sum^{+}_{+} = ++,\ \sum^{-}_{-} = --,\ \sum^{+++}_{+} = +++,\ \sum^{---}_{-} = ----$ and happening in ***Standing-Wave-caves*** and in ***Travelling-Wave-caves ,*** as **motion** .
From above equation (4) is seen that , since Particles are Waves therefore occupy the Energy-Storages either Moving or in Not-Moving .

D.. THE PHOTONS :

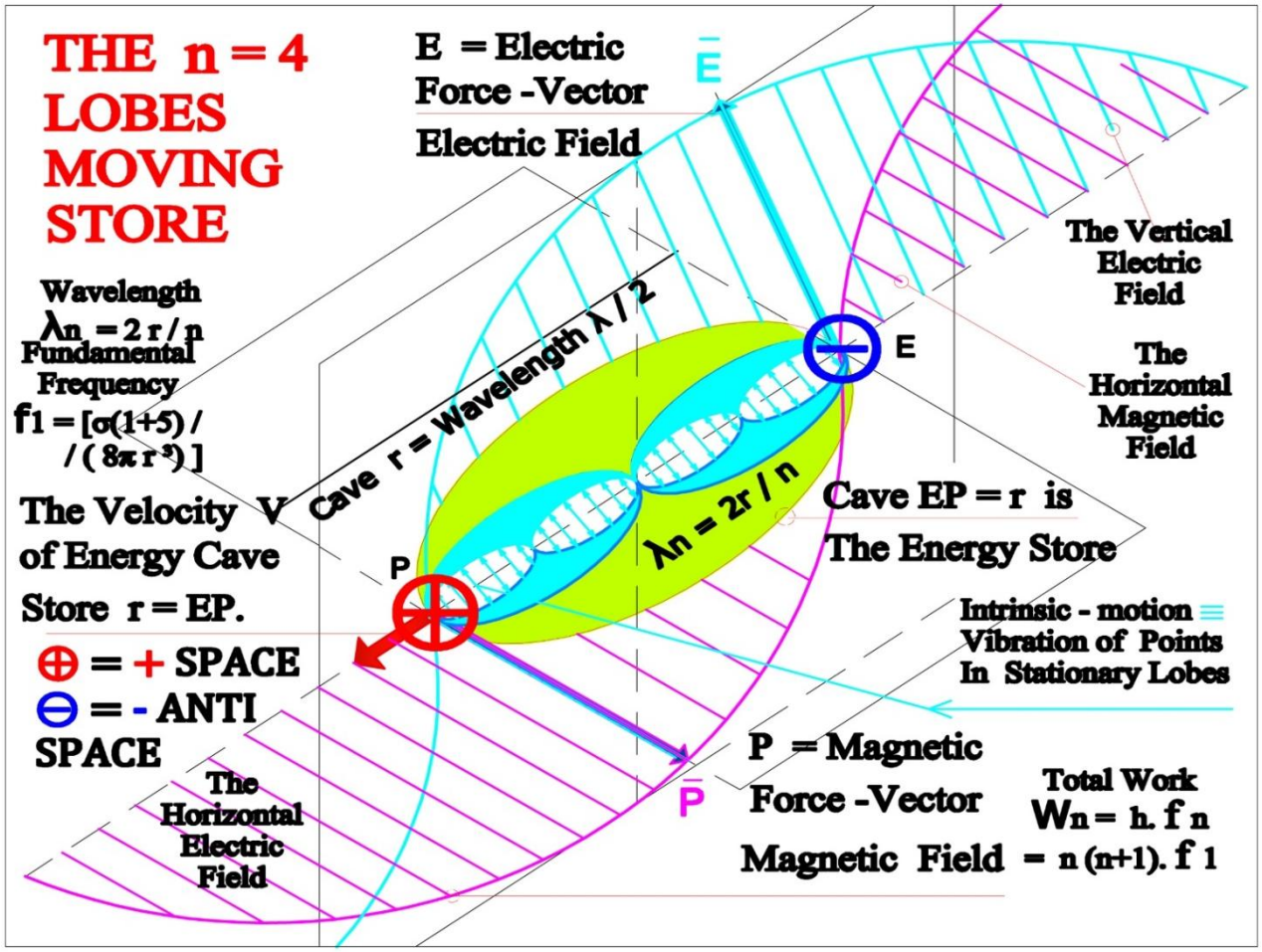


Figure - 5 - : The Propagation of Photon-Electromagnetic-Field-Storage EP :

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

Propagating with $\bar{v} = \lambda_n . f_n = \bar{c} . [\ \frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}\ ] = \frac{\bar{c}.\sigma}{2\pi r} + \frac{\bar{c}.\sigma\Phi}{2\pi r} = \{\ \bar{c} . \boxed{\bar{f}_n} + \bar{c} . f_n\ \}$, where for frequency $f_p = \frac{\bar{c}.\sigma}{2\pi r} = \frac{\sigma^2\Phi}{2\pi r} = f.\Phi = \frac{2n.\bar{B}}{\pi^2 r^4} = \frac{\sigma\Phi^2}{2\pi r}$, **as Particle** , where velocity $\bar{v}$ = w.r ,follows the ***Breakage-Principle*** which is Quaternion $\bar{z} = [\ s + \bar{v}\ \nabla i$ or $\rightarrow s^2 - |\bar{s}|^2 + 2|s|^2 . \nabla i \leftarrow \equiv$ $[\varepsilon E^2 + \mu B^2]$ **≡ The Energy-monad , EP , and as a Wave** as , $f_p = \frac{\bar{c}.\sigma\Phi}{2\pi r} = \frac{\sigma\Phi^3}{2\pi r} \equiv \frac{2.\bar{B}}{\pi^2 r^4}$

Matter (+) ≡ Magnetic-field → [μB^2] ≡ The Storage-Basket

Antimatter (-) ≡ Electric-field → [εE^2] ≡ The Moving-Basket

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

The Stationary-Cave-lobes , consist the **Particle-Photon** as the Inside **motion , in the cave r = n [λ/2] Energy-Storage , and [E² + H²] = 2.(2r).c. sin 2[φ ≡ $\frac{\bar{B}}{\Phi}$]** , the **Wave-Photon** . ***Energy-Storage-monads*** are consisted of the above **Three-constituents** all-together ,

Or each-one of them . The Work ratio is → $W_n / W_1 = f_n / f_1 = n(n+1) . [v_n / v_1] =$

$n(n+1) \frac{\lambda_n f_n}{\lambda_1 f_1} = n(n+1) \frac{n.\lambda_n f_1}{2r.f_1} = n^2(n+1) \frac{\lambda_n}{2r} = n(n+1)$ and

for $\lambda_n = 2r$, then $v_n = v_1$, and then **n . λ_n = 2.r** **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 $E^2 + H^2 = B^2$. Photon →$\{\ \bar{c} . \boxed{\bar{f}_n} + \bar{c} . f_n\ \}$

From Mechanics , the ***Only - Possible motions*** are , ***the*** **Periodic-Excitation** , and ***the*** **Revolving-Motion** therefore all ***Moving-Energy- Stores travel*** as ***a Wave and*** **Not** as a ***Particle*** **.** The **n** , **Energy-Tanks** , the N Antinodes in its moving Store $2\lambda = r = h / p$

≡ [f_1 ,f_2, $f_n = w^2$ ≡ **n** lobes] follows the *Stationary-Wave-Nodes-Principle,* i.e.

The Glue-Bond-Stress *Rotation of opposites on* Small - circles *creates* , n ,**Integer number of lobes , *which is the Wave-Nodes-Principle of the moving-energy-stores***, one of which is the Photon . The {n} **Energy - Storages** of The Moving – Monads . Figure -4-

In Electromagnetic field , EM-field , **Magnetic-field is the Storage in which Energy ≡ motion is Stored , and Electric-field is the Force ,** *The Energy* **, which Pushes the [Energy-Store- Basket ≡ The Magnetic-field] ,** executing the **Helicoid motion .**

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

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

$f_4 = \frac{4\,v}{2r} = 4f_o$, and $W_4 = \frac{h}{2r}\,v_4$, *and for* → Loop-Total-Work , $W = [\frac{4\pi r^2 f1}{3}].n.(n+1)$

or $W = \frac{80.\pi r^2 f1}{3}$, and from Photon → $\{\,\bar{c}\,.\,\boxed{\bar{f}_n} + \bar{c}\,.\,\mathbf{f_n}\,\}\leftarrow v_4 = \lambda_4.f_4 = 4.\lambda_4.f_o$,therefore for ,

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

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

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

n = 4→ $f_4 = 4.[\frac{\sigma(1+\sqrt{5})}{4\pi r}]$,Wavelength $\lambda_4 = \frac{2\,r}{4}$, 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 $f_n = n.\,f_o$, **n** , times the fundamental frequency .

Electromagnetic waves are created by the vibration of an Electric-charge . In Material – Point , The eternal rotation of the ⊕ constituent around the ⊖ constituent creates the , **n** Energy-lobes in a Tank $r = n\,\frac{\lambda}{2}$ or $\lambda = \frac{2r}{n}$, since the velocity of the wave is $\bar{v} = \lambda/T = \lambda \times f$. The frequency is $f = \frac{n.\bar{c}}{2\pi.r}$ where **n** is a positive integer number . Because in lobes the inner particles are the [+] , [-] constituents of , Space and of Anti-space , the maximum amplitude

of each constituent is related with its Position and each Amplitude oscillates periodically as the

wave equation , $\mathbf{x = v_o\,.\sin wt} = A\,.\,\sin[\sqrt{(a/Am).t} + \pi/2]$ ……..(1) where

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

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

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 → $\partial E/\partial t$, $\partial H/\partial t$ ← *and when reduced to one line as ,* $\mathbf{E = H\,c}$

$E \rightarrow \mathbf{\partial E/\partial t} \rightarrow H \rightarrow \mathbf{/\partial t} \rightarrow \mathbf{H}$.

This vibration of opposites creates a Wave which has both an Electric , **E** , and an Magnetic component , **H** , perpendicular each other and is as

$[\,E^2 + H^2\,] = 2.(2r).c.\mathbf{\sin 2\varphi}, [\varphi \equiv \frac{\bar{B}}{\Phi}]$ …..(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 ≡ $[\,E^2 + H^2\,] = 2(2r).c.\,\mathbf{\sin 2[\varphi \equiv \frac{\bar{B}}{\Phi}]}$, of wavelength λ , ***Outward* λ** , as ***The Outer Electromagnetic-Wave*** → {**The-Wave ≡** $[\varepsilon E^2 + \mu B^2] = 2.\lambda c.\sin.2\varphi\}$ ← and allows all the **Energy-Wave-Storages** to Propagate any Distance in Vacuum without any dissipation .

This Inner-motion ≡ Work W , from the Wave-Energy-Pattern with Wavelengths $\boldsymbol{\lambda_n}$, is created from all ± 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 →** $\mathbf{[\pm s^2] = [MFMF] \equiv}$ ***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 ≡ cave , so exists in **Vectors** the **Quantum-Constant-Work** → $\mathbf{k = \bar{v}x\bar{v}.\,\bar{r} = v^2.r}$, 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 $k = v^2.r = (w\,r)^2.r = [\frac{2\pi}{T}r]^2.r = \frac{4\pi^2 r^2}{T^2}.\,r = \frac{4\pi^2 r^3}{T^2} = 4\pi^2.\,\frac{r^3}{T^2} = 4\pi^2.r^3.\mathbf{f^2_p}$ →

which are the universal ***Kepler Laws for macrocosm***.

For Unit-Stress-Gravity **g** , as $k = E = \frac{T^2}{a^3} = g = \frac{1}{f^2.\,a^3}$ and for a = r then $g\,.r^3.\mathbf{f^2_p} = 1$,

which is the ***Kepler second constant-Unit-law for Areas*** .

i.e. Photon during Motion in [MFMF] ***Chaos collides with other*** **Photons ,** *by means of Cross Product* **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 , the 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 ≡ 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 $E = h\,f = h.(c/\lambda)$, 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 ≡ motion ← .

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 [⊕↻↺⊖] of the ⊕ constituent around the ⊖ 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** $\mathbf{f_p} = \frac{\sigma = [\sigma\Phi]}{2\pi r} = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\sigma.\Phi}{2\pi r}$, from Intrinsic **Angular-Momentum-Vector** relation $\bar{B} = \frac{2L}{\bar{w}} = \frac{L}{\pi f} = \pi^2 r^4$. $f = [\frac{h}{2\pi}]$ = **SPIN - S** , of Particles , From $\bar{v} = \frac{G\,\Phi}{A} = \sigma\,\Phi = \bar{c}$ the **Light-Velocity** and From **a** $= \sqrt[3]{1/g\,f_R^{\,2}}$ **The-Hydrogen-cave** , and from $E_R = \frac{1}{a^3}[\frac{4\pi^2}{c^2} + \frac{S^2}{2m}]$ the **Atoms-Molecules** .

i.e. Photon is an **Energy-Spring-Store** , **r** ,in a Stationary-wave of wavelength **$n\lambda = 2r$** , and 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 [$\bar{v}\,\boxed{\bar{f}_n}$]→ $\lambda = 2r/n$** , and [+] Electric-field as Space-motion and [-] Magnetic-field as Anti-Space-Store [$\bar{v}\,\mathbf{f_n}$] .[70]

1d... The Duality Of Isochronous Photons .

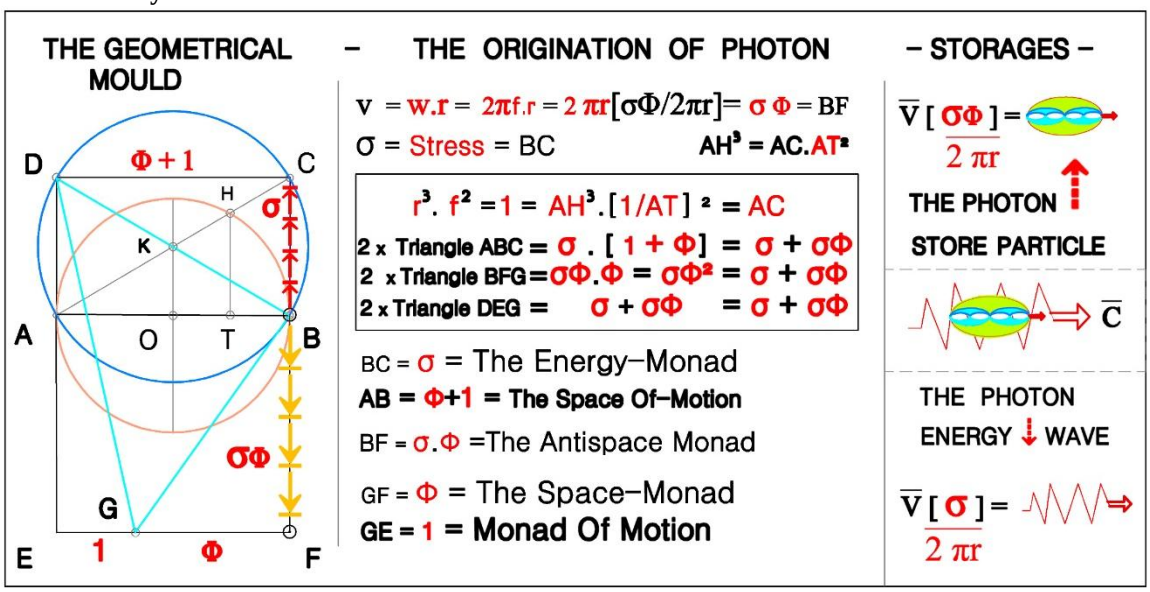


Figure – 6 - : The Material-Geometry **Mechanism-of-motion** in Photons-Cave :
FROM MECHANICS **The Eternal-Rotation** of the Two Elements , [⊕↻↺⊖] , Up

or Down in the Material-Point circles ,Originates the Spins , $\pm\frac{1}{2}$, ± 1 , $\mp\frac{1}{2}$, of All Particles , Fermions or Bosons , which combine from the above Three-States just by Adding their Spins [36] .From Cauchy-Stress-Tensor under Plane-stress-conditions ,The **Equation of stresses** $\sigma 1,2$, is $\sigma 1 / 2 = \pm (½) .\sqrt{\sigma 1^2 + 4.\sigma 1^2} = \sigma_1 .[1\pm(\sqrt{5})] / 2 = \sigma.\Phi$ which is the ***Golden-ratio-Pattern*** of the Material-Point as Type of a vanishing-shear due to layers laterally shifted . This minimum quantized energy $\boldsymbol{\sigma}$, 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 $\mathbf{S_{PA}}.r^4$. The Centripetal Force is equal to Stress σ , so $F_c = mv^2 / r = 1.(wr)^2/r = w^2. r = \pm\sigma = (2\pi.f_1)^2. r = \sigma_1 . [1\pm(\sqrt{5})] /2 = \Phi.\sigma$, and since $m = \frac{\sigma}{w^2.r} = \frac{\sigma}{w.c} = \frac{\bar{B}}{r.c}$ then , $\pm\boldsymbol{\sigma} = \frac{\mathbf{c}.\bar{\mathbf{B}}}{\mathbf{r}^2}$ 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 $AT = g.\sin\varphi$ and since $\sin\varphi = \frac{s}{4r}$ then $AT = g . \frac{s}{4r}$. Since acceleration $a = \frac{d^2s}{dt^2} = \frac{dv}{dt} = \frac{d}{dt}(\frac{ds}{dt}) = - g. \frac{s}{4r}$ then $\frac{d^2s}{dt^2} = - g . \frac{s}{4r}$ **or** $\{\ddot{s} = - w^2\ \dot{s}$ *where* $w = \frac{2\pi}{T} = \frac{g}{4r}\}$ …(a) which is a Harmonic Oscillatory motion showing that Acceleration is proportional to displacement and is directed towards the origin with a period $T = \frac{2\pi}{w} = 2\pi.\sqrt{\frac{4r}{g}} = 4\pi .\sqrt{\frac{r}{g}}$, or and $\mathbf{w^2 = [\frac{g}{4r}]^2}$, where $w = 2\pi f$.

Origination of Frequency , *or Period* , happens from above Property where $\mathbf{[\frac{g}{4r}] = 2\pi\ f .}$ In Material-Point the Cycloidal-acceleration g_{cyc} is transformed as Centrifugal acceleration $\mathbf{g_{cyc}} = \frac{(v)^2}{R} = \frac{g}{4r}$, where **r** = the Radius of the Cycloidal-circle and **R** = the radius of curvature

In Cycloid velocity-vector $\bar{v} \equiv \bar{\sigma}$, the Glue-Bond-Stress between the Opposites $\oplus$, $\ominus$ so $\bar{v} = \bar{w}.r = 2\pi.\bar{f}.r = \bar{\sigma} = \sigma\Phi$, Frequency $\bar{f} = \frac{\bar{\sigma} = [\sigma\Phi]}{2\pi r}$ and Total-Energy $2L = J.w^2 = 4\pi^2.f^2$ $w^2 = \frac{(\sigma\Phi)^2}{r^2} = [2\pi f]^2$, or **Frequency of Photon** $\mathbf{f_p} = \frac{\sigma\Phi}{2\pi r} = \frac{[1+\sqrt{5}]\sigma}{4\pi r} = \frac{\boldsymbol{\sigma.\Phi}}{\mathbf{2\pi r}}$ …(**a**) 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 $\bar{B} = r.mv = r\frac{\pi.r^4}{2}2\pi f\ r = \boldsymbol{\pi^2.r^4\ .f}$

From momentum relation $\bar{B} = m\ r\ v = m\ r^2\ w = m\ r^2\ (2\pi f) = \frac{J.w}{2} = [\frac{\pi r^4}{2}].[2\pi f]$ then **Spin S** ≡ **Angular-momentum** $\mathbf{\bar{B} \equiv \bar{S}} = \frac{J.w}{2} = \frac{\pi r^4}{2}[2\pi f] = \pi^2.r^4\ .[\ f\ ] \equiv \frac{[1+\sqrt{5}\ ].\sigma.\pi.r^3}{4} = \frac{\boldsymbol{\pi r^3\Phi.\sigma}}{\mathbf{2}}$ …..(**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 → $\oplus\leftrightarrow\ominus \equiv 1+\Phi$ and

BC = |σ| = 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 = |Φ.σ| = **The Anti-Space-Vector** , and FG = |Φ| = The **Space-Vector** magnitude .

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

Triangle 2(ABC)=BC.BA= σ.[Φ+1] ≡ σ.Φ + σ = [**Stress-In-Storage-Φ]** + [**Moving-Stress]**

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

Triangle 2(BFG) = FB.FG = σ.Φ[Φ] = σ.Φ² = σ.[Φ+1] ≡ σ.Φ+ σ ≡ $\mathbf{S}_{storage} + \mathbf{M}_{motion}$

Triangle 2(DEG) = EG.ED = σ +σ Φ = σ.[1+ Φ] ≡ σ.Φ + σ ≡ $\mathbf{S}_{storage} + \mathbf{M}_{motion}$ and since Energy = motion / T ≡ $(\frac{v}{2\pi r})$. [σ +σ Φ] = $\bar{\mathbf{v}}$. **[** $\frac{\boldsymbol{\sigma}}{\mathbf{2\pi r}} + \frac{\boldsymbol{\sigma\Phi}}{\mathbf{2\pi r}}$ **]** ≡ $\bar{\mathbf{v}}$. **[**.$\boxed{\bar{f}_n}$ **+** $\mathbf{f_n}$ **]** ≡

Moving - Storage →[$\bar{\mathbf{v}}$.$\boxed{\bar{f}_n}$ **]**← + Moving-Frequency → [$\bar{\mathbf{v}}.\mathbf{f_n}$] ← ≡ Material-Point i.e.

The Energy produced in Photon-Cave is consisted of **Two-moving-Storages** , that travelling **as Particle** **[** $\bar{\mathbf{v}}$.$\boxed{\bar{f}_n}$ **]** → [$\bar{\mathbf{v}} = \bar{\mathbf{c}} = \lambda\frac{f}{\Phi}$] → [S ≡ EM-R ≡ $f_{1=N}$, f_2 , f_3, f_D ,,$f_n = w^2$] and ,

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

and the Duality of an **Energy-Storage S** $\equiv \{\boxed{[\oplus \leftarrow \mathbf{r} \rightarrow \ominus]}$ + **Motion M** $\equiv \boxed{\bar{\mathbf{v}} - \mathbf{Vector}}\}$

Therefore → Photon is travelling Both as Particle and as Wave , as

1.. **Energy-Storage** $\mathbf{S} \equiv \boxed{[\oplus \leftarrow \mathbf{r} \rightarrow \ominus]} \equiv$ **Particle** $[\bar{\mathbf{v}} . \boxed{\bar{f}_n}] \rightarrow [\bar{\mathbf{v}} = \bar{\mathbf{c}} = \lambda\frac{f}{\Phi}]$ → i.e. **a Stationary Standing - Wave** → [S≡ [EM-R ≡ $f_{1=N}$, f_2 , f_3, f_D ,,$f_n = w^2$] .

2.. **Energy-Motion M** $\equiv \boxed{\bar{\mathbf{v}} - \mathbf{Vector}} \equiv$ **Wave** $[\, \bar{\mathbf{v}} . \mathbf{f_n} \,] \equiv [\, \mathbf{f_1} = (E^2+H^2) = n\frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\bar{B}}{\pi^2 r^4}\,] \rightarrow$ i.e. **a Propagating Wave** $\{W \equiv EM\text{-}R \equiv [\varepsilon E^2 + \mu B^2] = 2.\lambda c.\sin.2\varphi [\, \varphi = \frac{\bar{B}}{\Phi}]\}$.

The Physical-Interpretation of $\mathbf{f_{Photon}}$:

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

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

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

and →→→ **Primary-Energy** $\equiv \mathbf{G.f_P} \equiv \mathbf{h}$ and OR $\mathbf{G^{-1}x\ \sigma\ x\ \Phi^3 \equiv 1}$ ←←← *where*

G ≡ The Newton`s-Universal Force = $6{,}680561.10^{-11}$ m3/Ns²

σ ≡ The Glue-Bond-Stress in Material-Points $\boldsymbol{\sigma} = \frac{2\pi r f}{\Phi} = 1{,}85.10^{-11}$ Kg/m2 and , f ,

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

in Planck`s Length $L_p = e^{-\,i.(5\pi/2).10} = \{\ \sqrt{3}.\pi.\ \mathbf{1{,}616199}.10^{-35}$ m }

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

It is seen that , in Universe exists the only one Force $G \equiv \sigma.\Phi^3$, which is Acting on all **Quantized-Quantities** → $\mathbf{G \equiv \sigma.\Phi^3 \equiv \Phi^2.[\{\sigma\ \Phi\} \equiv 2\pi f_P\, r \equiv w\, r \equiv \bar{v} \equiv m\, a = \bar{c}\ ]}$ ← and

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

i.e. Universe is a Monad , Becoming from **a HUGE-MAGNET** of Opposites ⊕ , ⊖ which Forms >→ The **3**-Dimentional **SPACES Φ** , **ANTI-SPACES** $|\mathbf{\Phi.\sigma}|$, and >→ The **ENERGY ≡ MOTION** through the **G -** Force and Stress - **σ** becoming from Photon.

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

Remarks on the **Duality-Photon** → $\{\, \bar{\mathbf{c}} . \boxed{\bar{f}_n} + \bar{\mathbf{c}} . \mathbf{f_n} \,\}$ ← ≡ → Particle + Wave ←

a.. From equations $f = \frac{\sigma_1 \Phi}{2\pi r}$ and $\sigma_1 . [1 \pm (\sqrt{5})] / 2 = \sigma.\Phi$, then **Frequency** $\mathbf{f_P}$ of Photon is Independent of the Amplitude $[\varepsilon E^2 + \mu B^2]$ 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 , **Is a Source** that **Gives Energy** as Energy-Storage , and **Information** as Propagating - Energy .

c.. **Photon** in the Microcosm of Hydrogen - Cave can-**Give** such **Potential-Energy as Resonance-Energy–Frequency** $\mathbf{f_R}$ **,** as that Energy in **[Bracket – Orbit - Hook] which Joints the Atoms to produce** the **Molecules** .

d.. **Photon** striking on **Hydrogen-Cave** can Produce a **Resonance-Energy–Frequency** $\mathbf{f_R}$ **,** such that can produce **Photos** and **Images** of Inter-Atom or any other Structures .

e.. **Photon** striking on **Cells** can Produce a **Resonance-Energy–Frequency** $\mathbf{f_R}$ **,** such that can **Enter Cell** and **Break-It-Up.** Duality-Photon places $\boxed{\bar{f}_n}$ Store everywhere.

The ***Kinetic-Energy*** E_K of a moving Material - Point , *as this is the Photon* , is stored as motion in its Storage , **r** = [n λ/2] with the , **n** frequencies $f_n = n\,.\,f_1$, with **n** lobes and fundamental frequency 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 ≡ Energy Storage **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 ,**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] .

2d... The Origination of Stresses σ :

Gravitational-Constant-Force G , becomes as Stress ≡ Force/Area ≡ **g** , as equation

$G = gk_E = g\,.[g_E\,k_E] = [\frac{T^2_P}{a^3}].[g_L\,k_L] = [\frac{c.r^3}{a^3}].[g_L\,k_L] = 9{,}8076925 * 6{,}8116.10^{-12} \equiv 6{,}68056.10^{-11}\,\frac{m^3}{Ns^2}$, and **Effects on gravity →** $\mathbf{g} \equiv 9{,}8076925$ **Stress** $\frac{Kg}{cm^2}$ [73]

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

Stress in Beyond-Planck-Length : Force is → $\mathbf{F} = \Phi^3.\boxed{[\oplus\,\sigma\,\ominus]} = \mathbf{\sigma\ x\ \Phi^3}$ where , $\sigma \equiv \boxed{[\oplus\,\sigma\,\ominus]}$ ≡ **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 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 $\boldsymbol{\sigma} = \frac{2\pi rf}{(n)\Phi} = \frac{2\pi rf}{1.\Phi} = \frac{2\pi.1{,}616199.10^{-35}.2{,}93949410^{42}}{1{,}6180339} = 1{,}84456315.10^{8}$ t/m2 $= 1{,}84456315.10^{11}$ Kg/m2 , and the Angular velocity , w, of Total-Planck Cave is , $|w| = \frac{\sigma}{2r}\,[\,1+\sqrt{5}\,] = (\frac{1{,}852816510^{11}}{2.1{,}616199.10^{-35}}).1{,}6180339 = 9.274599.10^{46}$, rad/sec then

Stress Outside Planck`s-Length-cave → $\mathbf{\sigma_{Pl}} = 1{,}84456315.10^{11}$ Kg/m2 , and $\mathbf{G} = \sigma\ x\ \Phi^3 \equiv [1{,}84456315.10^{11}]\,.\,[3{,}6180339887] = \mathbf{6\,,\,673692.10^{-11}}\ \frac{m^3}{Ns^2}$, *Nevertheless* , For Earth-System mass $M_E = 5{,}9723.10^{24}$ Kg , and for Area → Radius 6378,137 Km $= 6{,}378.10^{6}$ m then Earth-constant $\mathbf{k_E} = \frac{[6{,}378.10^6]^2}{5{,}9723.10^{24}} = 6{,}811551810^{-12}$ and Gravitational Force $\mathbf{G} = g.k_E \equiv g\,.[g_L\,k_L] \equiv [\frac{T^2_P}{a^3}].[g_L\,k_L] \equiv 9{,}80769.\mathbf{6}{,}8115518.10^{-12} = \mathbf{6{,}68056.10^{-11}}\ \frac{m^3}{Ns^2}$

Remarks :

a.. The Stresses become from a Force and a Surface as equation $\sigma = \frac{F}{A}$, and in the case of Gravitational constant G and a cave , r , then → $\sigma = \frac{G}{4\pi r^2} = \frac{G}{\pi(2r)^2} = \frac{G}{\pi s^2}$, or vector **s** . Above relation means that Force G needs a Vector-surface $\pi.s^2$ to be spread as Stress σ which is the case of Constant-light-velocity **c** as the ***first Surface*** .

b.. The case of a vector 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. $G \equiv \sigma.\Phi^3 \equiv \Phi^2.[\{\sigma\,\Phi\}] \equiv [\frac{2B}{\pi r^3}] \equiv 2\pi f_P\,r \equiv w\,r \equiv \bar{v} \equiv m\,a \equiv m\,g = \bar{c} = \frac{2.B}{\pi r^3}$]

c.. Since Stresses follow equation $\sigma = \frac{F}{A} = \frac{2\pi rf}{\Phi}$, conclusively **Forces and Areas** are every-where and are related to any-cave r through , **f** , which is the mean of **every-Information**.

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

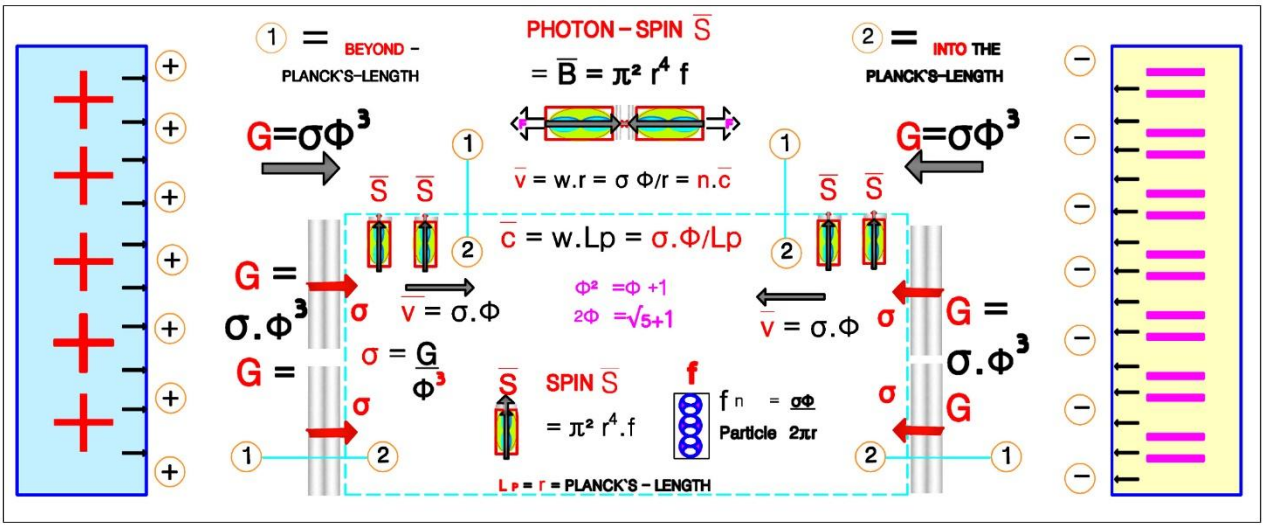


Figure – 7 - : The light-velocity-Mechanism in Material-Geometry **and The Photons :**
In (1). Is The Beyond-Planck`s-length-Region where exists , The Gravitational-Constant **G**

which is **the Force** G . The Photon is **Particle + Wave ≡ Energy** with light-velocity and its Duality is in frequency where $\bar{\mathbf{v}} = \bar{\mathbf{c}}.[\boxed{\bar{f}_n} + \mathbf{f_n}]$. The Material-Points with velocities $\mathbf{n}.\bar{\mathbf{c}}$, are as $\bar{v}_m = n.\bar{c}\{\boxed{\bar{f}_n} + f_n\}$, where $\boxed{\bar{f}_n}$ is the Stationary-Storage and $[f_n]$ is the Propagating Electromagnetic-Radiation where $\bar{\mathbf{E}} = \bar{\mathbf{B}}$ c .

In (2).. Is the Planck`s-length-Region in-where **Exist** → The Photon **Particle + Wave ≡ Energy** ,with light-velocity and the Duality in frequency as $\bar{\mathbf{v}} = \bar{\mathbf{c}} . [\boxed{\bar{f}_n} + \mathbf{f_n}]$.

The Primary- Particles Fermions and Bosons , with their Spin $\bar{\mathbf{S}}_{\mathbf{F}}$ and according to their frequency $\mathbf{f_F}$ is their velocity → The Constant-Light-velocity $\bar{\mathbf{c}} = \frac{\mathbf{G}}{\mathbf{\Phi^3 L_P}}$ → The Hydrogen Cave He from $g.r^3$. $\mathbf{f^2_p} = 1$ → The Electron-Charge and Electron from $4\pi^2 f^2_e . m_e = \mathbf{k} = \boldsymbol{\pi}\, \mathbf{g}$ and from Kepler`s relation $4\pi.f^2_e . m_e = g$.

The Proof :

It was shown That → **The Cycloidal-acceleration** $g_{cycloid}$ is transformed as Centrifugal acceleration and becomes the frequency of **Photon** as $\mathbf{f_p} = \frac{\sigma = [\sigma\Phi]}{2\pi r} = \frac{\sigma.\Phi}{2\pi r}$, and Stress $\boldsymbol{\sigma}$ becoming from Space ⊕ to Anti-Space ⊖ as $\sigma = \frac{2\pi r.f}{\Phi} = \frac{w\, r}{\Phi} = \bar{v}$ ……(a)

It was proved that → **Photon-Travels** with velocity $\bar{\mathbf{v}} . [\boxed{\bar{f}_n} + \mathbf{f_n}]$, which is a Moving Stationary-Wave ≡ Storage →> $[\bar{\mathbf{v}} . \boxed{\bar{f}_n}]$ ← Plus **a** Propagating-Electromagnetic -Wave ≡ Storage →>$[\bar{\mathbf{v}} . \mathbf{f_n}]$ ← which is Material-Point i.e. From **Photon** → $\{\bar{\mathbf{c}} . \boxed{\bar{f}_n} + \bar{\mathbf{c}} . \mathbf{f_n}\}$ ←

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

<u>as Particle</u> $[\bar{\mathbf{v}} . \boxed{\bar{f}_n}] \rightarrow [\bar{\mathbf{v}} = \bar{\mathbf{c}} = \lambda \frac{f}{\Phi}] \rightarrow$ [**S≡ EM-R ≡** $f_{1=N}, f_2, f_3, f_D, f_n = w^2$] and ,

<u>as Wave</u> $[\mathbf{f_1} = (E^2+H^2) = n\frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\bar{B}}{\pi^2 r^4}] \rightarrow$ [**W≡ EM-R ≡** $[\varepsilon E^2 + \mu B^2] = 2.\lambda c.\sin.2\varphi$]

<u>and as Duality</u> An **Energy-Storage S** ≡ $\{\boxed{[\oplus \leftarrow \mathbf{r} \rightarrow \ominus]} +$ **Motion M** ≡ $\boxed{\bar{\mathbf{v}} - \mathbf{Vector}}\}$

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

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

From Force definition << A Force F is a **Push or a Pull** acting upon an Object as a result of its interaction with another Object >> or → in Material-Geometry

Push → → $\boxed{[\oplus \leftarrow \mathbf{Push} \rightarrow \oplus]}$ and $\boxed{[\ominus \leftarrow \mathbf{Push = Force} \rightarrow \ominus]}$ ≡ Force

Pull →→ $\boxed{[\oplus \leftarrow \mathbf{Pull} \rightarrow \ominus]}$ and $\boxed{[\ominus \leftarrow \mathbf{Pull = Force} \rightarrow \oplus]}$ ≡ Force

i.e. Both cases Push or Pull are Forces …..(c)

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

Force = **Stress** x **Area** ≡ σ x A and from (1) → $\mathbf{F = \sigma}.A = [\frac{2\pi rf}{\Phi}].A = w\, r.[\frac{\mathbf{A}}{\mathbf{\Phi}}] = \bar{v}[\frac{\mathbf{A}}{\mathbf{\Phi}}]$

and Because by definition **Angular-velocity** $w = 2\pi f$ and **velocity** $v = w\, r$. i.e. **Stress** , σ **, enters in Monad-Space** Φ as $[\sigma\Phi]$ and **frequency becomes** $\bar{\mathbf{f}} = \frac{\boldsymbol{\sigma.\Phi.r}}{\mathbf{2\pi.r_n}}$

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

Newton`s gravitational constant **G** is a Force directly proportional to the product of any two masses $\mathbf{m_1}$ , $\mathbf{m_2}$ in macrocosm and inversely proportional to the square of the distance between their centres , instead of the microcosms Coulomb`s law of , two charges $\mathbf{q_1}, \mathbf{q_2}$.

From Mechanics , 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*** $\boldsymbol{\sigma}1,2$, or is $\sigma 1 / 2 = \pm (½) . \sqrt{\sigma 1^2 + 4.\sigma 1^2} = \mathbf{\sigma_1 .[1 \pm (\sqrt{5})] / 2 = \sigma\, \Phi}$, 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 $\mathbf{F = \sigma\, \Phi^3}$, and represents the **Equal Apportion** of the **External-Force** to the **Internal-Forces** .

According to Material-Geometry Distance ≡ $\boxed{[\oplus \leftarrow \mathbf{r} \rightarrow \ominus]}$, and Stress ≡ $\Phi.\boxed{[\oplus\, \boldsymbol{\sigma}\, \ominus]}$ and for the three-Dimension extreme-cases $\Phi^3.\boxed{[\oplus\, \boldsymbol{\sigma}\, \ominus]}$ is Force $\mathbf{F \equiv \Phi^3}.\boxed{[\oplus\, \boldsymbol{\sigma}\, \ominus]}$

i.e. **Forces Beyond-Planck-Length are** $\rightarrow \mathbf{F} = \Phi^3 . \boxed{[\oplus\, \boldsymbol{\sigma}\, \ominus]} = \boldsymbol{\sigma}\ \mathbf{x}\ \boldsymbol{\Phi}^3 \leftarrow \ldots$ (**d**)

Force G → on Spinning M-Points $\bar{\mathbf{S}}$ through $\bar{g}$ → on Planck`s - $\bar{B}$ → on $\mathbf{g_G}$, through $\mathbf{f_R}$.

$G = \sigma\ \Phi^3$, and $\sigma = \frac{G}{\Phi^3} = \frac{G.\sigma^3}{c^3}$,or → $\boldsymbol{\sigma^2}\ \mathbf{G} = \mathbf{c}^3 \ldots$(**e**) , where **σ** is a Stress between frequencies.

From Force-relation $\mathbf{F} = \sigma A = (2\pi f r)\frac{A}{\Phi} = wr\frac{A}{\Phi} = \bar{\mathbf{v}}\frac{A}{\Phi}$, is seen also force G become velocity $\bar{\mathbf{v}}$. In the case of Planck`s-length velocity $\bar{\mathbf{c}} = w r = \frac{\sigma.\Phi}{r}\ \mathbf{r_p} = \sigma\ x\ \Phi = |\frac{G\, L_P}{r\, \Phi^3}.|\Phi = [\frac{G.L_P}{r.\Phi^2}]$

and from relation $\mathbf{G} \equiv \boldsymbol{\sigma}\ \mathbf{x}\ \boldsymbol{\Phi}^3$ **then →** $[\ \bar{\mathbf{c}} = \frac{G\, L_P}{r.\Phi^2}\ ]$ **which is the Light-velocity vector** .

Since r , becomes from the Beyond-Planck`s-Region then → $\bar{\mathbf{v}} = \frac{F\Phi}{A} = [\frac{G\,\Phi}{A}]$ …...(**f**)

Equation (f) may be written as Force $\mathbf{G} = \bar{\mathbf{v}}\frac{\mathbf{A}}{\boldsymbol{\Phi}}$, which is a **Viscus-Damping-Force** where $\frac{A}{\Phi}$ is a constant of Proportionality and the equation of motion as $\mathbf{F_G} = [\frac{\mathbf{A}}{\boldsymbol{\Phi}}] . \dot{\mathbf{x}}$

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

Anti-Space + Space ≡ motion ≡ $i \equiv \sqrt[2]{-1} \equiv \sqrt[4]{-1} \equiv e^{-i.(\frac{\pi}{4}).b}$ = **0,707106781 . b .**

The Base **b** , which for Natural logarithms issues << The Natural logarithm ln(x) of a Magnitude x , is the Power to which , e , would have to be raised to equal x >> and Defining that → ln(**x**) is the Period-needed to Grow **x** , as this is in Integration $\int x$. e^x is the **Amount of Growth** after **Period x** and the Possible-Repetitive-Permutations for moulds and elements which is $\mathbf{Mould^{Elements}}$ **= 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 [⊕,⊖] is $10^{[10]^2} = 10^{20}$ **Positions** ≡ Distances ≡ r and since $10^{-x} = \frac{1}{10^x}$ then b = 10^{-20} , and **Anti-Space + Space-Positions** are , $0{,}707106781.10^{-20} = 1{,}0707106781.10^{-19}$.

In this Way The Non-Dimensional-number [$0{,}707106781*10^{-1} = 0{,}0707106781$] , **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** $\pi.r^2$ =3.601588 m2 , and the **QUA-Universe** is $\mathbf{A = 3.601588 . 10^{-19}}$ m2/s ,which are The Space + Anti-Space Positions in Universe ...(**i**)

From (h) , light-velocity $\bar{\mathbf{v}} = [\frac{G\,\Phi}{A}] = \frac{6{,}673692.10^{-11}1{,}6180339887}{3{,}601588.10^{-19}.} = \mathbf{2.99819938 .10^8}$ **m/s**

i.e. Force **G** ≡ motion , is Quantized → is Spread in { **Space** and **Anti-Space }** **or ≡ QUA** ≡{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** be Proportional to the Light-velocity **c =** $\bar{\mathbf{v}}$, then the Harmonic – Oscillation is an **Dumped-Oscillator** , and **Can-Oscillate** due to the excitation as ,

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 a limiting case between the oscillatory and Non-Oscillatory motion the *Critical Damping* , and which Originates the **Light-velocity** $\bar{\mathbf{c}}$, [49]

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 ,

The **Three Elements** ≡ Digits of Material-Geometryare →{⊕ , [⊕↔⊖] , ⊖} ≡ [+, 0 , -]←

The **Permutation** , *arrangement* ,of the Two-Elements $P_1^2 = \mathbf{2}$, i.e. are → [⊕,⊖] - [⊖,⊕]←

The Three-Elements in Space need $P_1^3 = 3.(3\text{-}1).(3\text{-}2) = 6$ Positions and the same for Three-Elements in Anti-Space need $P_1^3 = 3.(3\text{-}1).(3\text{-}2) = 6$ Positions , and Total Places → $P_1^3 . P_1^3 = 6 \text{ x } 6 = 36$ 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 [⊕ , ⊖] the Growth is $10^{[10]^2} = 10^{20}$ Positions ≡ Distances ≡ r , and since issues $10^{-x} = \frac{1}{10^x}$ then **b** = 36.10^{-20} , and → $\bar{\mathbf{v}} = \frac{F\Phi}{A} = [\frac{G\,\Phi}{A}] = [\frac{6{,}673692.10^{-11}.1{,}6180339887}{36.10^{-20}.}] = 2.9995163.\ 10^8$ m/s

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

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

A… The Gravity-System , is an Infinite of ± Equilibrium-Rotating vectors $\bar{\mathbf{r}}$, where for 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 $\rightarrow \nabla x\bar{B} = \nabla x\bar{S} = 0$, or $\nabla x\bar{B} = \nabla\,\bar{r} + 2\pi\, mf.\bar{a} = 0$, and $\bar{\mathbf{r}} = \pm\, 2\pi mf.\bar{\mathbf{a}}$. Vector $\bar{r}$, occupies Both directions for Rotational-equilibrium , **i.e. The vector** $\bar{\mathbf{r}} = \pm\ \bar{\mathbf{B}} \equiv \bar{S}_n = 2\pi m\mathbf{f_n}$, and $\mathbf{f_n} = \frac{B}{2\pi\, m_e} = \frac{E}{h}$, **is the Stationary-Filling-Ocean of the Spinning-Gravity-Material Point , in the called Empty-Space** ,with frequency that of Material-Point $f_n = n.f_1 = \frac{E}{h} = \frac{n.v}{2\pi r} = \frac{n\sigma}{4\pi r}[1+\sqrt{5}\,] = |\frac{\sigma.\Phi}{2\pi.r_n}|$, and from $v = w\,r = 2\pi f\,r$ then , $\mathbf{f_n} = v/2\pi r = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\sigma.\Phi}{2\pi.r_n}$, and $\bar{\mathbf{v}} = \boldsymbol{\sigma}\,.\,\boldsymbol{\Phi}$ ...(**a**) , and ± Spin $\mathbf{S_G} = \bar{\mathbf{B}} = J\,w = \boldsymbol{\pi}^2.\,\mathbf{r}^4\,.\,\mathbf{f_{n=g}}$

i.e. ***Gravitational-Constant*** **Force ≡ 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 a change of 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 $[2^3 = (\oplus \leftrightarrow \ominus)^3]$, 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** $\bar{\mathbf{v}} = \bar{\mathbf{c}}$ is **Acting on cave** , $\mathbf{r} = \mathbf{L_P}$, and finding **Impedance** , $\mathbf{m_g}$, **becomes the Centrifugal-Force** $\mathbf{F_g}$ of **Cave** and is Equal to **Gravity g** $\leftarrow$ as $\mathbf{F_g} = m_g[\frac{c^2}{r}] = J\,w^2\,.\,\frac{c^2}{r}\,.\,g_Z = [\frac{\pi r^4}{2}].[\frac{c}{r}]^2.[\frac{c^2}{r}].\{\,2^3.\ln(3).\pi\sqrt{3}\,\} = \mathbf{4\sqrt{3}\ ln(3)\ .\pi^2\ r\ c^4}$, or **Gravity** $\rightarrow \bar{\mathbf{g}} = \mathbf{4\sqrt{3}\,.\ln(3)\,.\,\pi^2\,L_P\,c^4} \leftarrow$ **Is a Force between The Spinning** $\mathbf{S_{pg}} = \bar{\mathbf{B}}$ and $F_g = \bar{\mathbf{g}} = 4.\sqrt{3}.1{,}0986122886681.\pi^2.1{,}616199.10^{-35}.[2.99819938]^4 = \mathbf{9\ ,\ 8076754}$

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

Velocity-vector $\bar{\mathbf{v}} \equiv \bar{\mathbf{c}} = [\frac{G\,\Phi}{A}]$ and Gravity-vector $\bar{\mathbf{g}} \equiv \mathbf{4\sqrt{3}\ ln(3)\,.\,\pi^2\,L_P\,c^4}$ are both **Constants because { G , Φ , A ≡ b . Impedance }** are all constants .

From Inner-velocity equation $v = wr = (2\pi/T).r = 2\pi.f_1\ r$, wavelength $\lambda = c\,T = c\,/\,f_1$ cave $r = n.[\lambda/2]$, then $r = n.(c/2f_1)$ and $\mathbf{v} = 2\pi.f_1[n.c/2f_1] = \mathbf{n.\pi.c}$ or $\mathbf{v = n.\pi.c}$…(k) Showing that velocities in lobes are , $\mathbf{n.\pi}$,times that of light and for n = 1 then $\mathbf{v = \pi.c}$ more than three times faster of light velocity , and is the **Velocity-Quantization**.

From velocity $v = n.\pi.\mathbf{c}$, is seen that ***light-velocity is the*** **Quantum of Unit-velocity in** $\mathbf{L_P}$.

From above **In-Planck`s-length** velocity $\bar{\mathbf{c}} = w\,r = \frac{\sigma.\Phi}{r_n}r = \sigma\ x\ \Phi = \frac{G.r}{L_P\,\Phi^3}\Phi = \frac{G.r}{\Phi^2 L_P}$ and from relation $\mathbf{G \equiv \sigma\ x\ \Phi^3}$ **then** $\rightarrow [\ \bar{\mathbf{c}} = \frac{G.r}{\Phi^2\,L_P}\ ] \leftarrow$ **which is Light-velocity in** $\mathbf{L_P}$.

For the **Out-Planck`s-length** velocity equation $\bar{v}_m = \mathbf{n}.\bar{\mathbf{c}}\,.\{\,\boxed{\bar{f}_n} + \mathbf{f_n}\,\}$ and from equation $\bar{v}_m = w\,r = \mathbf{n.\pi.c}$, $f = [\frac{\mathbf{n.c}}{\mathbf{2r}}]$ **,** then $\rightarrow \bar{v}_m = \mathbf{n}.\bar{\mathbf{c}}\,.[\,\boxed{\bar{f}_n} + \mathbf{f_n}\,\} \leftarrow$ **which is velocity-Out** $\mathbf{L_P}$.

Photon was proved to be a Material-point in cave , **r** , where its **Inner Storage** is ***the Stationary-Standing-wave*** the Electromagnetic-Wave $[E^2+H^2] = 2(2r).c.\sin 2\varphi$ with **n** Lobes representing the ***Normal mode vibration*** with frequencies $f_n = n\,.\,f_1 = \frac{E}{h} = \frac{n.v}{4r} = \frac{n\sigma}{2\pi r}[1+\sqrt{5}\,]$, and **Outward the Storage** *is the Propagating Electromagnetic- Wave.* $\rightarrow$ $\{[\varepsilon E^2+\mu B^2] = 2.\lambda c.\sin.2\varphi\} \leftarrow$ *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 - 6) , i.e.

Gravity $\bar{\mathbf{g}}$, is The effection of **G** Force , on **c** light-velocity , in the 3-Dimensional Space and Anti-Space , $\mathbf{2^3}$, of Planck-length $\mathbf{L_P = r}$. For more analysis in [90] from relation $\boldsymbol{\sigma}\ \mathbf{x}\ \boldsymbol{\Phi}^3 \equiv \mathbf{G} \rightarrow [1{,}845632.10^{11}].[3{,}6180339887] = \mathbf{6{,}673692.10^{-11}}$ q.e.d.

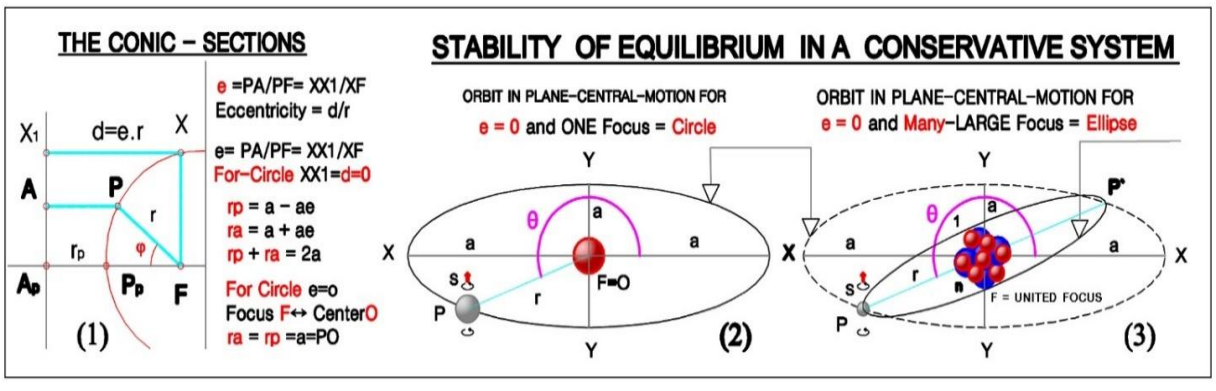


Figure – 8 - : The Two Points Problem Stability of Equilibrium with One or Two Planets. Electron is created through the vibration , $\mathbf{f_n}$, in the ***Energy-Space*** , **g - π** , ***meters*** . Electron cave is the minimum cave of light-velocity **c** to enter and possessing max Energy of $\mathbf{L_p}$ which is **h** .

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

Electron is created through the vibration , $\mathbf{f_n}$, in the ***Energy-Space*** , **g - π** , ***meters*** and follows both Rotational and Linear motion and so the **Constant-Energy k** is the same .

From M-Point ,frequency → $f_N = n\frac{(1+\sqrt{5})\sigma}{4\pi r}$, and→ $\mathbf{w} = 2\pi.f_N = n\frac{(1+\sqrt{5})\sigma}{2r} = \left|\frac{n}{r}\right|.\frac{(1+\sqrt{5})\sigma}{2}$

The **Spring-like central-force** from a fix point , *the Source* , on an attached , *probe* , mass is → $F = -k\,r = -k\,r.\bar{r}$ as equation $\ddot{x} + w^2 x = 0$ …. (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 conditions and which become $x = [\dot{x}(0)/w_n].\sin w_n t + x(0).\cos.w_n t$ ..…..(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 ,

$\frac{w_n}{2\pi} = \mathbf{f_e} = \frac{1}{2\pi}\sqrt{\frac{k}{m}}$, or $4\pi^2 f^2_e . m_e = \mathbf{k} = \boldsymbol{\pi}\,\mathbf{g}$ and → $\mathbf{m_e} = \frac{g}{4\pi f^2_e}$ ....(2)

where **k** = Unit-Spring-Force ≡ [***meter*** of area].[***meter*** of force ≡ ***stress***] ≡ **π g** ...(2a)

From Planck`s equation $\mathbf{f_e = E / h}$ = [- 13,6 x 1,602.10^{-19} = 2,17872.10^{-18} Joule] / [6,626.10^{-34} J.s] = **3, 2881029.10^{15}**/s , where min-energy -13,6 eV is Hydrogen-atom

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

$\mathbf{m_e} = \frac{g}{4\pi f^2_e} = \frac{9{,}8076754}{4.\pi.[3{,}2881.10^{15}]^2}$ = **- 7 , 219016. 10^{-32}** kg …… (2b)

$\mathbf{f_e}$ = **3, 2881029.10^{15}**/ s , and $\mathbf{L_e}$ = **1 , 6819781.10^{-17}** m ..……..(2c)

Equations become from relation → $\mathbf{4\pi . f^2_e . m_e = g}$ ← In Planck`s length .

Electron - Charge , becomes from the ***Periodic excitation*** of the motion of the , ⊕ , constituent to the ⊖ constituent , ***Tack-Geometry*** , **Not** in loop (⊕<<→ ⊖) , **But** through the **One way**- N -Electric-Paths [⊕≪→⊖] , which formulate the **Electric Field-Pattern** , following charge-equation → $\bar{q} \equiv \frac{m_e\, c^2}{2} = \frac{g\, c^2}{8\pi f^2}$. From Gravitation **G** = k_e .**g** , and Voltage $\bar{V} \equiv V_P \equiv \frac{c.\bar{q}}{h}$, Spin = B / π , where Electrons-equation of motion into ⊕<→⊖ is $\ddot{\mathbf{r}} + \mathbf{w^2 r = 0}$ and equation`s Solution → $\mathbf{4\pi.f^2_e.m_e = g}$ ← which 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** → J s = N m s = **Power** ,where from, *Energy* = *Power* x *Time* , issues the Beyond Planck`s length $\mathbf{L_P}$, & Voltage **V** as → $\bar{q} \equiv \frac{K_E}{V_P=1} = \frac{m_e\, c^2}{2} = \frac{g\, c^2}{8\pi f^2.1}$ and $\bar{V} \equiv V_P \equiv \frac{c.Charge}{Total-Energy = h} = \frac{c.\bar{q}}{h}$ .....(3)

Using the two Energy-equations for ***Plane-motion*** → $f_n = \frac{1}{2\pi}\sqrt[2]{\frac{k}{m}}$ and ***Orbital-motion*** $a = \sqrt[3]{\frac{1}{k.f^2}}$, for **Unit**-Energy-Space-frequency k = g , a = π , then → $\mathbf{g.f^2.\pi^3 = 1}$ …..(4)

Frequency $f_n = \sqrt[2]{\frac{1}{g.\pi^3}} = \sqrt[2]{\frac{1}{9{,}808238.\pi^3}}$ =1,8133418.10^{-3} , i.e. **The Unit-Charge-Cave** $\bar{q}$ into Hydrogen cave [a =1,82043047.10^{-12}m].[1,813342.10^{-3}/s] = **3,3010625.10^{-15}** C

From equations Charge and Voltage is the **Self - Growing** Property of frequency $\mathbf{f_n}$ in Material-point , therefore and for Hydrogen-cave is equal to → $\bar{q}$.Φ ,

Because Gravitational Force is equal to → the Geometric-Resultant of light-velocity **c** , acting on **Electron-Unit-Charge** $\bar{\mathbf{q}}$ ← or , $\mathbf{G = c\sqrt{2}\,\bar{q}}$, then Electron-Charge is

$\bar{q}_{\text{Electron}} = \frac{G}{c\sqrt{2}} = \frac{6{,}6736923.10^{-11}}{1{,}41429.2{,}9979346.10^8}$ = 1,574.10^{-19} C .

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

$\bar{q}_{\text{Photon}} = \frac{G}{\sqrt{2}.f} = \frac{G.h}{\sqrt{2}.E} = \frac{[6{,}6736923.10^{-11}].[6{,}62606957.10^{-34}]}{\sqrt{2}.E=1}$ = 3,127 10^{-44} C .

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

The Light velocity vector $\bar{\mathbf{v}} = \bar{\mathbf{c}}$ is Acting on cave , r = L_P , and finding Impedance which is 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** , $\mathbf{r} \neq L_P$, finds The-Impedance $\mathbf{Z_c}$, of the Vector $\bar{\mathbf{c}}$, and becomes the Angular-Momentum-Vector B , of the minimum – Energy Cave in L_P , which is equal to $\mathbf{B \equiv E \equiv r\ Z_c\ \bar{c}}$ …...(1) where , **E** = The Planck`s Total-Energy $\mathbf{E_p = h}$ = 6,62606957.10^{-34} J .s , **r** = The min-Energy Cave of Hydrogen $\mathbf{Z_c}$ = The Total Impedance in Universe , ***of Space + Anti-Space*** , from velocity motion and $\bar{\mathbf{c}}$ is The light-velocity in m/s . Equation (1) becomes → $\mathbf{r\ Z_c\ c = h}$ ← …..(1a)
The **Three Elements** ≡ **Digits** of Material-Geometry are {⊕ , [⊕↔⊖] , ⊖} ≡ [+, 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*** $\mathbf{10^{-10}}$ of their **g-Position** so Antilog $_{10}^{-g/10}$ = 0,10460975
For the three dimensions Total-Impedance Z_c =0,10460975.$(10^{-10})^3$ = 1,046097.10^{-31} and $\mathbf{r_H = \frac{h}{c.Z_c}} = \frac{[6,62606957.10^{-34}]}{2,99798.10^8.1,0460975.10^{-31}}$ = **2,1127839.10^{-11}** m , and is the Hydrogen cave i.e. $L_H = \mathbf{r = \frac{h}{c.Z_c}}$ = 2,1127839.10^{-11} m is the min-cave in Planck`s-cave with max-Energy **h** .
From Kepler third law , Closed-Space-Energy equation of Newton`s Laws of motion the Constant $\mathbf{k} = v^2.r = (w\ r)^2.r = [\frac{2\pi}{T}\mathbf{r}]^2.r = \frac{4\pi^2 r^2}{T^2}.r = \frac{4\pi^2 r^3}{T^2} = 4\pi^2.\frac{r^3}{T^2} = \mathbf{4\pi^2.r^3.f^2_p}$ …...(k)
Because (k) is constant , $r^3.f^2_p$, is also a Constant multiplication of cave , **r** , and the frequency f is also .The **Work ≡ motion** ,which is conserved in cave **r** as the **n** frequencies of $f_N = n\frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{2\bar{B}}{\pi^2 r^4}$, and for the Damping-cave → r(t) = r(t +w) ← as Planck`s scale is with **min-Damping = 1** , and **Unit-Energy-Quantity $\mathbf{W_u}$,** (the critical-energy-unit in the min , r) to be the Unit-Stress-Gravity **g** , as $k = E = \frac{T^2}{a^3} = g = \frac{1}{f^2.a^3}$ and for a = r then $g.r^3.\mathbf{f^2_p} = 1$, 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 f^2 ≡ The **Energy-Part** embodied with stress , g , and
cave a^3 ≡ The **Space-Part** , in the 3-DOF space , as **Period and Frequency ,**
$T^2 = g\ a^3$ = 9, 8076925.[2,1127839.10^{-11}] ^{3} = 9 , 2497939.10^{-32} s , and Period **T** = 3,013473.10^{-16} s , or frequency **f** = 3,3184302.10^{15} /s = 3,3184302.10^{15} H
From equation **E= h f** = 6.62607.10^{-34} .3,3184302.10^{15} = 2,175999.10^{-18} J/(1,6.10^{-19})
= **13 , 599999 eV** 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 and at Periapsis , Energy $E = \frac{GMm}{2a}$ and $\mathbf{e} = \sqrt{1 + 2EL^2/G^2M^2m^3}$,
and for e = 0 , *a circle* , then → $\mathbf{E} = -\frac{G^2M^2m^3}{2L^2}$, i.e. energy is always Negative .
From Hydrogen cave issues $k = E = \frac{T^2}{a^3} = g = [\frac{4\pi^2 a}{GM}]$ therefore , $GM = \frac{4\pi^2 a}{g}$ and from Total-energy $\mathbf{E} = -\frac{GMm}{2a}$, Rotational-Momentum $\mathbf{L} = \sqrt{(1-e^2).GMm^2.a}$, the eccentricity e = 0 , G M m = - 2aE , and then → $L^2 = GMm^2.a = -2aE[a]m = -2a^2.Em$.
i.e. Equation $L^2 = -2a^2.Em$,Denotes that **Angular-Momentum L≡ B in the Circular Orbit Rims is always Negative and equal to $L = -a\sqrt{2Em}$, 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 is formulated the , Hydrogen - cave , by oscillating 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 ≡ 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 , $F_{nucleus} = h.f_n \equiv h.n.\frac{(1+\sqrt{5})\sigma}{4\pi r} \equiv h.[\frac{n.\bar{B}}{\pi^2 r^4}] \equiv h.\frac{n\Phi\sigma}{2\pi r} \equiv h.\frac{n\sigma(1+\sqrt{5})}{4\pi r} \approx 1\text{-}5.10^{10}$ Tesla , and for $F_{photon} = \frac{[\oplus > \rightarrow \leftarrow < \ominus]}{r^2} = \frac{\sigma.\sigma}{r^2} = \left|\frac{\sigma.}{r}\right|^2 \equiv \left|\frac{2B.}{\pi.r^4\Phi}\right|^2$

From r_{min} = 1,07.10^{-7} m and $\mathbf{f^2_p} = \frac{1}{r^3}$ or f_{min}=2,839844.10^{10} H , then Bonding Energy $\mathbf{L} = h.f_N$ = 6.62607.10^{-34} . 2,8398447.10^{10} J / 1,6.10^{-19} = **1, 176063.10^{-6} eV**

E = - L^2 / 2a^2m and for a = r → 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 ≡ [**Proton-Electron-Hook] ≡{Electric-Field–Loops}→ H-Atom-Radius** .

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

It is an Application to Material-Points [⊕↔⊖] , 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 ≡ Angular-velocity-Ellipsoid and then becomes , $J_1 w_1^2 + J_2 w_2^2 + J_3 w_3^2 = 2E$ .....(2)

The Energy-Ellipsoid as $\bar{B}$ ≡ Spin is → $\mathbf{w_1^2 + w_2^2 + w_3^2 = \frac{2E}{J^2} = \frac{4E}{(\pi r^4)^2} = \frac{B^2}{J^2}}$.

Angular-momentum ≡ Spin ≡ $\bar{B}$ ≡ [πσ.r^3 (1+√5) /4] .....(3) In Figure -6- and for the center , K , of ⊕ sphere , issues $\bar{v}_K = [\bar{w}.\bar{r}_K] = [\frac{\sigma[1+\sqrt{5}]}{2r}2r] = \sigma[1+\sqrt{5}]$ and $\bar{B} = \bar{S} =$ $= [\bar{r}.m\bar{v}] = [r.m.\sigma(1+\sqrt{5})]$ and for m = 1 then $\bar{B} = [r\sigma(1+\sqrt{5})]$ .The Interchangable 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 = $(\frac{3\pi r^2}{2})(rw)^2 = (\frac{3\pi r^2}{2})[\sigma(1+\sqrt{5})]^2 = 3\pi r^2\sigma.[3+\sqrt{5}]$ → ***The Ellipsoid of Angular-velocity,$\bar{\mathbf{w}}$,***

and $\mathbf{3B^2/J} = \frac{3(rmv)^2}{J} = \frac{3(rv)^2}{J} = \frac{3r^2.\sigma^2[3+\sqrt{5}]}{4}[\frac{2}{\pi r^4}] = \frac{3.\sigma^2[3+\sqrt{5}]}{2\pi r^2}$ → ***The Momentum-Ellipsoid, $\bar{\mathbf{B}}$*** .

The Angular-momentum In Planck`s-Length ≡ Spin ≡| $\bar{B}$ |≡ π^2 r^4 f ..... (3)

The value of **|B|** = [2 **.** 8,79455.10^{-35}**.1.** 1,6180339] = **2,845976. 10^{-34}** {Kg/m/s}. For Planck-Length $\mathbf{r_P = 1,61623.10^{-35}\sqrt{3}\pi}$ = 8,79455. 10^{-35} m , **velocity** $|\bar{v}| = \frac{\sigma}{r}[1+\sqrt{5}]$ and from (3) then → **Planck-cave-Stress** $\boldsymbol{\sigma = \frac{2\bar{B}}{\pi r^3 \Phi} = 1}$, **Total-Energy 2E = [J w]²** ,

From $|\bar{\mathbf{v}}| = \frac{\sigma}{r}[1+\sqrt{5}]$ = **c** = 3. 10^8 m/s then , $\boldsymbol{\sigma} = \frac{3.10^8}{3,679551.10^{34}}$ = **8,1477332.10^{-27}** Kg/m²

$|\mathbf{w}| = \frac{\sigma}{2r}[1+\sqrt{5}] = (\frac{8,1477332.10^{-27}}{2.8.7945510^{-35}}).3,2360675 = 1,499.10^8$, or **|w| = 1, 5.10^8** rad / sec ,

For σ = 8,147733.10^{-27} Kg/m² and $\bar{\mathbf{B}}$ =5,691952 .10^{-34}J then , Period **T** = $\frac{2\pi}{w} = \frac{2\pi r}{v} =$

$\frac{4\pi r}{\sigma(1+\sqrt{5})} = \frac{4\pi.8.79455.10^{-35}}{\sigma(1+\sqrt{5})} = \frac{3,4151}{\sigma}10^{-34}$ s ,or **Period T=** $[\frac{4,191584}{10^9}]$ s , and frequency f = $\frac{1}{T}$

i.e. **Planck-frequency $\mathbf{f_1}$** = 2,38573294.10^{34} Hz . From above issues ,

a).. The Spin of cave , **r**, is Equal to the Angular-momentum-Vector → **Spin ≡ $|\bar{\mathbf{B}}|$ ≡ r σ Φ** which contains and is the Golden-Radio-frequency Φ as Pressure , σ , in cave r .

b).. In Planck`s-length [for light velocity **c** =3.10^8 m/s] , **velocity** is $|\bar{\mathbf{c}}| = \frac{\sigma}{r}[1+\sqrt{5}]$ m/s and in cave $\mathbf{r_P = 8,794}10^{-35}$ m , the **Pressure** $\boldsymbol{\sigma} = \frac{r.c}{[1+\sqrt{5}]}$ = 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 $\mathbf{f_P = \frac{1}{T} \equiv \frac{\sigma.(1+\sqrt{5})}{4\pi r}}$ =2,3857265.10^7Hz , which is the minimum in Planck-cave .

The extreme for stresses $\boldsymbol{\sigma_{1,2}}$ = $\sigma 1/2 \pm (½).\sqrt{\sigma 1^2 + 4.\sigma 1^2} = \sigma_1.[1 \pm (\sqrt{5})] / 2 = \boldsymbol{\sigma}\Phi$,

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

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

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

W = 2E = B w = J.w² , or **2E = 2π f B** i.e. → **Total - Spin*Frequency ≡ $\bar{\mathbf{B}}$ $\mathbf{f = \frac{E}{\pi}}$** , and

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

$$\mathbf{E = [\ \Phi \frac{\sigma}{4\pi r}\ ]\ .\ \bar{B}\ \equiv\ \frac{|B|^2}{2\,\pi^2 r^4} \equiv \frac{|B|}{2f}} \qquad \ldots\ldots (4) \qquad \text{i.e.}$$

Energy of Particles In-Beyond Planck-cave is dependent on their Spin only , and for the Electron with cave r = a_e = $1{,}6819781.10^{-17}$m , and Principal-stress σ = 1 , then ,

$\mathbf{E} = [\mathbf{\Phi}\frac{\sigma}{4\pi r}].\bar{\mathbf{B}} = 1{,}6180339\ [(\frac{1}{4\pi.1{,}6819781.10^{-17}}].\ 2{,}845976.\ 10^{-34} = \frac{2{,}17872.10^{-18}}{1{,}602.10^{-19}.}$ = **13,6 eV**

All above equations define → **The Ubiquity of Golden-Ratio-Φ** ← in motions in ***Angular-Momentum , Stresses*** , ***Frequency*** or ***Velocity*** in nature ….[64-A-B-C]

1e.. The Dynamic Structure of Atom :

The two elements In Nature are **motion ≡ Energy** and **Space ≡ Displacement** only .
In Mechanics Work ≡ Energy ≡ motion is , 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 [↔] or , *Reciprocating-motion* , and the Revolving motion [⊕↻↺⊖] which defines the **Quality** of Particles. The Rotational motion defines different Period or frequency or Energy .
Atom is a Finite-Energy-Space in where exists motion ≡ Energy ≡ Force **x** Orbit-ray .
Motion occurs from Electrons with Impedance Z_c ≡ mass [m] executing Circular and Elliptical-Plane-Orbits from Nucleus mass [M] obeying ***Kepler`s laws and Newton`s Lagrange laws*** for Mechanics in an Equivalent System. Lagrange equations of motion in any Potential is , $\frac{d}{dt}\ [\ \frac{\partial L_a}{\partial \dot{q}_i}\ ] - \frac{\partial L_a}{q_i} = 0$ *where* , Lagrangian $L_a = (T_K - L)$ ….(1) and

L = The Potential Energy ≡ Pointy motion ≡ Spin
T_K = Kinetic-Energy ≡ Linear or Rotational-motion
$T_K = T(q_1, q_2, \ldots q_N, \dot{q_1}, \dot{q_2}, \ldots \dot{q_N})$
q_i = The generalized coordinates,
$\dot{q_i}$ = The generalized velocities . i =1,2….N
θ = The r → v ↑ angle on Orbit-Nucleus

The Lagrangian of motion is (1) ↓ as

$L_a = \frac{1}{2} m \dot{r}^2 - V(r) = \frac{1}{2} m[\ \dot{r}^2 + \dot{\theta}^2] - V(r)$ ….(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 → $\frac{d}{dt}\ [\ \frac{\partial L_a}{\partial \dot{r}}\ ] - \frac{\partial L_a}{\partial r} = 0$ and $\frac{d}{dt}\ [\ \frac{\partial L_a}{\partial \dot{\theta}}\ ] - \frac{\partial L_a}{\partial \theta} = 0$ …….(2)

Angular momentum vector $\bar{L} = r\ m\ v = m.r.r\ \dot{\theta} = (mr^2.\dot{\theta})$ and $r^2.\dot{\theta} = \frac{L}{m}$ ….. (2a)

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

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

Lagrange`s equation (2) for the r , θ , coordinates becomes ,

$\frac{d}{dt}[\ m.\dot{r}\ ] - [\ m.r.\dot{\theta}^2] + \frac{\partial V}{\partial r} = 0$ and integrating $\mathbf{\frac{1}{2}\,m\dot{r}^2 + \frac{1}{2}\,[\frac{L^2}{m\,r^2}]\ + V(r) = E}$ .....(4)

where **E** is the Energy = the motion in cave Atom , **r** . Solving (4) to velocity then

Velocity $\dot{\mathbf{r}} = \sqrt{\frac{2}{m}[E - V(r) - \frac{L^2}{2m\,r^2}\ ]} \equiv \sqrt{\frac{2}{m}[E - \{\frac{k}{r} + \frac{L^2}{2m\,r^2}\}]}$ ……..(5) **i.e.**

Electron`s Velocity $\bar{v}_e = \dot{\mathbf{r}}$, 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 .**

2e.. The Atoms Physical Properties :

1.. Total Energy $E = T_K + L \equiv$ The constant of Integral.
2.. Spin ≡ Torsional momentum ≡ L ≡ B = constant .
3.. Potential Energy $U = V(r) + \frac{L^2}{m\,r^2} = -\frac{k}{r} + \frac{L^2}{m\,r^2}$, where k = a constant , and then ,

a… As $\mathbf{r \to 0}$, then $U = -\frac{k}{r} + \frac{L^2}{m\,r^2} = \frac{1}{r^2}\ [\frac{L^2}{2\,m} - k\,r\ ] \equiv \quad \infty \to$ Strong-Forces

b… As $\mathbf{r == \infty}$, then $U = -\frac{k}{r} + \frac{L^2}{m\,r^2} = \frac{1}{\infty^2}\ [\frac{L^2}{2\,m} - k\,r\ ] \equiv \quad 0 \to$ PNS-Field

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

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

e… As $\mathbf{r} \rightarrow \frac{L^2}{2\,k\,m}$, then $U = \frac{4k^2m^2}{L^4}\left[\frac{L^2}{2\,m} - \frac{L^2}{2\,m}\right] = 0 \rightarrow$ 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 becomes Negative (< 0) as $r = \infty$, for any L and r .

Integrating (3) then , $A = T\,L\,/2m = 2\,a\,b$, where **T** the Period of Orbital rotation and $b^2 = a^2-(ae)^2$ and from Kepler laws $\frac{T^2}{a^2} = \frac{4\pi^2 m}{2E} = \frac{4\pi^2}{2E/m} = \frac{4\pi^2\,a}{GM}$ or $T^2 = \frac{4\pi^2\,a^3}{GM}$ = constant ..(6)

Energy $\mathbf{E = \frac{1}{2}m\dot{r}^2 + \frac{L^2}{2\,m\,r^2} - \frac{GmM}{r}}$, $\mathbf{L = m.r^2.\dot{\theta}}$ ….(7) and 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 $\dot{\mathbf{r}}$, of the First-term is zero , and this happens at the turning points then $\mathbf{U} = \frac{L^2}{2\,m\,r^2} - \frac{GmM}{r} = 0$, and $U' = \frac{\partial U}{\partial r} = -\frac{k}{r} = f + \frac{L^2}{2\,m\,r^3} = 0$,

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

$\frac{\partial f}{\partial r} < \frac{3\,L^2}{m\,r^4}$ becomes according to position r_o , $\frac{\partial f}{\partial r_o} < -\frac{3\,f(r_o)}{r_o}$ ……(8a)

2e.. The Boundedness of Orbits :

The general solution of (5) is $\frac{1}{r} = \frac{Gm^2M}{L^2} + c_1.\cos\vartheta$…(5a) ,where c_1 is a constant and from Kepler`s relation $r = \frac{a(1-e^2)}{1+e\cos\vartheta}$ inversing then $\frac{1}{r} = \frac{1}{a(1-e^2)} + \frac{e\cos\vartheta}{a(1-e^2)}$ 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

Semimajor axis $\mathbf{a} = \frac{L^2}{G\,m^2M(1-e^2)} \equiv \frac{GM\,m}{2\,E}$ …..(9a)

Total-Eergy $\mathbf{E} = \frac{G^2m^3M^2}{2\,L^2}(e^2\text{-}1) \equiv \frac{GM\,m}{2\,a}$ ……(9b)

Eccentricity $\mathbf{e} = \sqrt{1 + \frac{2EL^2}{G^2M^2m^3}}$ …..(9c)

Spin $\rightarrow \bar{B} \equiv \mathbf{L} = \sqrt{(1-e^2).GMm^2.a}$ …,.. (9d)

Energy in Orbit. $\mathbf{E} = -\frac{GM\,m}{2\,r_p}(e-1)$ and $\mathbf{L} = \sqrt{(1+e).GMm^2.r_p}$ .....(10)

From Orbit-Geometry is $g\,.f^2.a^3 = 1$, $g\,.f^2.\pi^3 = 1$, and $E = h\,f$ .....(11)

Using the known equations for Spin then Spin = $\bar{B} = (\pi^2r^4).f_n$ = The Energy in **n** wave-node loop where $f_n = [\,n\frac{\sigma(1+\sqrt{5})}{4\pi r}\,] \equiv \frac{(1+\sqrt{5}\,]).\sigma}{4\pi r} = \frac{\Phi.\sigma}{2\pi r} = \frac{E}{h}$ ….....(12)

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

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

3e.. The Euler-Analysis of Motion in Orbits : Figure -8- 1,2,3 :

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

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

J_1 , J_2 , J_3 → Are the Moments of Inertia of Ellipsoid related to Principal axis .

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

$\bar{\imath}$, $\bar{\jmath}$, $\bar{k}$ → The Unit constant-vector of the moving Body-System . { the Origin}.

$\bar{\imath}`$, $\bar{\jmath}`$, $\bar{k}`$ → The Unit constant-vectors of Body-System .

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

φ , θ , ψ → The Three axial angles of vectors $\bar{\imath}`$, $\bar{s}_o$ - $\bar{\imath}$ ,$\bar{s}_o$ - $\bar{k}$ $\bar{k}`$

Q → The weight of the Rigid-Body = m g .

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

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

Energy Relations :

$\bar{B} = J_1w_1\bar{\imath} + J_2w_2\bar{\jmath} + J_3w_3\bar{k}$ …..…….. (16)

$B^2 = J_1^2w_1^2 + J_2^2w_2^2 + J_3^2w_3^2$ ……..…….. (16a)

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

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

i.e. → 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 ⊥ E] Vector . [70]

4e.. : 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 ,

$\mathbf{G} \equiv g.k_E \equiv g\,.[g_L\,k_L] \equiv [\frac{T^2_P}{a^3}].[g_L\,k_L] \equiv 9{,}8078925 * 6{,}8116.10^{-12} \equiv 6{,}68056.10^{-11}\ \frac{m^3}{Ns^2}$

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 $\bar{B}$ and rotates according to equation $\frac{dB}{dt} = [\bar{u}\bar{B}] = uB.[\bar{k}\bar{k}`]$ in Gravitational Potential $U_g = [\,mg].s.\cos\theta = -\,sQ\,.[\bar{k}\bar{k}`]$,so the change of $\bar{B}$ is → $\frac{dB}{dt} = u = \frac{s.Q}{B} = \frac{s.Q}{J_3.w_3.}$ and from 1-degree equation of motion , u , $\ddot{\mathbf{u}} + \mathbf{w}^2\,\mathbf{u} = \mathbf{0}$,then

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

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

For Material-Point, the chains of Spins due to Periodic excitation [<↔**]** is created in ***Orbit a Magnetic field*** due to LRC-circuit and which is tuning to the critical Quantum critical-State $\mathbf{g_G}$. **The Light velocity vector** $\bar{v} = \bar{c}$, by **Acting on cave** , $\mathbf{r} = \mathbf{L_P}$, finds the **Impedance** m_g , **Becomes the Centrifugal-Force** $\mathbf{F_g}$ of **Cave** Equal to **Gravity g** . The **chains of Spins** for the , ONE-WAY Pointy vibrating , is the Resonance Frequency $f_R = \frac{(1+\sqrt{5}\,]).\sigma}{4\pi r}$ of c and $\bar{B}$ of The-Stationary-Photon-cave , where $\bar{B} \equiv \bar{S} \equiv$ Spin .

The Moving Electron in Orbit of charge $\bar{q} \equiv \ominus$ with the **Orbit-Velocity-Vector** $\bar{v}$ **is**

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

Since **Work** is **Produced** during motion , The **Conservation exist in Orbit** [p↔ e] , so the ***Orbit occupies Energy as frequency quite differing that of those of Energy-levels .***

Since frequency $\mathbf{f_N} = \mathbf{f_R} = \mathbf{2,\,8398447.10^{10}}\ s^{-1}$ {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 $\mathbf{E = h.f_N} = 6.62607.10^{-34} . 2{,}8398447.10^{10} = 18{,}817009.\,10^{-24}$ J / $(1{,}6.\,10^{-19}) = 1{,}174463\,.10^{-4}$ eV , is conserved as **Thermal-Energy** $\mathbf{E_T}$ in kilo Cal and is $E_T = 18{,}817009.\,10^{-24}$ J / [(4,19. 10^3) = kcal] = 4,49093. 10^{-27} kcal .This happens because of the closed Energy-Orbit-Rims , **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 and which is $\mathbf{E_P = 20}$ kcal = 20. (4,19. 10^3) = $8{,}3777.10^4$ J the ratio , [E_T / E_P] = 4,49093 . 10^{-27}/20 = $2{,}24546\,.10^{-28}$, is a Quantity **Not-detected** .

Hydrogen caves created in Sun **1 Million-years-ago** =10^6.365.24.3600 = $3{,}1538.10^{13}$ sec , is accumulated Thermal-Energy of E_T =$3{,}1538.10^{13}$.4,49093.10`$^{-27}$=$\mathbf{1{,}41625.10^{-13}}$**kcal** , i.e. The Stationary Hydrogen-wave–cave Thermal-Energy needs 1-Quadrillion years to be 1-kcal.

For Half-frequency f_R / 2 = $1{,}4199223.10^{10}\ s^{-1}$, the Kinetic Energy is Zero and Potential-Energy is , **U = E = h f =** 6,62606957.10^{-34} . $1{,}4199223.10^{10}$ = $9{,}4.10^{-24}$ J = $5{,}8722.10^{10}$ eV , which agree with Bohr-Magneton .

The Produced-Work in Orbit as Frequency $\mathbf{f_N} = \frac{sQ}{2\pi.J_3 w}$ **= 2 ,8398447. 10^{10}** s^{-1} is Constant and is **Conserved** . Because of the **Magnetic - field created On-Orbit** , and **Applied At - Nucleus with the same Effect then , exists LARMOR - Equation as** $\mathbf{w_0 = \gamma.\,\beta_0\,/\,2\pi}$ **,** and for Hydrogen at 1,5 T Magnet , $\boldsymbol{\gamma}$ **= 2,675.** 10^8 / sT , $\boldsymbol{\beta_0}$ = 1,5 T

then **w** = 63,864 MHz = 63,864.10^8 Hz and frequency $\mathbf{f_N = 2\pi.w = 4\ ,012575.\ 10^{10}\ s^{-1}}$.

Remarks :

1.. Since the frequency created from Electron-Nutation is the Basic , ***first*** , Orbit of Atoms , therefore allows a **Resonance-frequency** between all **Atoms** , **Molecules** and others .

2.. Since Electron is continually-oscillating with the Nutation-frequency $\mathbf{f_N}$ **, so** Produces an oscillating magnetic field which in turn is the source of an oscillating field , which implies the **Regeneration each other** , i.e. a **Propagating Electromagnetic-Wave** where **E = B c** This is a **Way of Information** and **Storage in Nature .**

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 = 2μ.B .

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 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 .

5e.. 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 area **A** = πr^2.

2,, **Angular-momentum-Vector** becomes from the ***Eternal-Rotation*** of the ⊖ constituent around the ⊕ ***constituent in a cave*** of ***radius , r ,*** and area **A** = πr^2.

i.e. The Phenomenon , The Same-Vector , measured Electrically and Mechanically .

The magnetic moment generated by 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 ,

Magnetic – moment . $\bar{\mu} = I . A$ …..…..(a)

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

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

From (a) , (b) the Angular – velocity - Ellipsoid $\bar{\mathbf{w}}$, is the analogous to circular current , I , and Angular - Momentum-Ellipsoid $\bar{\mathbf{B}}$, is the analogous to the Torque , $\bar{\boldsymbol{\mu}}$, on this circular loop so $\bar{\boldsymbol{\mu}}$ = I . A $= \frac{\text{Energy=Motion}}{\text{Unit−Time}} = \frac{\text{I.A.s}}{s} = \bar{\mathbf{B}} = \frac{2L}{\bar{w}} = \frac{2L}{2\pi f} = |\frac{L}{\pi}|.|\frac{1}{f}| = \frac{4r.(hf)}{(1+\sqrt{5}\ ).\sigma} = [\frac{h}{2\pi}]$ = **SPIN** …(c)

i.e. The Magnetic – moment $\bar{\boldsymbol{\mu}}$ of Material – point = $[\frac{\mathbf{h}}{\mathbf{2\pi}}] \equiv$ SPIN , and also equal to

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

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

or $F_{loop} = F_{dipole} + \bar{\mu}\ .\ [\ \nabla x\bar{P}\ ]$.

The Potential energy associated with the magnetic moment is $U = -\bar{\mu}\ .\ \bar{P}$ so that the difference in Energy Aligned and Anti-aligned is $\Delta U = 2\ \bar{\mu}\ .\ \bar{P}$. From Physics , The intrinsic magnetic moment , $\bar{\boldsymbol{\mu}} = \frac{g_s.q}{2m}$. S , where $\mathbf{g_s}$= a dimension-less quantity q = the charge , m = the mass , S = the Spin of particles and from (c) , L = B w / 2 , and since B = S then ,

$\bar{\boldsymbol{\mu}}_{\,intrinsic} = \frac{4r.L}{(1+\sqrt{5}\ ).\sigma} = \frac{2wr.B}{(1+\sqrt{5}\ ).\sigma}$ and $\bar{\boldsymbol{\mu}} = \frac{g_s.q}{2m}.S$, or $g_s = 2(\frac{m.\bar{\mu}}{q.\mathbf{S}})$,and because charge **q** is equivalent to Angular-velocity-Vector , $\bar{w}$, then $\mathbf{g_s} = 2\ .\ (\ \frac{m.\ \bar{\mu}}{\bar{w}.\ S}\ ) = 2\ .\ [\frac{m\ .(\bar{\mu}=2L`)}{\bar{w}\ .(S=2L)}]$ …(d)

i.e. Dimensionless quantity $\mathbf{g_s}$, is related to → mass **m** , charge **q** , Spin **S** , and Intrinsic magnetic moment $\bar{\boldsymbol{\mu}}$, or → is analogous to mass **m** , Angular velocity **w** , and Glue-bond **σ**.

This Intrinsic Angular-Velocity $\bar{\mathbf{w}}$, of the Material-point allows Spin **S** , to be quantized as to Straightly in Great-circles , [S = ± 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 = $\frac{\sigma}{2r}[\ 1+\sqrt{5}\ ].r = \frac{\sigma}{2}\ [1+\sqrt{5}\ ] = \boldsymbol{\sigma\ \Phi}$, 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 opposite

direction and has nothing to do with Spinors . [35-36]
Space is a Quaternion , having discrete quantized Energy boundaries those of the two , (⊕) , (⊖) , constituents eternally rolling on Great or Small circles and accordingly , Clockwise or
Anticlockwise Originating the ± 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** , ± **σ** , 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 Magnetic moment , or $\bar{\mathbf{q}} \equiv \bar{\boldsymbol{\mu}}$, and current equivalent to angular velocity , or $\mathbf{I} \equiv \mathbf{w}$. **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** ,
$a_a = \frac{\bar{B}x\bar{w}}{J}$, where
$J = \frac{\pi r4}{2}$ = The Polar moment of inertia and from Newton equation $2E = m.a_a$ then , $\mathbf{m} = \frac{2E}{a_a} = [\frac{\bar{B}.\bar{w}}{\bar{B}x\bar{w}}]$. **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 , $\mathbf{m} = \frac{2E}{a_a} = [\frac{\bar{B}.\bar{w}}{\bar{B}x\bar{w}}]$ **. J** ≡ ***a number measuring Energy-quantities in caves*** .
For an inclination of 45° then the Dot Product of $\bar{B}.\bar{w}$ is $\rightarrow |\bar{B}|.|\bar{w}| = |\bar{B}|.|\bar{w}|.\cos 45°$
and the Cross Product of $\bar{B}x\bar{w}$ is $\rightarrow |\bar{B}|x|\bar{w}| = |\bar{B}|x|\bar{w}|.\sin 45°$ equal to Dot Product , and
In Planck`s – length - cave $r = 4{,}453.\ 10^{-35}$ then mass becomes →

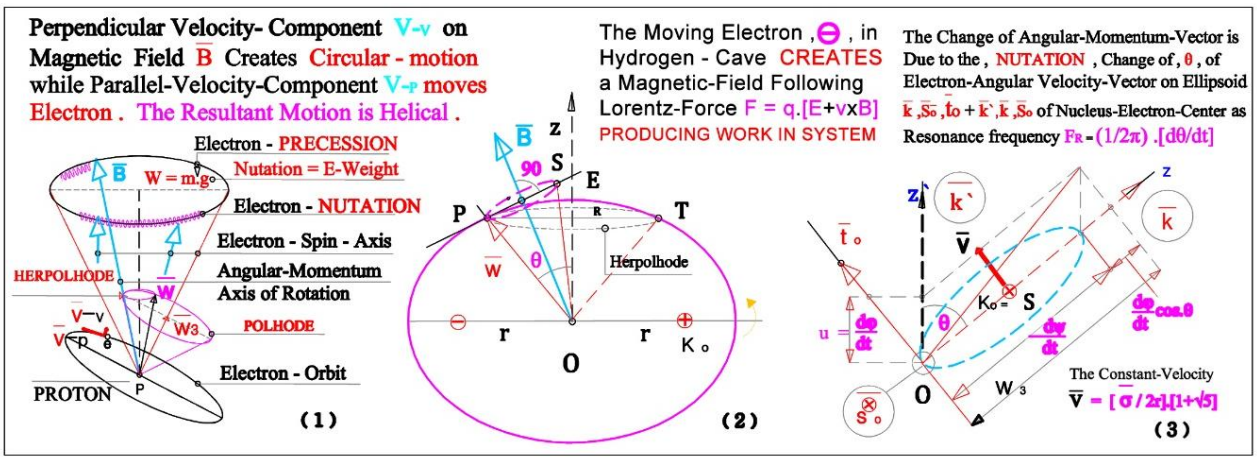
$$m = \frac{1}{1}.J = \frac{\pi r4}{2} = 617{,}63.10^{-140} = 6{,}1763.\ 10^{-138}\ \text{Kg , and}$$

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 .
From equation $\bar{B} = r\ m\ v = m\ r\ wr = m.w.r^2$, ***mass*** $\mathbf{m} = \frac{\bar{B}}{wr^2} = \frac{2.B}{\sigma.r(1+\sqrt{5})} = [\frac{1}{2\pi f}]\ \frac{\bar{B}}{r} = \frac{1}{w}\ \frac{\bar{B}}{r}$
$= \frac{2\bar{E}}{r}$ or $\rightarrow m = \frac{2E}{r}$, and $E = \frac{\mathbf{B}}{2c.}$ ...[m] ***denoting the Unification of Energy Mass and Cave*** .
[m] is **The mass of Material-Point related to Any cave** , **r** , and ± **σ** its Principal Stresses.
All Energy-levels follow the Space-Grainy-relation $f^2{}_n\, a^3 = k =$ **Quantum-of motion**.
Applying above to Under Planck`s length (that what prior called Virtual Particle or Fields of Antiparticle pairs) ,{ The Spin ≡ the Angular-Momentum-Vector $\bar{\mathbf{B}}$ **,** in the Self rotating Material point [$+s^2 \leftrightarrow -s^2$] } → explains the **Why Galaxies** , and the clusters of Galaxies
remain stable . In Caves of (⊕≡ $+s^2$) , (⊖≡ $-s^2$) ,Emerge-Spin as the Automobile - Force is **Vacuum-Energy** which was Prior analyzed . The Gravity-length-cave **r** $=3{,}969.10^{-62}$
and mass becomes → $m = \frac{1}{1}.J = \frac{\pi r4}{2} = 389{,}80218.10^{-248} = 3{,}898.10^{-246}$ Kg .

6e.. The Atoms Precession :

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 ⊥ OB , where Polhode is PS ⊥ OP , perpendicular to Ellipsoid .

In (**3**) **The Change of Angular Momentum vector** $\bar{B}$ **, 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 = constant then $\frac{d\varphi}{dt} = \frac{d\psi}{dt}$ = constant and angular velocity $w = \bar{k}`\frac{d\varphi}{dt} + \bar{k}\frac{d\psi}{dt}$ in the $\bar{k}\ \bar{k}`$ Plane.

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

$$J_1.\mathbf{u}^2.\cos\theta - J_3.w_3.\mathbf{u} + s\,Q = 0 \qquad \text{..... (1)} \quad \text{where } \mathbf{u} = \frac{d\varphi}{dt} = \frac{dB}{dt}$$

with solution $\mathbf{u} = \frac{J_3.w_3}{2J_{1.}\cos\theta} \pm \sqrt{\left[\frac{J_3.w_3}{2J_{1.}\cos\theta}\right]^2 - \frac{sQ}{J_{1..}\cos\theta}}$ …(2) Displacement , **u** ,

is called → **The Regular Precession of the Rigid-Body** ← stores

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

The change of Angular-momentum is $d\bar{B} = M.dt = [\ \bar{s}_o.Q\ ]dt = s\,Q.[\bar{k}\ \bar{k}`]dt$ ……(3)

where Kinetic energy during a displacement 2s , is not changing , while Angular-velocity vector $\bar{w}$, is placed around $\bar{B}$,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 $\bar{\mathbf{B}}$, $\bar{\mathbf{w}}$, are very closed each other and to symmetric axis $\bar{k}$, **Polhode** are narrow closed loop-curves on Poisson-Plane around $\bar{B}$ vector .

The Angular-momentum-vector $\bar{B}$ rotates according to equation $\frac{dB}{dt} = [\bar{u}\bar{B}] = uB.[\bar{k}\bar{k}`]$ in Gravitational Potential $U_g = [\ mg].s.\cos\theta = -\,sQ\ .\ [\bar{k}\bar{k}`]$, so the change of $\bar{B}$ is →

$\frac{dB}{dt} = \mathbf{u} = \frac{sQ}{B} = \frac{sQ}{J_3.w_3.}$ and from 1- degree equation of motion , $\ddot{\mathbf{u}} + \mathbf{w}^2\,\mathbf{u} = \mathbf{0}$, then

Period of Nutation $T = \frac{2\pi}{u} = \frac{2\pi.J_3 w}{sQ}$, and ***Frequency*** $\mathbf{f_N} = \frac{\mathbf{sQ}}{\mathbf{2\pi.J_3 w}}$ …….. (4)

With 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

$$E_N = \frac{J_1}{2}[\dot{\vartheta}^2 + \dot{\varphi}^2\sin^2\theta] + \frac{J_3}{2}[\dot{\psi} + \dot{\varphi}\cos\theta\ ]^2 \text{ ...(5)}$$

An Example :

For Electron radius $\mathbf{s} = r_e = 5,82.10^{-16}$ m ,

Weight of Electron $Q = m_e\,g = 9,11.10^{-31}.\,9,808 = 8,93.10^{-30}$ Kg ,

Moment of Inertia-Disk $J_e = J_3 = [\pi\,a^4/2] = \pi/2[5,8.10^{-16}\ ]^4 = 1,777591.10^{-61}$ m^4,

Angular velocity $w_e = \frac{v}{r_N} = \frac{c}{1836} = \frac{3.10^8}{1836} = 1,633.10^5$ m/s because of masses analogy

The-Electron-Nutation-frequency $\mathbf{f_N} = \frac{s\,Q}{2\pi.J_3 w} = \frac{5,82.10^{-16}.\,8,93.10^{-30}}{2\pi.1,777591.10^{-61}.1,633.10^5} =$

$$\mathbf{f_N} = \mathbf{f_R} = \mathbf{2,8398447.10^{10}}\ s^{-1} \text{ .....(6)}$$

From equation (5) is seen , The **moving Electron** [⊖ charge] creates a Magnetic-field which **Changes** from Total-Kinetic-energy $E = T_K + L$, where $L = S$ = Spin .

What this means ? → **Work *is continually created as Resonance-Frequency*** $\mathbf{f_R} = \mathbf{f_N}$

Since in Universe exist only **Motion ,** and Work ≡ **Energy** ≡ **Force** x **Displacement** , therefore the continually-Moving Electron **Carries this** → [Motion-Box] . How ???

To exist Work ≡ 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 confined motion***] . In Photon , [Motion-Box] , are the n , frequencies .

The moving Electron-vector is $\bar{v}_e = \bar{v}_{e\uparrow} + \bar{v}_{e\rightarrow}$, which is composed of Two-velocity components ,the one is the Perpendicular ↑ and the other is the Parallel →**to Motion Box** where the **First CARRIES Motion Into the** [**Motion-Box**] , and the **Second PUSHES** the **Motion-Box** , Figure -10- as

1.. The [Motion Box] which carries ,**This Motion v** ≡ $\dot{\mathbf{r}}$, are **The Magnetic-field-lines**

which are circles in field , filled with motion ≡ transportation ≡ Spinning ≡ tension . The velocity-component , $\bar{v}_{e\uparrow}$, being Perpendicular to the Magnetic - lines creates Energy-Circles and thus , Motion ≡ Work ≡ Energy , is **Carried in this Magnet-Box** .

2.. **The Pushing velocity-Force** on this [**Magnet-Box**] ≡ **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 $\bar{v}_{e\rightarrow}$. The Resulting Helical motion is Energy Propagated . The difference between the Potential-Energy of the Orbit and that of Electron Nutation in 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*** , $\mathbf{f}_N$,either by storing in it Electrical-Energy or by Charging its Capacitor . The Cyclotron frequency $f_N = \frac{sQ}{2\pi.J_3 w} = \frac{qB}{2\pi.m}$ is free , i.e. *independent* of Velocities .In Fig-10- is shown the **Propagating Electromagnetic-Wave**.

The [Magnetic-Fields]≡[Energy-Baskets] is the Way for Energy-Propagation as , Strength-field $\bar{\mathbf{B}}_F = [\frac{2\pi.m_T}{q_T}].f \equiv \bar{B} = \frac{\pi r^3 \Phi.\sigma}{4} \rightarrow$ **Wave ≡** $\{[\varepsilon E^2 + \mu B^2] = 2.\lambda c.$ **sin** $\left[\frac{2\pi c}{\lambda}\right]\}$, $\bar{\mathbf{w}} = 2\pi f = \frac{S_p}{m}$, issuing that Tangent of Ellipsoid → $\bar{B} \perp \bar{\mathbf{w}}$ Vector ← and Tangent of Ellipsoid → $\bar{\mathbf{w}} \perp \bar{B}$ Vector .It is a relation between Angular and Momentum Ellipsoid.

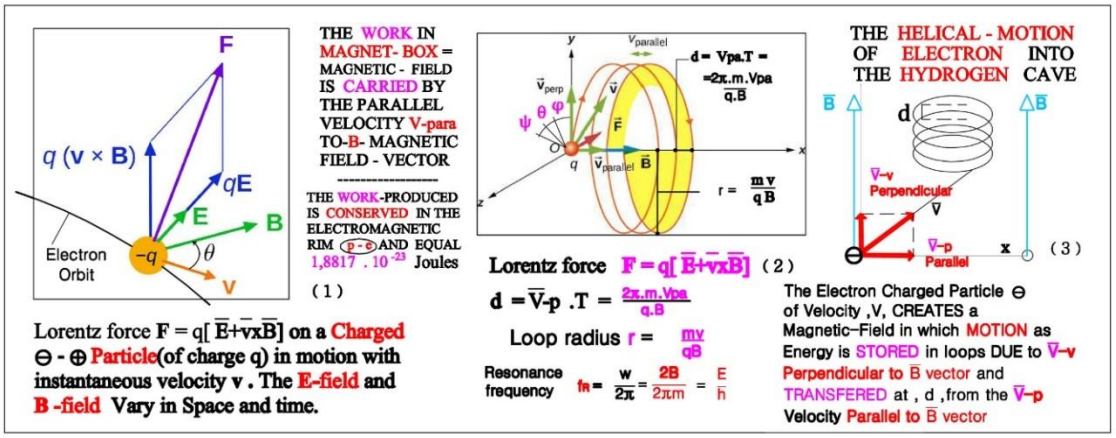


Figure -10- : The How moving-Electrons create Electromagnetic-Wave and Propagate.

In (1) , The Moving Electron of charge $\bar{\mathbf{q}} \equiv \ominus$ mass **m** , with the **Orbit-Velocity-Vector** $\bar{\mathbf{v}}$ **,** $\bar{\mathbf{v}} = \sqrt{\frac{2}{m}[E - \{\frac{k}{r} + \frac{L^2}{2m\,r^2}\}]}$, **Creates IN Orbit** , **r** , the Varying Perpendicular Magnetic-Field , $\bar{\mathbf{B}}$, which in time-turn **Creates** an Electric-field , $\bar{\mathbf{E}}$, which is Perpendicular to $\bar{\mathbf{B}}$, with resultant force **F** , acting on Electron . Velocity $\bar{\mathbf{v}}$ is composed of $\mathbf{V_p}$, Perpendicular to the Magnetic-circles **O⊥B** , and $\mathbf{V_v}$, Parallel to the Magnetic-field-Vector B tending to , L ≡ S ≡ Spin . The resulting motion of Electron is the Helical-motion .

In (2) , The changing Electron-velocity-Vector , $\bar{\mathbf{v}} = \sqrt{\frac{2}{m}[E - \{\frac{k}{r} + \frac{L^2}{2m\,r^2}\}]}$, **Creates** the Perpendicular Magnetic-Field $\bar{\mathbf{B}}$,which Magnetic-lines are the Energy circles **O** in **B** , *Due to the velocity-constituent* $\mathbf{V_p}$, which is Perpendicular to Magnetic lines **O** . The velocity - constituent $\mathbf{V_v}$ 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 $\bar{\mathbf{B}}$ **, Property** answers the **Zeeman effect** .

In (3) , The Moving Electron of charge $\bar{\mathbf{q}} \equiv \ominus$, with the **Orbit-Velocity-Vector** , $\bar{\mathbf{v}}$ **,** as $\bar{\mathbf{v}} = \sqrt{\frac{2}{m}[E - \{\frac{k}{r} + \frac{L^2}{2m\,r^2}\}]}$, is forming angle < θ with $\bar{\mathbf{B}}$ Vector **, Creates IN ORBIT , r** , the Perpendicular Magnetic-Field $\bar{\mathbf{B}}$, which Magnetic-lines are the Energy circles **O** in **B** , *Due to the velocity-constituent* $\mathbf{V_p}$, Perpendicular to Magnetic-circles **O** . The velocity - constituent $\mathbf{V_v}$ is Perpendicular to the , **Plane of Magnetic - Circles - O** , and Pushes the O-Plane along a straight line .i.e. **Magnetic-Field is the Store of Energy .** The continuous change of direction of the Electron **Orbit-Velocity-Vector** $\bar{\mathbf{v}}$ **,** related to

L ≡ S ≡ 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 is **Produced-Work** , which is **Conserved in Orbit** so , Orbit occupies Energy as frequency differing that of Energy-levels . i.e. **Energy ≡ 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 $f_N = f_R = 2,8398447.10^{10}\ s^{-1}$ **exists in all Atoms** , it is The **Resonance - frequency** between All **Atoms and Molecules** in this Cosmos .

For Half-frequency $f_R / 2 = 1,4199223.10^{10}\ s^{-1}$, then Kinetic Energy is zero and Potential-Energy is , $\mathbf{U = E = h\,f} = 6,62606957.10^{-34}.1,4199223.10^{10} = 9,4.10^{-24}J$ $= 5,8722.10^{10}$ eV , which agrees with Bohr-Magneton .

Because the Magnetic-field is created **On-Orbit and Applied At-Nucleus with the same Effect then , exists LARMOR - Equation as ,** $\mathbf{w_0 = \gamma.\beta_0 / 2\pi}$, and for the Hydrogen at 1,5 T Magnet , $\gamma = 2,675.10^8$ /sT , $\beta_0 = 1,5$ T , then $w_0 = 63,864$ MHz $= 63,864.10^9$ Hz , frequency $\mathbf{f_N = w/2\pi = 1,016457.10^{10}\ s^{-1}}$ or is , **The Communication-Tool** , ***The Identity-Card*** **between all Atoms relations**.

From Orbit-equation , $\bar{v} = \sqrt{\frac{2}{m}[E - \{\frac{k}{r} + \frac{S^2}{2m\,r^2}\}]}$ and for v = 0 then $E = \{\frac{k}{r} + \frac{S^2}{2m\,r^2}\}$ and for $r_p = L^2 / [GM\ m^2] = S^2/m^2GM$ then $\mathbf{E} = \left\{\frac{k.GM.m^2}{L^2} + \frac{S^2}{2m\,r^2}\right\} = [\frac{k.GM.m^2}{S^2} + \frac{m.[GMm]^2}{2.S^2}]$, and Energy $\mathbf{E} = [\frac{GM.m^2}{2\,S^2}].[2k+GMm] \equiv \frac{k_O}{2\,S^2} \equiv$ **Constant** and **Halve-Spin-Inverse-Squared** ,

The Total-Energy for moving-caves is $E_K = \frac{1}{a_R{}^2}[\frac{4\pi^2}{c^2} + \frac{a_{H.c.S_T}}{2}]$ in Joules (1J = 1N.1m)

i.e. Energy ≡ motion , And is transported in Caves as their **Spin-Position** , **S** , which thus , defines The Identity of Orbits in all Atoms and Molecules .

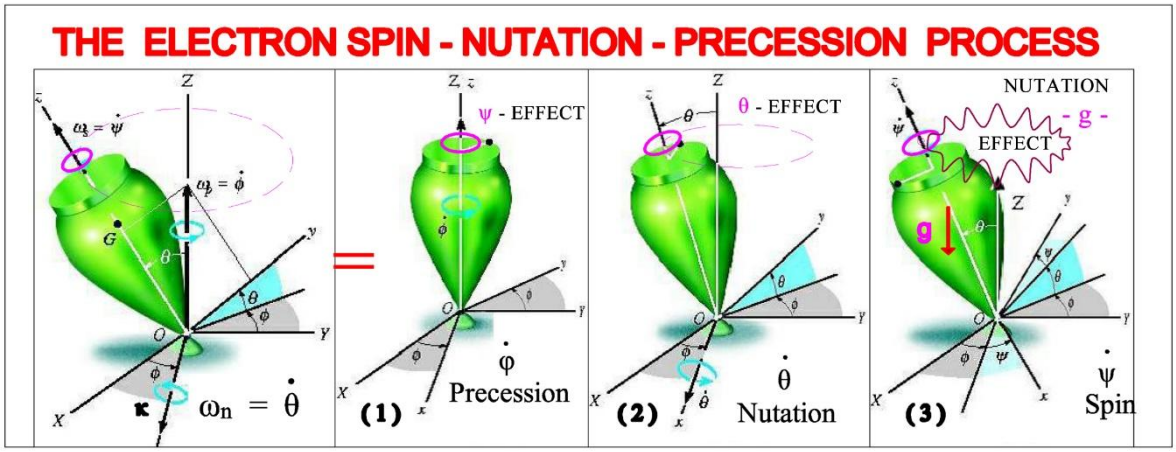


Figure - 11 - The Effect of Gravity ,**g**, on Electron-mass **Originates Electron-Nutation** θ , in **Electron-Precession** , φ , and changes **Electron-Spin-Direction** , ψ . The **Produced-Energy** is stored in Magnetic field $\bar{B}_p = 2\pi.m_p.f_r / \bar{q}_p$

The Data In A - Cave -Site :

a).. **Spin** is a **Couple of Forces** [+ F , - F] following the Vectors Rules . Figure-10,12-

b).. **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*** .

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 , dψ .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 , as [The , m_N , m_O ***Current-loop***] ≡ The **Energy-Proton-Cantilever-Vector** or the **Hydrogen-Bracket N-O .**

d).. 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*** $\mathbf{f_R}$ ***is added in*** N-O ***loop or in*** → [The m_N , m_O ***Current-Potential-loop*** E = U(x)] as before .

e).. **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 $m_N , m_{o \equiv e}$ of **Current-loop** which is continually altered because of the **Polhode curve** Fig- 9 **.** Since the Total Angular Momentum $M_T = M_N + M_O$ where $M_T = L = S = I \times w$, **and** is Swinging on the **Precession-circle** and **w-Nib on Polhode curve** , **therefore the Resultant** M_T , Resonates with the Quantum frequency $\mathbf{f_R}$ of the cave to form with ± 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 → [m_N , m_O ***Current-Potential-loop*** U(x)] ≡ **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 ⊥ 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 → **the Nucleus-Orbit Vector-Bracket ←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 ≡** ⊕ Proton↔⊖ Electron which **ORIGINATES The-Constant-Resonance-frequency** $\mathbf{f_R}$ 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** $\mathbf{f_R}$ **,** IN ORBIT-RIM **N-O .** This Orbit-Rim which is [**The** , m_N , m_e ,**Current-loop**] , continually increases its Energy and so produces a Signal , $\mathbf{f_R}$, in The Hydrogen-Atom , i.e. **Gravity g , acting On The Varying-Velocity** ẋ of the **Orbiting-Electron Creates** , **The Nutation of Electron , which Work is Conserved** as **The-Electron-Magnetic-Field** and **magnetic moment** , $\bar{\mu}$, **i**n a time **T ,** and as a **Resonance-frequency** $\mathbf{f_R}$. When velocity ẋ = 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 .

Energy equation is → $E_{loop} = E_{dipole} + \bar{\mu} . [\nabla x \bar{P}] \equiv E_{dipole} + \bar{B} . [\nabla x \bar{P}]$ …(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**.

The Produced-Work is The-Frequency $\mathbf{f_N = \frac{sQ}{2\pi . J_3 w} \equiv f_R = 2{,}8398447.10^{10}}$ s^{-1}.

IN MRI , this is the Transverse-Presession , where B-Vector creates an RF Signal from the Precessing Protons , and **Conserved Energy is the frequency** $\mathbf{f_N = f_R}$. **Because of the Magnetic-field** created **On-Orbit and Applied at-Nucleus with the same Effect then , exists LARMOR Equation as ,** $\mathbf{w_0 = \gamma . \beta_0 / 2\pi}$ **,** and for Hydrogen at 1,5 T Magnet , $\boldsymbol{\gamma = 2{,}675.} 10^8$ /sT, $\boldsymbol{\beta_0}$ = 1,5 T , then an-frequency **w** = 63,864 MHz = $63{,}864.10^8$ Hz , frequency $\mathbf{f_N = 2\pi.w = 4{,}012575.\ 10^{10}\ s^{-1}.}$

Remark – 2 .

The Accumulation of Energy as (e) creates the [**The-Proton–Electron-Vector-Bracket**] which is the BONDING - FREQUENCY , $\mathbf{f_N = [\frac{sQ}{2\pi . J_3 w}]}$,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 $\mathbf{f_R}$ and **requires more Energy Input** including that of frequency . Nucleus with Spin S ≠ 0 can absorb and emit Electromagnetic Radiation and undergo , **Resonance** , when placed in a magnetic field . **This Uniform-Magnetic-field of** Nucleus-Orbit **[p ↔ e] already exists in Protons** which Eternally becomes from the Swinging of the **Electron**-Angular-velocity Cone **, with Spin-Vector** $\bar{S}$ 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** $\dot{\psi}$,is under **NUTATION** $\dot{\vartheta}$ **,** and the **Response** is the **PRECESSION** $\dot{\varphi}$, or it is → **THE ELECTRON-NUTATION** ← due to **Gravity** is applied for a short time in the **Plane Perpendicular , ⊥ , to the variated Moment-Vector ,** $|\bar{R}| \equiv |\mathbf{M_T}| = |\mathbf{M_N}|+|\mathbf{M_O}|$ and the Work produced is **Conserved** in → Nucleus-Orbit **[p ↔ e]** ≡ the [Energy-Box] .
The Angular-velocity-cone , $\bar{w}$ **, is Rolling with Spin-Vector** $\bar{B}$ **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 ≡ The Energy***.
In figure 12, is shown the **Magnetic –Dipole-moment** of nucleus which is associated with the Orbital Angular Momentum $|\bar{B}|$, ***the Spin*** , resulting to the $\bar{R}| \equiv |M_T| = |M_N|+|M_O|$

When an External **Static-Magnetic-field** is Present then → **The Spectral-lines** ← ***Split into*** **Multiple-closely-Spaced-lines**, because of the **Released-Energy** in the **Magnetic-Field** , **Due to the Duality-Photon** as , $\bar{\nu}\,[\frac{\sigma}{2\pi r}+\frac{\sigma\Phi}{2\pi r}\,] \equiv \bar{\nu}.[\,\boxed{\bar{f}_n}+f_n\,]$,

Above Zeeman-effect , ***In Astrophysics*** , is the trap of Magnetic field $\bar{\mathbf{B}}_{\mathbf{C}} \equiv [\frac{2\pi.\mathbf{m}_T}{\mathbf{q}_T}].\mathbf{f}$ 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 $\bar{\mu} = \bar{B}$ by flipping the orientation of the Magnetic - Moment .
As was calculated for the **Strength** of an **Magnetic-field** of 1 Tesla the Static-Moment = $1{,}174462.10^{-4}$ = $11{,}74462.10^{-5}$ eV. In the Absence of Electron , $|M_T| \equiv |M_N| \equiv$ The Spin exists only as Nucleus-Magnetic-Field $\bar{B}_L$ **.** The Kinetic Rotational-Energy in a monad , is the Scalar Quantity , L = E , while the Vectors of , *Angular-Momentum* $\bar{B} \equiv \bar{S}$, and that of *Angular-Velocity* $\bar{w}$, are related in monads as $\bar{B}\,.\bar{w} = 2L = J\,.w^2$ Analysis in [90] .

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

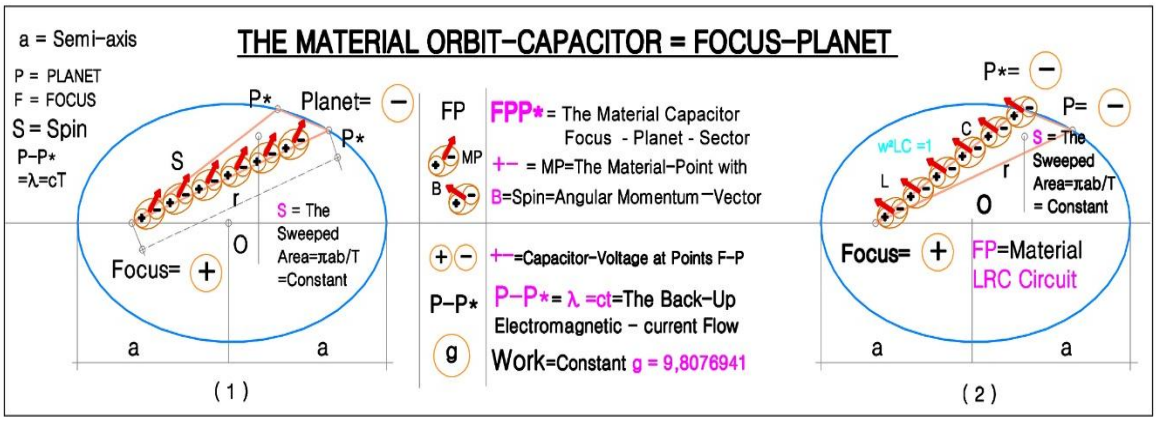


Figure -12- : The Material , **LRC Circuit** on **Orbit** , on Focus-Planet-Sector |F↔P| :
In the Undamped **Planck`s** - Conservative -**System** , the Total-Energy in **Hydrogen-cave** is , - 13,6 eV , corresponding to the Natural-frequency of the ***Primary-Particle*** with the less ***Negative-Charge-frequency*** , which is **The electron** and which mass $\mathbf{m_e}$ **,** and frequency $\mathbf{f_e}$ follow the minimum energy **g** . Electrons-equation of motion is $\ddot{x} + w^2 x = 0$ with solution $\mathbf{4\,\pi\,f^{\,2}_e\,.\,m_e = g}$, where The Reaction to the Change of motion , *Electron mass* $m_e = \frac{g}{4\pi f^2_e}$ and the Primary equation of Electron → $\mathbf{w^2_e\,.\,m_e = \pi\,g = constant}$ ← …. (m)
Hydrogen-cave is **a Vacuum** in where exist also the **Lattice-Stationary-Spinning-Material Point ,** where Energy in **Cave a** ,is equation $E = \frac{\mathbf{k}}{\mathbf{a}} + \frac{\mathbf{L^2}}{\mathbf{2m\,a^2}}$ and Unit-energy **k** becomes from equation $a^3.f^2_n.k = 1$ and is $\mathbf{k\,a} = \frac{1}{a^2f^2}$, and from velocity c = w a = 2πfa is , $f^2a^2 = \frac{c^2}{4\pi^2}$ or

k a = $\frac{4\pi^2}{c^2}$ and **Resonance - Energy** → $\mathbf{E} = \frac{ka}{aa} + \frac{L^2}{2m\,a^2} = \frac{1}{a^3}\left[\frac{4\pi^2}{c^2} + \frac{S^2}{2m}\right]$ …..(re)

A… The Gravity-System , It is Another Infinite ± Equilibrium-Rotating vectors $\bar{\mathbf{r}}$, where for Stability $\uparrow\bar{\mathbf{r}}\downarrow\bar{\mathbf{r}} = \mathbf{0}$, and which ***Gravity-System*** interacts with ***Hydrogen-Cave-System*** . The condition for ***Irrotational Energy*** is → $\nabla x\bar{B} = \nabla x\bar{S} = 0$, or $\nabla x\bar{B} = \nabla\,\bar{r} + 2\pi\,mf.\bar{a} = 0$, and $\bar{\mathbf{r}} = \pm\,2\pi mf.\bar{\mathbf{a}}$. Vector $\bar{r}$, occupies Both directions for Rotational - equilibrium , **i.e.** **The vector** $\bar{\mathbf{r}} = \pm\,\bar{\mathbf{B}} \equiv \bar{S}_n = 2\pi m\mathbf{f_n}$, and $\mathbf{f_n} = \frac{B}{2\pi\,m_e} = \frac{E}{h}$, **is the Stationary-Filling-Ocean of the Spinning-Gravity-Material Point , in the called Empty-Space** ,with frequency that of Material-Point → $f_n = n.f_1 = \frac{E}{h} = \frac{n.v}{2\pi r} = \frac{n\sigma}{4\pi r}\,[1+\sqrt{5}]$, and from v = w r = 2πf r then , $\mathbf{f_n} = v/2\pi r = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\sigma.\Phi}{2\pi.r_n}$, where $\mathbf{v = \sigma\,.\,\Phi}$, and Spin $\mathbf{S_n} = \bar{\mathbf{B}} = J\,w = \boldsymbol{\pi^2.\,r^4\,.\,f_{n=e}}$

B… The Hydrogen-Cave-System . From the **Nucleus -Planet** velocity equations $K_E = \frac{mv^2}{2} = E - \left\{\frac{k}{r} + \frac{L^2}{2m\,r^2}\right\} = 0$, $4\pi f^2{}_e\,.m_e = g$, and for $E = \frac{\pi g}{r} + \frac{L^2}{2(g/4\pi f^2)\,r^2} = \frac{\pi}{g\,r^2}\,.\,[g^2\,r + 2.S^2.f^2] = 0$, then issues $[g^2\,r + 2.S^2\,f^2] = 0$, or $f^2 = \frac{r.g^2}{2L^2} = \frac{r.g^2}{2B^2w^2} = \frac{r.g^2}{2B^2(2\pi f)^2} = \frac{r.g^2}{8B^2\pi^2,f^2}$, since 2L = B w , then the **Cave-Resonance-frequency** of Nucleus-Planet is → $\mathbf{f_c{}^4} = \frac{r_c.g^2}{8\pi^2 S_c{}^2}$ …f.(c) where $\mathbf{r_c}$ = Nucleus –Planet-Segment , and $\mathbf{S_c}$ = the Spin of cave , consisting the Cave-System . **Communication** between the two Systems happens with their ***Resonance-frequency*** , and when $\mathbf{f_n}^4 = \left|\frac{\sigma.\Phi}{2\pi.r_n}\right|^4 = \frac{r_c.g^2}{8\pi^2 S_c{}^2}$ or as $\sigma^4\,.\Phi^4\,.[\,8\pi^2.\boldsymbol{S^2_c}\,] = r_c.g^2.[16.\pi^4\,.r^4{}_n\,]$. Rearranging , $\sigma^4\,.\Phi^4\,.\boldsymbol{S^2_c} = r_c.g^2.2.\pi^2.r^4{}_n$, or $\left|\frac{\sigma.}{r_n}\right|^4 = \frac{2.\pi^2.r_c.g^2}{\Phi^4.S_c{}^2} = \frac{2.\pi^2 g^2}{\Phi^4}\left[\frac{r_c}{B^2}\right] = \frac{16.\pi^4.f^4{}_n}{\Phi^4}$, and Resonanse frequency $f^6{}_{Resonance} = \frac{g^2}{8\pi^2 r_c{}^2\,B^2}$,and $\mathbf{f^3_{Res}} = \frac{g}{2.\sqrt{2}.\pi r|B|}$, or $f^2{}_{Resonance} = \frac{g}{\sqrt{2}.\sigma\Phi|B|}$ …(f.r)

This **Frequency-Path-way** through the line-Series of the infinite Spins $\bar{\mathbf{B}}$, *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 ,

Total Kinetic Energy → $E = \frac{1}{2}.m_1.v_1{}^2 + \frac{1}{2}.m_2.v_2{}^2$, and because $v_1 = v_2 = v$, then $E = \frac{v^2}{2}[m_1 + m_2]$, and since $m_1 = \frac{F}{g1}$, $m_2 = \frac{F}{g2}$, $\bar{v} = \bar{r}$, and for Unit Work E = 1 , exists $\mathbf{E} = \frac{v^2}{2}[m_1 + m_2] = \frac{r^2}{2}\left[\frac{F}{g1} + \frac{F}{g2}\right] = \frac{F.r^2}{2}\left[\frac{1}{g1} + \frac{1}{g2}\right] = \frac{F.r^2}{2}\left[\frac{g1+g2}{g1*g2}\right] = \frac{F.r^2}{2}\left[\frac{2.g}{g^2}\right] = \frac{F.r_c{}^2}{g} = \mathbf{1}$, i.e. **Unit Work of force , F ,** ***between*** **Two masses** ***of constant Distance*** $\mathbf{r_c}$, ***is Proportional*** to a Constant and Minimum Acceleration , **g** , **the Layer , Stress** g ≡ 9, 8076925 , and is ***inverse square to the distance as*** $F = \frac{g}{r_c{}^2}$ ...(**r**) ,i.e. → **is Newton`s and Coulomb Laws** ← ***Gravitational-Constant*** **Force ≡ G** , is Spread -over ***a minimum - Surface , the Layer or Conductor or ,*** **a-Surface ,** ***or*** **The-Permissible-Path** , in-where exists Reaction and **called** Impedance ≡ mass . The Surface-force **,** $\mathbf{g_G}$, ***becoming from the inner acceleration*** $\mathbf{f_n}$ ***of Material-Points as Vector*** , $\bar{r} = \pm\,\bar{B} \equiv \bar{S}_n$ **,** is acting on Spins $\bar{\mathbf{B}}$ **,** ***and all the masses of the universe ,*** or is Action of G → on $\bar{g}$ → on $\bar{B} \equiv \bar{S}$ → on $\mathbf{g_G}$, through $\mathbf{f_{Resonanace}}$ Since $\mathbf{f_{Resonanace}} = \sigma\,\Phi^3 = G$, then $\sigma = \frac{G}{\Phi^3} = \frac{G.\sigma^3}{c^3}$, and $\boldsymbol{\sigma^2\,G = c^3}$, where σ , is Stress $\boldsymbol{\sigma_{Res}}$ between all frequencies . **Stress** $\boldsymbol{\sigma} = \sqrt[2]{\frac{c^3}{G}} = \frac{(2{,}9982.10^8)^3}{(6{,}673692.10^{-11})} = 6{,}3548867.10^{17}$ Kg/m2

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** , is for , $w^2 = [\,k/m\,]$ the equation , $m\,\ddot{x} + w^2\,x = 0$, with solution → the Period $\mathbf{T} = 2\pi\sqrt[2]{\frac{m}{k}}$, frequency $\mathbf{f_H} = \frac{1}{2\pi}\sqrt[2]{\frac{k}{m}}$, and Energy = h f_H .....(1)

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

Hydrogen Diameter $\mathbf{a_H} = \sqrt[3]{\frac{1}{g\,f^2}} = \sqrt[3]{\frac{h^2}{g\,E^2}} = \sqrt[3]{\frac{[6{,}62606957.10^{-34}]^2}{9{,}808.(\mathbf{13{,}6}.1{,}60218.10^{-19})^3\,J}} = 2{,}1127839.10^{-11}$ m

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

For Total mass $\mathbf{M_T}$ issues ***The Parallel Connections Resistors*** inverse law , as in Electricity .

The Parallel LRC Circuit , with Impedance ≡ 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 $(w_o)^2 = LC$

2.. Total-Resistor $R_T = [\frac{1}{m_1} + \frac{1}{m_2} + \frac{1}{m_3} + .. \frac{1}{m_n}]$,Total-Inductance $L_T = \{ [\frac{1}{q_1} + \frac{1}{q_2} + .. \frac{1}{q_n}] \}. w_o$

3.. Total-Capacitance $C_T = \frac{1}{C_T} = [\frac{1}{n_1} + \frac{1}{n_2} + .. \frac{1}{n_n}] .w_o$,and supply the Current $I_s = \frac{V_s}{Z_T}$. and

4.. $\mathbf{f_{Reson}} = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}}$,with **Impedance ≡ Resistor** and w_0=1 **System-Resistor unaffected**.

Remarks :

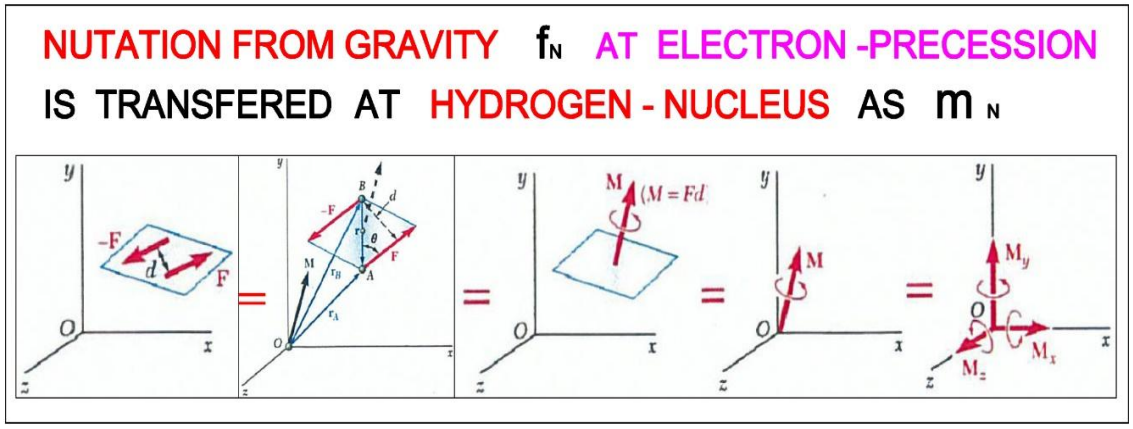
1.. From Light-velocity-equation $\bar{v} = [\frac{G\,\Phi}{A}] = \bar{c}$ **,** Force $\bar{G}$ and velocity vector $\bar{c}$ are ***Aligned*** therefore Photon $\{ \bar{c} . \boxed{\bar{f}_n} + \bar{c} . f_n \}$ ≡ Particle + Wave , follows the ***Rectilinear motion*** .

In Planck`s length $\mathbf{L_P}$ **,** The light velocity **vector** $\bar{c} = \frac{G\,L_P}{r.\Phi^2}$ is acting on cave , $\mathbf{r = L_P}$ **,** finds The Impedance = mass m_g , becomes the Centrifugal-Force F_g of Cave which is Equal to the Gravity g , **while vector** $\bar{v} = \bar{c}$ Acting on **a-cave** , $r \neq L_P$, finds The-Impedance $\mathbf{Z_c}$ of the Velocity $\bar{c}$, and becomes the minimum-Energy-cave in L_P , which is $E = \mathbf{r\ Z_c\ \bar{c} = h}$, and $\mathbf{r} = \frac{h}{c.Z_c} = 2{,}1127839.10^{-11}$ m . From Kepler-second law of Areas , g $r^3\ \mathbf{f^2_p} = 1$, the frequency f = 3,2839982.10^{15} H and Energy E = h f = **13 ,6 eV** , which is that of Hydrogen cave .

2.. From Electron-velocity-equation $\bar{v} = wr = 2\pi f r$ and from Kepler $4\pi^2\ f^2_e .m_e = k = \pi g$ then $v_e = r . \sqrt{\frac{g}{m_e}}$, therefore Electron follows , ***Curvilinear motion*** and that of Gravity .

From Force $G = \sigma A = [\frac{2\pi r f}{\Phi}].A = w\ r.[\frac{A}{\Phi}] = \bar{v}\,[\frac{A}{\Phi}]$, then is → The moving $\bar{c}$ in Storage $\frac{A}{\Phi}$

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



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

F.. : **THE NEW ATOMS –STRUCTURE** .

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

Figure - 13 - : The Orbit-Electron-Spin is applied on the Nucleus-Proton-Spin : Spin is a Free-Vector of Electron and can be applied at **Any-Point** with the same effect. Couple ≡ Moment **M** =F**x**d → Vector , and may be resolved into **Component-vectors** Electron-Nutation-Vector $\mathbf{M_O}$ is the Resolved **Component-vector** $M_N + M_O$ 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 Kepler equation , $a^3 f^2 g = 1$, or $a = \sqrt[3]{1/g f^2} = 2{,}1127839.10^{-11}$ m , in the Planck cave $\mathbf{L_P \equiv e^{-i.(\frac{5\pi}{2}).10}} \equiv \sqrt{3}.\pi.\ \mathbf{1,\ 616199}.10^{-35}$ m . The why such , was prior referred in 6d .

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** , $\mathbf{r} \neq L_P$, finds The-Impedance $\mathbf{Z_c}$ of the Velocity $\bar{\mathbf{c}}$, and Becomes the minimum-Energy-cave in L_P , and Equal to $\mathbf{E \equiv r\ Z_c\ \bar{c}}$, where **E** = The Planck`s-Total-Energy $\mathbf{E_p = h}$ = 6,62606957.10^{-34} J.s , **r** = The min-Energy cave of Hydrogen , $\mathbf{Z_c}$ = The Total Impedance in Universe ≡ Space + Anti-Space from velocity motion $\bar{\mathbf{c}}$ = The light-velocity in m/s . Equation becomes → r Z_c c = E = h ← . The **Three Elements** ≡ Digits of Material-Geometry are {⊕ , [⊕↔⊖] , ⊖} ≡ [+, 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*** $\mathbf{10^{-10}}$ of their **g-Position** so Antilog $_{10}^{-g/10}$ = 0 , 10460975

For the three dimensions Total-Impedance Z_c =0,10460975.$(10^{-10})^3$ = 1,046097.10^{-31} and $\mathbf{r_H = \frac{h}{c.Z_c}} = \frac{[6,62606957.10^{-34}]}{2,99798.10^8.1,0460975.10^{-31}}$ = **2,1127839.10^{-11}** m , and is the Hydrogen cave i.e.

The Quantization of **Energy ≡ Angular-Momentum** ≡ r m v , which is produced from the three Elements **r** = The Planet-Focus line , **m** = The masses , **v** = The velocity of mass and follow Kepler-second-law where for radius **r** , sweeps out Equal-Areas in equal times and consequently **Energy-Quantization** becomes from equation $a^3.f^2_n.k = 1$ where k = $[\frac{4\pi^2}{GM}]$.

The Unit-Work occurs in Hydrogen cave following Kepler-first law in Orbits , $4\pi^2.r^3f^2_p = k$, which k = The **Quantized Work** $W = v^2\ [\frac{h}{2\pi}]$ or Work = $\mathbf{k} = 4\pi^2.r^3f^2_p$ and being equal to the Unit-prior and so , $\mathbf{k} = 4\pi^2.r^3f^2_p = \frac{1}{f^2 r^3}$ which results to the Resonance frequency f_R as $\mathbf{f_R} = \sqrt[4]{\frac{1}{4\pi^2\, m\, r^3}}$ of cave **r** , and from $\mathbf{f_R}$ the **Resonance Step-cave** → **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 F = q.[E + v x B] where E = 0 and Force is $\bar{F} = q\,.\,\bar{v}\ x\ \bar{B}$. The Created Magnetic-Field $\bar{B}_F = |\frac{2\pi.M_T}{Q_T}|\ f$, where in it ***Energy ≡ motion*** is **Quantized** , i.e. Magnetic-Field $\bar{B}_F$ is the Store of Energy in motion , $\ddot{x} + w^2 x = 0$

The Resonance Energy $\mathbf{E_R}$, becomes from **The Moving Electron in Orbit** of charge $\bar{\mathbf{q}}$ ≡ ⊖ with the **Orbit-Velocity-Vector** $\bar{\mathbf{v}} = \sqrt{\frac{2}{m}[E - \{\frac{k}{r} + \frac{L^2}{2m\,r^2}\}]}$ = 0 , and this because charge $\bar{\mathbf{q}}$ **Creates IN Orbit** , **r** , the Varying and Perpendicular Magnetic-Field , $\bar{\mathbf{B}}$, which in time-turn **Creates** the Electric-field $\bar{\mathbf{E}} \perp \bar{\mathbf{B}}$, with resultant force **F** acting on Electron **. For 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 $\mathbf{k} = \frac{L}{2\,m}$ , and constant Planets relation $\frac{T^2}{a^3} = k = [\frac{4\pi^2}{G.m}] = 2{,}97.10^{-19}(s^2/m^3)$ in Planck`s length $\mathbf{a} = \sqrt[3]{\frac{1}{k.f^2}}$ then $\mathbf{k} = 1/a^3.f^2$, and **Energy E** = $\frac{1}{a^3.f^2}\left[\frac{1}{a}\right] + \frac{L^2}{2m\,a^2} = \frac{1}{a^4.f^2} + \frac{L^2}{2m\,a^2} = \frac{1}{a^2}[\frac{4\pi^2}{c^2} + \frac{L^2}{2m}]$ **, or** $\mathbf{E = \frac{1}{a^2}[\frac{4\pi^2}{c^2} + \frac{L^2}{2m}]}$, $\mathbf{a^2 = [\frac{1}{E}].[\frac{4\pi^2}{c^2} + \frac{L^2}{2m}]}$, and **Stored in the Magnetic field** i.e. Exists only **Potential-energy L** and the ***Orbit is that of Circle*** .

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

3.. Hydrogen - Cave is a ***Uniform-Magnetic- field* ,** Because $\bar{B}_L$ **, is Independent** of the **Electron-velocity** v_e and of the **Cave-radius** , r ≡ a , therefore electron is not accelerated in the Magnetic-Field , but its Strength is **Dependent on frequency , f** , only .

This demand formulates the Hydrogen-Energy-caves and the **Quantization** of Energy ≡ 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** .

2f.. The Elements in the Atom cave → { Masses – Charges – Caves }

a-***Proton***⊕→ mass $\mathbf{m_p}$ = 1,672.10^{-27} Kg →Charge $\mathbf{C_p}$ =1,602.10^{-19} C → **d** = 8,4.10^{-16} m

b-***Electron***⊖→mass $\mathbf{m_e}$ = 9,11.10^{-31} Kg →Charge $\mathbf{C_e}$ =1,602.10^{-19} C → **d** = 5,0.10^{-17} m

c-***Neutron***[⊕↔⊖]→mass $\mathbf{m_n}$ = 1,672.10^{-27} Kg →Charge $\mathbf{C_n}$ = 0 ,0 C → **d** = 1,7.10^{-15} m

d... **Newton `s law** for masses is the Force → $\mathbf{F_N = G\ \frac{m_1.m_2}{r^2}}$, where d = r .

e... **Coulomb law** for Charges is the Force → $\mathbf{F_c = C\ \frac{q_1.q_2}{r^2}}$,

f – **Kepler laws** for **Planets** and **Constant-Areas** is , $\mathbf{4\pi^2.m.f^2_n = k}$, $\mathbf{k.f^2_n.a^3 = 1}$

g – **Magnetic-fields laws** for **Charges** and **Periods** is , $\mathbf{T} = \frac{2\pi.m_T}{q.\bar{B}_F}$, $\bar{B}_F = \frac{2\pi.m_T}{q.T} = \frac{|2\pi.m_T|}{Q_T}$ f

h – The United Newton-Coulomb **Electro-Mechanical** Equation , $\mathbf{q\,\bar{B}_L = 2\pi\ m\ f}$, and the Resonance frequency $f^4 = \frac{1}{4\pi^2 m a^3}$, or $\mathbf{f_R} = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}}$ between Charges and masses .

The Total-energy for Unit-mass $E_T = K_E + P_E$, is from equation $\acute{x} \equiv \sqrt{\frac{2}{m}[E - \{\frac{k}{a} + \frac{L^2}{2m\,a^2}\}]} = c$

where for → $K_E = 0$, $c = 0$, $E = \frac{m.c^2}{2} + \{\frac{k}{a} + \frac{L^2}{2m\,a^2}\}$ ← Energy becomes $\mathbf{E} = \frac{k}{a} + \frac{L^2}{2m\,a^2}$ **or ,** Above configuration of , masses $\mathbf{m_L}$ **,** Charges $\mathbf{q_L}$ in a Hydrogen cave **a** , **Forms** a Harmonic Oscillator with a Natural Frequency f_R with the less Damping-factor (1/m).

The Quantum of a Magnetic-Field $\bar{B}_L$ in a cave , 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** → $q\,.\,\bar{B}_L = [\,2\pi.m_L\,].f_R$ ← 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 $\mathbf{\bar{B}_F}$, 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 Magnetic-field $\bar{B}_F$ and the same for , **Masses , Charges , Caves** , as ,

1….. Case –A- → **1-Proton** [⊕] , 1-**Electron** [⊖] , **1-Newtron** [⊕↻↺⊖] – [⊕↔ ⊖] :

The Nucleus Total-Harmonic mass ≡ M_T is → $\frac{1}{M_T} = \frac{1}{m_P} + \frac{1}{m_n} + \frac{1}{m_e} = \frac{10^{27}}{1,672} + \frac{10^{27}}{1,672} + \frac{10^{31}}{9,11}$

$= \frac{10^{31}}{8360} + \frac{10^{31}}{9,11} = \frac{10^{31}}{9,100084}$, and the **One -Total-mass** $M_T = 9,100084.10^{-31}$ Kg ...(1)

The System 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 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 $1 = k\,.\mathbf{f^2{}_o\ a^3}$. Their common k , is Constant-Energy → $k = 4\,\pi^2\,m\,f^2{}_o = \frac{1}{f^2{}_o\ a^3}$ or , $f^4 = \frac{1}{4\pi^2 m a^3}$ and $f = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}}$ ...(f)

With this way , ***Impedance ≡ 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 **m** = $M_T = 9,\ 100084.10^{-31}$ Kg . The Resonance-Cave-frequency is as (f) ,

$f = \sqrt[4]{\frac{1}{4\pi^2 m.a_H{}^3}} = \sqrt[4]{\frac{1}{4\pi^2 9,100084.10^{-31}(2,1145016.10^{-11})^3}} = \sqrt[4]{2,94439610^{60}} = 1,3099329.10^{15}$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** $\bar{B}_F = |\frac{2\pi.M_T}{Q_T}|f$

The Magnetic-field-Strength $\bar{B}_F = |\frac{2\pi.M_T}{Q_T}|f = \frac{2\pi.9,100084.10^{-31}.[1,3099329.10^{15}]}{[3,2044.10^{-19}]}$ (Kg/Cs) =

$2,3373706.10^4$ Tesla ...(4) i.e. $\mathbf{\bar{B}_F}$ **= 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** = $\sqrt[3]{T^2/g} = \sqrt[3]{1/g\,f^2} = \sqrt[3]{1/g\,[\,1,3099329.\,10^{15}\,]^2} = \sqrt[3]{7,78342.\,10^{-33}}$

$= 1,9817863.10^{-11}$ m , and the **Resonance - Energy** $\mathbf{E} = \frac{1}{a^3}[\,\frac{4\pi^2}{c^2} + \frac{L^2}{2m}\,]$, where

L = the Spin S = 5,691952. 10^{-34} {Kg/m/s} , mass $\mathbf{M_T}$ = $9,100084.10^{-31}$ Kg of System , **c** ≡ $2,998.10^8$ m/s **.** and **E** = [$2,5461638.10^{21}$] x [$4,392086.10^{-16} + 1,780111.10^{-37}$] =

$= 1,118297.10^6$ J + $4,5324541.10^{-16}$ J ……..(E)

i.e. Energy in Electron-Orbit is $1,118297.10^7$ J , or 11,2 Million Joules ,

2….. Case –B. → **1-Proton** [⊕] , 1-**Electron** [⊖] :

The Nucleus Total-Harmonic mass ≡ 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 $\bar{B}_F = |\frac{2\pi.M_T}{Q_T}|f = |\frac{2\pi.m_T}{q_+}|f = \frac{2\pi.9{,}105.10^{-31}[1{,}3097561.10^{16}]}{3{,}2044.10^{-19}.}$[Kg/C.s]

= 2,5424947.10^5 Tesla ≡ **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

$E = \frac{1}{a^3}[\frac{4\pi^2}{c^2}+\frac{L^2}{2m}]$, where L = the Spin S = 5,691952. 10^{-34} {Kg/m/s} , c ≡ 2,998.10^8 m/s .

mass M_T = 9,105044.10^{-31} Kg of System , Energy is E = [2,9522561.10^{30}] x

[4,392086.10^{-16} + 1,7791411.10^{-37}] = 1,2966562.10^{15} J + 5,2524801.10^{-7} J ……(E)

i.e. Energy in Electron-Orbit is 1,29.10^{15} J , or 12,9 quadrillion Joules ,
and equal about 60 Megatons of TNT .

When an **Electron** of mass $\mathbf{m_e}$ = 7,2373149.10^{-32} kg is found in above Magnetic-field then

$\mathbf{f} = \sqrt[4]{\frac{1}{4\pi^2 m.a_H{}^3}} = \sqrt[4]{\frac{1}{4\pi^2 7{,}237.10^{-32}(2{,}1145016.10^{-11})^3}} = \sqrt[4]{37{,}022376.10^{60}}$ = **2,4663545.10^{15}** H

and Energy E = h f = 6.62607.10^{-34} . 2,4663545.10^{10} = 1,6342237.10^{-18} J / (1,6.10^{-19}) =

= **10 , 201146** eV , which is the **Energy in** n =1 ***Energy-Level*** , or

From equation $m_e = \frac{g}{4\pi f^2{}_e}$, f_e= E / h = [-13,6 eV/h] then $f = \sqrt[4]{\frac{E^2}{4\pi^2 a_H{}^3[g.h^2]}} = \sqrt[4]{\frac{E^2}{\pi g h^2 a_H{}^3}}$

3….. Case –C. → **1-Proton** [⊕] ≡ An **Ion-nucleus** :

The Nucleus Total-Harmonic mass ≡ M_T is → $\frac{1}{M_T} = \frac{1}{m_P} = \frac{10^{27}}{1{,}672}$ and M_T =1,67.10^{-27} Kg

or M_T = 1,67.10^{-27} Kg / **1,66053886.10^{-27}** amu **= 1 amu** ……...(1)

The Nucleus-Orbit Total-Harmonic-Charge → $Q_T \equiv q_p$ = 1,6022.10^{-19} ……...(2)

The Resonance-Cave-frequency is $f = \sqrt[4]{\frac{1}{4\pi^2 m.a_H{}^3}} = \sqrt[4]{\frac{1}{4\pi^2.1{,}672.10^{-27}8.(2{,}1127839.10^{-11})^3}}$ =

$\sqrt[4]{2{,}0051704.10^{60}}$ = 1,189975.10^{15} H ..(1). **The System** M_T = **masses ,** Q_T= **Charges creates a constant Magnetic-field** $\bar{B}_F = |\frac{2\pi.M_T}{Q_T}|f$, of **Strength** $\bar{B}_F = |\frac{2\pi.M_T}{Q_T}|f$ as ,

$\bar{B}_F = \frac{2\pi.1{,}672.10^{-27}.[6{,}32705.10^{14}]}{1{,}6022.10^{-19}.}$ (Kg/Cs) = 4,1464883.10^7 Tesla ...(3) i.e.

$\mathbf{\bar{B}_F}$ **= 4,1464883.10^7 Tesla** → ***the Strength of a Non-magneton neutron-Star***,

Energy in an Proton-cave Proton of radius r_p= 8,42.10^{-16} m , follows Energy-equation

$E = \frac{1}{a^3}[\frac{4\pi^2}{c^2}+\frac{L^2}{2m}]$, where L = the Spin S = 5,691952. 10^{-34} {Kg/m/s} , c ≡ 2,998.10^8 m/s .

mass M_T =1,67.10^{-27} Kg of System , Energy is E = [1,4105087.10^{30}] x[-]

[4,392086.10^{-16} +9,7000946.10^{-41}] = 6,1950755.10^{14} J + 1,3682067.10^{-10} J

For the **Ion-Proton** $E = \frac{k}{a} + \frac{L^2}{2m\,a^2} = [\frac{L}{2m}].\frac{1}{a} + \frac{L^2}{2m\,a^2} = \frac{L}{2a.m}[1+\frac{L}{a}]$ where $\mathbf{a_p}$ is Proton-cave

L is the Spin **S** , and **m** is the mass of Nucleus , Placing above quantities then Energy is

$E = \frac{5{,}691952.10^{-34}}{2.1{,}67.10^{-27}.8{,}4.10^{-16}.}[1 + \frac{5{,}691952.10^{-34}}{8{,}4.10^{-16}.}]$ = 2,028782.10^8 + 1,3747296. 10^{-10} Joule .

i.e. Energy of Charge-Proton is 0, 203.10^9 J , or 0,203 Giga-Joules
and , it is equal about to the reduced Planck energy .

Remark : Cave 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 .

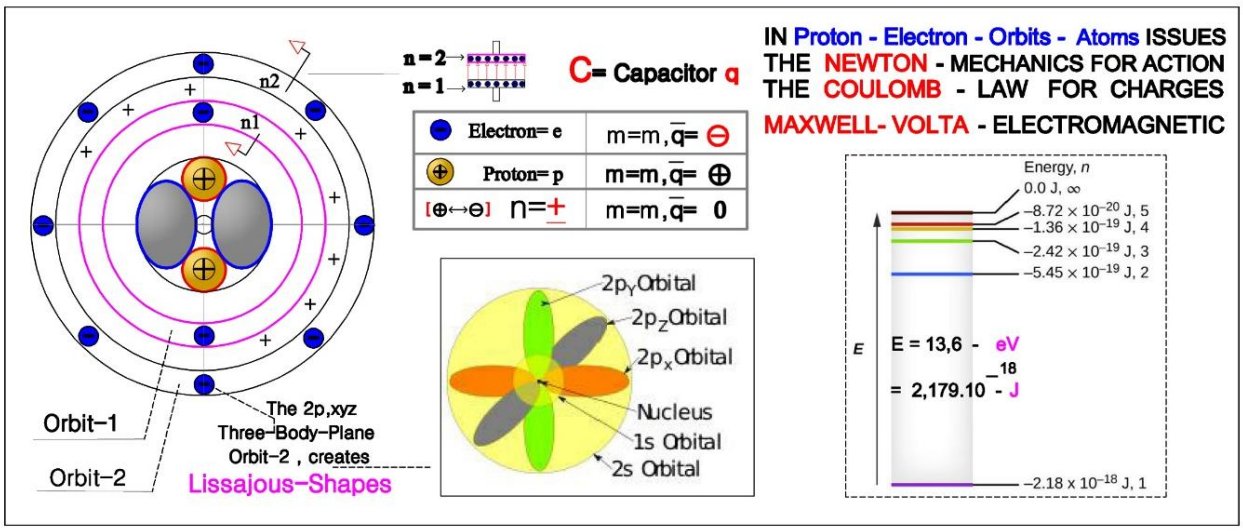
This case is very interesting because it is the Quanta of Electron in microcosm and macrocosm i.e. the Spin of Electron is squeezing in the direction of the field - *Space* . **Since Energy exists on Magnetic-moment axis and Spin Precesses** , the highly magnetized vacuum must behave like a Prism that **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** $\mathbf{\bar{B}_L}$ in an Hydrogen cave **a**, **is 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 $\bar{q}$ → Is the ***Quantum*** of the Efficient-Energy .

2.. Photon → Is the ***Quantum*** of Electromagnetic Field $f_n = [\frac{n}{\pi^2 r^4}].\bar{B} \equiv \frac{(1+\sqrt{5}).\sigma}{4\pi r} = \frac{E}{h}$

where its Duality is as → $\bar{v}\,.\,\{\ \boxed{\bar{f}_n} + f_n\ \} \equiv |\frac{v}{\pi^2.r^4_n}|.\boxed{\bar{B}_n} + |\ \bar{c}\ |\ f_n$



3.. $\bar{q}_{\text{Photon}} \rightarrow \frac{G}{\sqrt{2}.f} = \frac{G.h}{\sqrt{2}.E} = 3{,}13\ 10^{-44}$ C , Is the ***Quantum*** of Material-points .

4.. $\bar{q}_{\text{Electron}} \rightarrow \frac{G}{c\sqrt{2}} = 1{,}58.10^{-19}$ C , Is the ***Quantum*** of the Plane-Magnetic-field .

Figure-14- : The Analogous **RLC-Electric-Circuit** of **Atom`s Structure** and Mechanics

Remarks :

The Case –A- 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 $E_T = K_E + P_E = (½)\,.\,\dot{x}^2 + U(x) =$ constant and solving for $y = \dot{x}$ this Ordinate of the Phase Plane is given by 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 , as the linear-equation $\ddot{y} + w^2 y = 0$, of the $\mathbf{x \perp y}$ Plane and which follows the ***Lissajous Shapes*** .

The Case –B- is composed of the two masses ,m_p , m_e ,which consist a Vector on which the Vibration of Charge Q_p is executed in the direction of Vector $\overline{PE}$. The ***Resonance Frequency*** $f = 1{,}3097561.10^{16}$ H , and The ***Magnetic-field-Strength*** $\bar{B}_F = 9{,}3530401.10^5$ Tesla and are the ***Quantum of Energy-Space*** in Hydrogen cave **a** .

The Case –C- is composed of One mass in its Proton-cave with an ***Magnetic-field*** **Strength** $\bar{B}_F = 4{,}1464883.10^7$ Tesla = **41,464883Mega-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 Magnetic-moment axis and Spin Precesses** , 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.

4….. Case –D- → **2-Proton** [⊕] , 2-**Electron** [⊖] ,**2-Newtron** [⊕∪↺⊖] – [⊕↔ ⊖] :

The Nucleus Total-Harmonic mass ≡ M_T is → $\frac{1}{M_T} = \frac{2}{m_P} + \frac{2}{m_n} + \frac{2}{m_e} = \frac{2.10^{27}}{1{,}672} + \frac{2.10^{27}}{1{,}672} + \frac{2.10^{31}}{9{,}11} = \frac{10^{31}}{400{,}55} + \frac{10^{31}}{4{,}555} = \frac{405{,}105.10^{31}}{1824{,}5052} = \frac{10^{31}}{4{,}5037834}$, and $M_T = 4{,}5037834.10^{-31}$ Kg .....(1)

The Nucleus-Orbit Total-Harmonic-Charge → $Q_T \equiv 2.q_p + 2.q_e = 2.1{,}6022.10^{-19} + 2.1{,}6022.10^{-19} = 6{,}4088.10^{-19}$ and **System-Resonance-Charge** $Q_T = 6{,}4088.10^{-19}$ ….(2)

The frequency of the Closed-Nucleus-Orbit-System becomes from Kepler second Planetary law equation , $4\,\pi^2\,m\,f^2{}_o = k$, and constant law of areas $1 = k\,.\mathbf{f}^2{}_o\ \mathbf{a}^3$. Their common k , constant energy is $k = 4\,\pi^2\,m\,f^2{}_o = \frac{1}{\mathbf{f}^2{}_o\ \mathbf{a}^3}$ or , $f^4 = \frac{1}{4\pi^2 m a^3}$ and $f = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}}$ becomes

$f = \sqrt[4]{\frac{1}{4\pi^2 m.a_H{}^3}} = \sqrt[4]{\frac{1}{4\pi^2.4{,}5037834.10^{-31}.(2{,}1145016.10^{-11})^3}} = \sqrt[4]{5{,}949276.10^{60}} = 1{,}5617663.10^{15} H$

The System M_T = **masses ,** Q_T= **Charges creates a constant Magnetic-field** $\overline{B}_F = |\frac{2\pi.M_T}{Q_T}|f$

M-field $\overline{B}_F = |\frac{2\pi.M_T}{Q_T}|f = \frac{2\pi.4{,}5037834.10^{-31}[1{,}561766.10^{15}]}{6{,}4088.10^{-19}.}$(Kg/Cs) = 6,8959836.$10^3$ Tesla ….(4)

$\overline{B}_F$ = 6,8959836.10^3 T = 6,89598.10^3 **Kilo-Tesla →** ***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 $\mathbf{a} = \sqrt[3]{T^2/g} = \sqrt[3]{1/g\,f^2} = \sqrt[3]{1/g\,[1{,}5617663.10^{15}]^2}$ = 6,5283506.10^{-9} m and follows equation $E = \frac{1}{a^3}[\frac{4\pi^2}{c^2}+\frac{L^2}{2m}]$ where L = the Spin S = 5,691952. 10^{-34} {Kg/m/s} , mass M_T = 4,5037834.10^{-31} Kg of System , c ≡ 2,998.10^8 m/s **.** E = [2,3463513.10^{16}] x [-] = [4,392086.10^{-16} +3,5967888.10^{-37}] = 10,305376.10^0 J+8,43933.10^{-21} J …..(E) i.e. Electron-Orbit-Energy is 10,30538 J = 6,432096,10^{19} eV become from filled Helium-orbit.

<u>5…. Case –E -</u> → 20-Proton [⊕] , 20**-Electron** [⊖] ,**20-Newtron** [⊕↻↺⊖] – [⊕↔ ⊖] :

The Nucleus Total-Harmonic mass ≡ M_T is → $\frac{1}{M_T} = \frac{20}{m_P}+\frac{20}{m_n}+\frac{20}{m_e} = \frac{20.10^{27}}{1{,}672}+\frac{20.10^{27}}{1{,}672}+\frac{20.10^{31}}{9{,}11}$

$= \frac{10^{29}}{4{,}182} + \frac{10^{32}}{4{,}5553} = \frac{10^{32}}{4{,}5500438}$, and M_T = 4,5500438. 10^{-32} Kg .....(1)

The Nucleus-Orbit Total-Harmonic-Charge → $Q_T \equiv 20.q_p + 20.q_e + 20.q_n$ = 32,044.10^{-19} + 32,044. 10^{-19} C and the **System-Resonance-Charge** Q_T = 6,4044. 10^{-18} C …...(2)

The frequency of the Closed-Nucleus-Orbit-System becomes from Kepler second Planetary law equation , 4 π² m $f^2{}_o$ = k , and constant law of areas 1 = k .$\mathbf{f^2{}_o\ a^3}$. Their common k , constant energy is k = 4 π² m $f^2{}_o = \frac{1}{f^2{}_o\ a^3}$ or , $f^4 = \frac{1}{4\pi^2 m a^3}$ and $f = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}}$ becomes

$f = \sqrt[4]{\frac{1}{4\pi^2 m.a_H{}^3}} = \sqrt[4]{\frac{1}{4\pi^2 4{,}5500438.10^{-32}(2{,}1127839.10^{-11})^3}} = \sqrt[4]{58{,}8879210^{60}}$ = 2,770171.10^{15}H..(3)

According to Planck E = h f = 6,62606957.10^{-34}.2,770171.10^{15} =1,8355345.10^{-20} Joules

The System M_T = **masses ,** Q_T= **Charges creates a constant Magnetic-field** $\overline{B}_F = |\frac{2\pi.M_T}{Q_T}|f$

M-field $\overline{B}_F = |\frac{2\pi.M_T}{Q_T}|f = \frac{2\pi.4{,}55.10^{-32}[2{,}770171.10^{15}]}{6{,}4044.10^{-18}.}$(Kg/Cs) = 1,2365715.$10^2$ Tesla ….(4)

$\overline{B}_F$ = **0,123657 Kilo-Tesla →** ***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 $\mathbf{a} = \sqrt[3]{T^2/g} = \sqrt[3]{1/g\,f^2} = \sqrt[3]{1/g\,[2{,}770171.10^{15}]^2}$ = 2,3684748 .10^{-9} m Energy equation $E = \frac{1}{a^3}[\frac{4\pi^2}{c^2}+\frac{L^2}{2m}]$ where L = the Spin S = 5,691952. 10^{-34} {Kg/m/s} , and mass M_T = 4,5500438.10^{-32} Kg of System , c ≡ 2,998.10^8 m/s **.** E = [1,7826351.10^{17}] x [-] = [4,392086.10^{-16} +3,5602202.10^{-36}] = 7,8294866.10^1 J + 6,3465734.10^{-19} J .... (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 .

<u>6….. Case –D-</u> → -2- Proton [⊕↔⊕] , **-2- Neutron** [– [⊕↔ ⊖] ≡ { The-Nucleus } :

The Nucleus Total-Harmonic mass ≡ M_T is → $\frac{1}{M_T} = \frac{2}{m_P}+\frac{2}{m_n} = \frac{2.10^{27}}{1{,}672}+\frac{2.10^{27}}{1{,}672} = \frac{10^{28}}{4{,}18}$

and M_T = 4,180.10^{-28} Kg .....(1)

The Nucleus-Orbit Total-Harmonic-Charge → $Q_T \equiv 2.q_p + 2.q_e$ = 3,2044.10^{-19} + 3,2044. 10^{-19} C and the **System-Resonance-Charge** Q_T = 6,4088. 10^{-19} C …...(2)

The frequency of the Closed-Nucleus-Orbit-System becomes from Kepler second Planetary law equation , 4 π² m $f^2{}_o$ = k , and constant law of Areas 1 = k .$\mathbf{f^2{}_o\ a^3}$. Their common k , is Constant-Energy → k = 4 π² m $f^2{}_o = \frac{1}{f^2{}_o\ a^3}$ or , $f^4 = \frac{1}{4\pi^2 m a^3}$ and $f = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}}$ ….(f)

With this way , ***Impedance ≡ 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 **m** = M_T = 4,180.10^{-28} Kg . The Resonance-Cave-frequency is as (f) ,

$f = \sqrt[4]{\frac{1}{4\pi^2 m.a_H{}^3}} = \sqrt[4]{\frac{1}{4\pi^2 4{,}180.10^{-28}(2{,}1127839.10^{-11})^3}} = \sqrt[4]{0{,}267927.10^{60}}$ = 7,19456.10^{14} H ..(3)

According to Planck E = h f = 6,62606957.10^{-34}.7,19456.10^{14} = 4,7678039.10^{-19} Joules

The System M_T = **masses ,** Q_T= **Charges creates a constant Magnetic-field** $\bar{B}_F = |\frac{2\pi.M_T}{Q_T}|f$

M-field $\bar{B}_F = |\frac{2\pi.M_T}{Q_T}|f = \frac{2\pi.4{,}180.10^{-28}[7{,}19456.10^{14}]}{6{,}4\ 088.10^{-19}}$(Kg/Cs) = 2,9483812.$10^6$ Tesla …..(4)

$\bar{B}_F$ = **2 , 9483812 Mega-Tesla** → ***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 $\mathbf{a = \sqrt[3]{T^2/g}} = \sqrt[3]{1/g\,f^2} = \sqrt[3]{1/g\,[7{,}19456.10^{14}]^2}$ = 5,81840133.10^{-10} m Energy equation E = $\frac{1}{a^2}[\frac{4\pi^2}{c^2}+\frac{L^2}{2m}]$ where L = the Spin S = 5,691952. 10^{-34} {Kg/m/s} , and mass M_T = 4,180.10^{-28} Kg of System , c ≡ 2,998.10^8 m/s in cave a = 5,81840133.10^{-10} m

E = [2,9538785.10^{18}] x[4,392086.10^{-16} +3,8753966.10^{-40}] = 1,2973688.10^3 J

+ 1,144745.10^{-19} J ….(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. → **n-Proton** [⊕] , **n-Electron** [⊖] ,**n-Neutron** [⊕↻↺⊖] – [⊕↔ ⊖] :

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 $\mathbf{10^{-35}}$ m (*this Property issues in all Geometrical caves and in a cave of ,* $\mathbf{10^{-62}}$ *m , which is the Gravity level in which Gravity - Field exists*) , and also all models of the atom as follows ,

a... In Set ↓ ≡{**Mould**≡ Space ≡Cave} → The minimum Number of Points in each Energy-Level is

1	for Material-Point ,	→	1	Point.	x 2 =	2 Elements ,
2	for Line-Vector ,	→	2	Points	x 2 =	4
3	for Plane ,	→	3	Points	x 2 =	6
4	for Volume,	→	4	Points	x 2 =	8
m	for **,m ,** Spaces	→	m	Points	x 2 =	2m

b... Elements → The maximum number of **Elements** ≡ **Digits** in Material - Point is **, 2 ,** [1 Positive ⊕ and 1 Negative ⊖] consisting the → Unit-M-P ≡ { [⊕↔⊖] , ⊕ ,⊖}

The possible Repetitive-Permutations for moulds and Elements are $\mathbf{Mould^{Elements} = m^2}$, 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	→ m =1	2	**2**	→ 2	2	Sphere ≡ S
Line-Vector	→ m =2	4	**8**	→ 2+8	10	S+ Lissajous-Figures
Plane	→ m =3.	6	**18**	→ 10+18.	28	Two-Spheres
Volume	→ m =4.	8	**32**	→ 28+32.	60	Three - Spheres
m –Space	→ m = m	2xm	**2xm²**	→	$2m^2+2(m-1)^2+2$	, m-Spaces-Volume

Photon was proved to be a Material-point in cave **r** , where its **Inner Storage** is ***the Stationary-Standing-wave*** the Electromagnetic-Wave $[E^2+H^2] = 2(2r).c.\sin 2\varphi$ with **n** Lobes representing the ***Normal mode vibration*** with frequencies $f_n = n.f_1 = \frac{E}{h} = \frac{n.v}{4r} = \frac{n\sigma}{8r}[1+\sqrt{5}]$, and **Outward the Storage** *is the Propagating Electromagnetic- Wave* →{$[\varepsilon E^2+\mu B^2] = 2.\lambda c.\sin.2\varphi$}← *where* **Particle** 2r = n λ , **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 $G = \sigma A = (2\pi f r)\frac{A}{\Phi} = w r = \bar{c} . \frac{A}{\Phi}$, ***The Action*** of G → on $\bar{c}$ and Following relation $\boldsymbol{\sigma x\ \Phi^3 \equiv G}$, and 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 , 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 $\mathbf{F_g = \bar{g}} = m_g[\frac{c^2}{r}] = m_g[\frac{c^2}{r}] = J\,w^2.\frac{c^2}{r}.g_Z =$

$[\frac{\pi r^4}{2}].[\frac{c}{r}]^2.[\frac{c^2}{r}].2^3.\ln(3).\pi\sqrt{3} = \mathbf{4\sqrt{3}.\ln 3.\pi^2 r c^4} = \mathbf{9{,}8076754}$, 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 , $\mathbf{2^3}$, In and Out the Planck- length $\mathbf{L_P = r}$. 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 the 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 ≡ M_T → $\frac{1}{M_T} = \frac{n}{m_P}+\frac{n}{m_n}+\frac{n}{m_e} = \frac{2.n}{m_P}+\frac{n}{m_e}$, because $m_n = m_P$

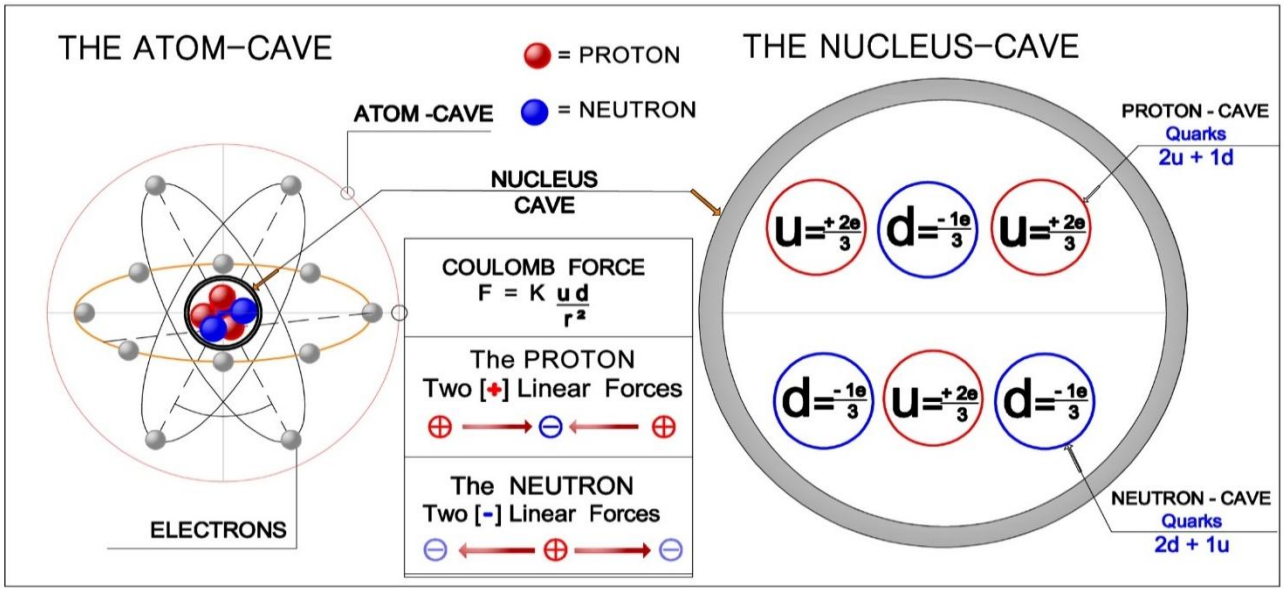
The Nucleus-Orbit Total-Charge $\equiv Q_T \rightarrow n.q_p + n.q_e$, where m_p = masses , q_T = charges

The frequency of , Nucleus-Orbit-System is $f_H = \sqrt[4]{\frac{1}{4\pi^2 M_T .(a_H)^3}}$, where a_H = Electron cave.

The constant **Hydrogen-Uniform-Magnetic-field** is $\overline{B}_{H-UMF} = |\frac{2\pi.M_T}{Q_T}|.f_H$ in Tesla ,

The Resonance - Cave , is $\mathbf{a_R} = \sqrt[3]{T^2/g} = \sqrt[3]{\frac{1}{g}.f^2_H}$ m , in Hydrogen-cave a_H in m ,

The Energy in Hydrogen-cave is $\rightarrow \mathbf{E} = \frac{1}{a_R{}^2}[\frac{4\pi^2}{c^2}+\frac{S^2_T}{2m}] = \frac{1}{a_R{}^2}[\frac{4\pi^2}{c^2}+\frac{c.a_H.S_T}{2}]$ in Tesla ,



The Electric Force between u-Quarks and d-Quarks in Protons is $\rightarrow \mathbf{F}_c = C\frac{q_1.q_2}{r^2}$ Newton .

3f... The Elements in the Proton-Neutral-caves → { **Masses-Charges-Forces** }

Figure – 15. The Structure within the Hydrogen-Nucleus of , ⊕ **Proton** , [⊕↔⊖] **Neutron**
Proton is consisted of Three-Primary-Opposite-Spaces ⊕ , ⊖ , [⊕↔⊖] , 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

The Proton Total-Harmonic mass ≡ M_T is $\rightarrow \frac{1}{M_T} = \frac{1}{m_u} + \frac{1}{m_u} + \frac{1}{m_d}$,

The System Total- Harmonic-Charge ≡ $Q_T \equiv 2.q_u + q_d = 2.(2/3).e - (1/3)\ e = +\frac{3}{3}e =$
$+ 1{,}6022.10^{-19}$ C , and the **System-Resonance-Charge** $Q_T = +1{,}6022.10^{-19}$ C ….(2)

The Proton Total- Harmonic- Charge → $Q_T \equiv 2.q_u + q_d$,and for the Resonance **Frequency** of the Unit-Cave is the Stationary-System becoming from Kepler second Planetary-law as equation , $4\pi^2 m f^2{}_o = k$, and constant law of Areas $1 = k.\mathbf{f}^2{}_o\ \mathbf{a^3}$. Their common k , is the Constant-Energy → $k = 4\pi^2 m f^2{}_p = \frac{1}{\mathbf{f}^2{}_p\ \mathbf{a^3}}$ or , $f^4{}_p = \frac{1}{4\pi^2 m a^3}$ and $f_p = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}}$

The measured magnitudes are as follows ,

a-***Proton***⊕→ mass $\mathbf{m_p} = 1{,}672.10^{-27}$ Kg →Charge $\mathbf{C_p} = 1{,}602.10^{-19}$ C → $\mathbf{a} = 8{,}4.10^{-16}$ m

b-***Electron***⊖→mass $\mathbf{m_e} = 9{,}11.10^{-31}$ Kg →Charge $\mathbf{C_e} = 1{,}602.10^{-19}$ C → $\mathbf{a} = 5{,}0.10^{-17}$ m

c-***Neutron***[⊕↔⊖]→mass $\mathbf{m_n} = 1{,}672.10^{-27}$ Kg →Charge $\mathbf{C_n} = 0{,}0$ C → $\mathbf{a} = 1{,}7.10^{-15}$ m

d-**u-*Quark*** →from equal masses $m_p = 2.m_u + m_d = 3.m_u = 1{,}672.10^{-27}$ Kg ,and Quark masses $\mathbf{m_u} = \mathbf{m_d} = m_p/3 = 5{,}573.10^{-28}$ 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 Proton **Resonance mass** $M_T = \frac{m_p}{9} = 1{,}857777.10^{-28}$ Kg ≈ 16,7267mEv/c² …….(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 axial .

Electron-Charge $\mathbf{C_e} = 1{,}602.10^{-19}$ C , while $\mathbf{C_{qu}} = \frac{2}{3}e = +\frac{2}{3}1{,}602.10^{-19}$ C

$\mathbf{C_{qd}} = -\frac{1}{3}e = -\frac{1}{3}1{,}602.10^{-19}$ C , and from

$Q_T \equiv 2.q_u + q_d$, then Proton **Resonance charge** $Q_T = \frac{3.q_p}{3} = 1{,}602.10^{-19}$ C ….(c)

Proton-**Resonance frequency** $f_p = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}} = \sqrt[4]{\frac{1}{4\pi^2 5{,}573.10^{-28}(8{,}4.10^{-16})^3}} = 5{,}26241.10^{17}$ H

Using the United Newton-Coulomb **Electro-Mechanical** Equation , $q\bar{B}_L = 2\pi.m\ f$ **,** the Proton **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

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

$\mathbf{F_{ud-p}} = C\frac{q_1.q_2}{r^2} = 8{,}9875.10^9(Nm2/c^2).\frac{2}{9}[1{,}602.10^{-19}\ C]^2\frac{1}{(10^{-16})^2} = 1{,}997222.10^6$ N ...(F p)

and The **Electric Force** between the **u**-Quarks and **d**-Quarks in Neutron is

$\mathbf{F_{ud-n}} = C\frac{q_1.q_2}{r^2} = 8{,}9875.10^9(Nm2/c^2).\frac{2}{9}[1{,}602.10^{-19}\ C]^2\frac{1}{(10^{-16})^2} = -1{,}997222.10^6$ N ..(F n)

i.e. **Forces between** the **Opposites Equilibrium-Linearly** ←[d-u-d]→ **or** →[u-d-u]←

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 Dynamic-Strip-Polygon doesn`t close .

Remarks :

1.. Gravitational force $G \equiv \boldsymbol{\sigma}\ A \equiv [\frac{2\pi rf}{\Phi}]\ A \equiv \bar{v}\ [\frac{A}{\Phi}] \equiv \sigma.\Phi^3 \equiv \Phi^2\ .\ [\{\sigma\ \Phi\}] \equiv$

$G \equiv \Phi^2.\ [\{\sigma\ \Phi\} \equiv 2\pi f_P\ r \equiv w\ r \equiv \bar{v} \equiv m\ g = \bar{c} = \frac{2.B}{\pi r^3}\ ] \rightarrow$ i.e. **G**

is Related to → motion≡ work W , Spaces r , Anti-Spaces 1/r , Stresses σ , Areas A , Caves a ,
→ Periods T , Frequencies f , Angular-waves w , Angular-Momentum B ,
→ Spin B ≡ S , velocities v , Light-velocity c , Impedances Z_n, Masses m ,
→ Gravity $\bar{g}$, Charges , $\bar{q}$, Electromagnetic - Fields $\bar{E}$, $\bar{M}$, Hydrogen H ,
→ Atoms , Molecules , Golden-Ratio Φ , All-Universe . Markos 9/4/2020.

4f.. The Energy in caves of The-Primary-Particles :

The Total - Energy of an Elementary-Particle ≡ Intrinsic Rotational + Kinetic Energy ,

From rotational Energy B = r m v = S = Spin then , $m = \frac{B}{r.v} = \frac{B}{r.wr} = \frac{B}{r^2.w} = \frac{S}{r^2.w}$ .....(1)

Centripetal-Energy $E_K = \frac{m}{r}v^2 = \frac{v^2}{r}[\frac{S}{r^2.w}] = \frac{w^2r^2.S}{r.r^2.w} = \frac{w.S}{r} = \frac{\mathbf{2\pi f.S}}{\mathbf{r}} \equiv \frac{\mathbf{c.S}}{\mathbf{r^2}}$ …..(**2**)

From Unit-Area-Energy $f^2.a^3 = \pi$, then $f = \sqrt[2]{\frac{\pi}{a^3}}$ ...(3) and $E_K = \sqrt[2]{\frac{\pi}{a^3}}.\frac{2\pi S}{r} \equiv \sqrt[2]{\frac{\boldsymbol{\pi^3}}{\mathbf{a^3}}}.\frac{\mathbf{2S}}{\mathbf{r}}$ ...(**4**)

and or Energy from caves → $E_K = \frac{\mathbf{k}}{\mathbf{r}} + \frac{\mathbf{L^2}}{\mathbf{2m\ r^2}} = \frac{\mathbf{k}}{\mathbf{r}} + \frac{\mathbf{L^2}}{\mathbf{2(\frac{S}{r^2.w})\ r^2}} = \frac{\boldsymbol{\pi}}{\mathbf{r}} + \{\frac{\mathbf{Sw}}{\mathbf{2}} = \frac{\mathbf{cS}}{\mathbf{2r}}\} = \frac{\boldsymbol{\pi}}{\mathbf{r}} + \frac{\mathbf{cS}}{\mathbf{2r}}$ ...(**5**)

1.. **Neutrinos** ,**v**, **m** =(3,11 .10^{-6})MeV/c^2 x 1,8.10^{-28} = **5 ,598 .10^{-34}** Kg

The Spin is , $\mathbf{S_\nu} = 5{,}691952.10^{-34}$ {Kg/m/s}, $\mathbf{a_v} = 7{,}0.10^{-21}$ m , $\mathbf{f_v} = [\mathbf{E_{vK} = mc^2]\ /\ h} =$ **5,6**.10^{-34} [10^{17}].1,6022.10^{-19} = 8,96912.10^{-36} J / [6,626.10^{-34} Js = **13,536244. 10^1/ s**

From cave r = 7.10^{-21} m and f = $\sqrt[2]{\frac{1}{g.a^3}} = \sqrt[2]{\frac{9{,}8078}{(7.10^{-21})^3}} = 5{,}347345.10^{30}$ H then ,

$\mathbf{E_{vK}}$ = h. $\mathbf{f_v}$ = 6,62607.10^{-34}J s.[5,347.10^{30}] / (1,6022.10^{-19} eV) = **2,2114518.10^{14}**eV

Using $\mathbf{E_{vK}} = \frac{\mathbf{k}}{\mathbf{r}} + \frac{\mathbf{cS^2}}{\mathbf{2m.r^2}} = \frac{36.10^{-20}}{7{,}10^{-21}} + \frac{3.10^8(5{,}691952.10^{-34})^2}{2.3{,}922.10^{-36}[7{,}0.10^{-21}]^2} = 51{,}428$ eV+ 2,528774.10^{17}eV

= 252,8774 , [10^{15}] TeV → The Total Energy of the Sun striking Earth-face per second.

2… **Electron** , **e** , $m_e = 0$, 511MeV = 0, 511.10^{-6} eV . [1,80. 10^{-27}] = 9,198.10^{-34} Kg

$\mathbf{a_e}$ = 5,0.10^{-18} m , Charge $\mathbf{C_e}$ =1,602.10^{-19} C , Spin $\mathbf{S_e} = \frac{\mathbf{S}}{\mathbf{2}}$ =2,845976.10^{-34} {Kg/m/s},

From cave r = 5.10^{-18} m and f = $\sqrt[2]{\frac{g}{a^3}} = \sqrt[2]{\frac{9{,}8078}{(5.10^{-18})^3}} = 2{,}801114.10^{26}$ H then ,

Using $\mathbf{E_{eK}} = \frac{\mathbf{k}}{\mathbf{r}} + \frac{\mathbf{cS^2}}{\mathbf{2m.r^2}} = \frac{36.10^{-20}}{7{,}10^{-18}} + \frac{3.10^8(5{,}691952.10^{-34})^2}{2.9{,}198.10^{-34}[5.10^{-18}]^2} = 51{,}428$ eV + 2,111843.10^{10} J

= 51,43 eV+ 1,32 .10^{29} eV → The Energy of 133 gr to fall 1 meter against gravity.

3.. **Gamma-ray** , γ, is the **Photon-Energy** $E = \bar{c}\ [\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}] \equiv \bar{v}\ .[\ \boxed{\bar{f}_n}\ + f_n\ ]$,with Spin =1

and is an **Energy-Storage S** ≡ $\boxed{[\oplus \leftarrow \mathbf{r} \rightarrow \ominus]}$ ≡ **Particle [$\bar{v}$.** $\boxed{\bar{f}_n}$ **]** → [$\bar{\mathbf{v}} = \bar{\mathbf{c}} = \lambda\frac{f}{\Phi}$] → and is

an Stationary-Standing-Wave → [S≡ [EM-R ≡ $f_{1=N}$,f_2 ,f_D ,f_n= w^2] =2.(2r).c.sin 2[φ ≡ $\frac{\bar{B}}{\Phi}$]

2.. Energy-Motion M ≡ $\boxed{\bar{\mathbf{v}} - \mathbf{Vector}}$ ≡ **Wave** [$\bar{\mathbf{v}}\ .\mathbf{f_n}$] ≡ [$\mathbf{f_1}$= (E^2+H^2) = $n\frac{\Phi.\sigma}{2\pi r} = \frac{n\ \bar{B}}{\pi^2 r^4}$]

i.e. **a Propagating Wave** $\{W \equiv \text{EM-R} \equiv [\varepsilon E^2 + \mu B^2] = 2.\lambda c.\ \sin 2[\varphi \equiv \frac{\bar{B}}{\Phi}]\}$

Energy under Planck-scale $\mathbf{E = [\ \Phi \frac{\sigma}{4\pi r}\ ]\ .\ \bar{B} \equiv \frac{|B|^2}{2\pi^2 r^4}}$ where $B_p = 5{,}691952.10^{-34}\{Kg/m/s\}$,

$\bar{q}_{\text{Photon}} = \frac{G}{\sqrt{2}.f} = \frac{G.h}{\sqrt{2}.E} = \frac{[6{,}6736923\ .10^{-11}].[6{,}62606957.10^{-34}]}{\sqrt{2}\ .E=1} = 3{,}127\ 10^{-44}$ C . i.e.

The Energy in Photon is **Dependent** on Gravitational **G** and frequency $\mathbf{f_p}$ **of Storages** .

Issues → $1eV=1{,}6022.10^{-19}$ J ← 10^3eV = $1{,}6022.10^{-16}$ J ,10^6eV =$1{,}6022.10^{-13}$ J , 10^7eV =$1{,}6022.10^{-12}$ J ,10^9eV =$1{,}6022.10^{-10}$ J , 10^{12}eV =$1{,}6022.10^{-7}$ J and from **f = E / h** then ,

$f_{1eV} = 1{,}6022.10^{-19}$ 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 $f_e = \sqrt[2]{\frac{1}{a^3}}$

Voltage V= $\frac{h.f}{q} = \frac{h.c}{q.\lambda} = \frac{6{,}62606957.10^{-34}.2{,}9979.10^8}{1{,}602..10^{-19}.\lambda}$= $\mathbf{12{,}3983.10^{-7}[\frac{1}{\lambda}]\ eV}$ =12,398 eV for $\lambda=10^{-7}$m

or $\mathbf{V = \frac{h.f}{q}} = \frac{6{,}62606957.10^{-34}}{1{,}602..10^{-19}C}\ \sqrt[2]{\frac{1}{a^3}} = 4{,}1361232.10^{-15}.\sqrt[2]{\frac{1}{a^3}}$ eV =$4{,}1361232.10^{-15}\sqrt[2]{\frac{1}{10^{-21}}}$ = **12,398eV**

i.e. The Voltage $V = \frac{E}{q} = \frac{q}{C} = L\frac{di}{dt} = R\ i$, $\mathbf{i = \frac{di}{dt}}$, of a cave , **a** , is dependent on inverse **a** , since $\lambda = 2a$.

In cave10^{-13} m exists min-energy ,and from $\mathbf{g = f^2_n a^3}$, or $f_\gamma = \sqrt[2]{\frac{g}{a^3}} = \sqrt[2]{\frac{9{,}807}{10^{-39}}}$ = $9{,}903.10^{19}$ H

Max-Energy is $\mathbf{E = h\ f_\gamma}$ =$6{,}62606957.\ 10^{-34}.9{,}903.10^{19}/1{,}6.10^{-19}$ = **4 , 095543 .10 ^{5} eV**

Since **G** Effects on $\bar{\mathbf{c}}$ velocity through eq. → E = h $\mathbf{f_\gamma}$ = $\bar{c}$.[$\boxed{\bar{f}_n}$ + f_n] then $\mathbf{[\ \boxed{\bar{f}_n} + f_n\ ] = \frac{E}{\bar{c}} = f_\gamma}$

or Energy $\bar{\mathbf{E}}_{\text{Photon = 1,eV}}$ = **12,4 eV+1,6.10^{-16} eV** and for E 10^n eV , then Photon-Energy

is $\bar{\mathbf{E}}_{\text{Photon = n,eV}}$ = **12,4 eV + 1,6. 10 $^{[\,n-16\,]}$ eV** ……(n eV)

Gamma-ray ,**γ**, is the minimum Energy = $2{,}77344.10^{-14}$ eV and in the Smallest acceleration Space , or in cave $a_\gamma = 1.10^{-13}$ m where issues $f_\gamma = 5, 6.10^{19}$ H.

X-ray , X , is of $\bar{\mathbf{E}}_{\text{Photon =2,eV}}$ = $5{,}203.10^{[-14]}$ eV , $\mathbf{f_x}$ = $5{,}605.10^{19}$ H and $\mathbf{a_x}$ =1.10^{-14} m

From above is seen the How **Duality-Photon-Energy** is working , E = $\bar{c}$.[$\boxed{\bar{f}_n}$ + f_n] and from

Stress → $\sigma = [\frac{2\pi r}{\Phi^2}]\ .f_n = [\frac{2\pi r}{\Phi^2}]\ .[\boxed{\bar{f}_n} + f_n] = \mathbf{[\frac{2\pi r}{\Phi^2}]\ .\boxed{\bar{f}_n}} + \mathbf{[\frac{2\pi r}{\Phi^2}].f_n}$ ≡ **Storage** + **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-Origination.

THE PHOTON`S ELECTROMAGNETIC - SPECTRUM :

Photon-ray , f_{ph} →[> $\mathbf{a_{ph}} = 1.10^{-13}$ m > $1.10^{-[14+n]}$ m , f_{ph} = $\mathbf{[\ \boxed{\bar{f}_n} + f_n\ ] = \frac{E}{\bar{c}} = f_\gamma}$

$\bar{\mathbf{E}}_{\text{Ph=n,eV}}$ = **12,4 eV+1,17444. 10 $^{[\,-n-16\,]}$ eV** , where n = 1 , 2 , 3 , … n

Gamma-ray ,γ→ [1.10^{-10} m>a_γ=1.10^{-12} m>$1.10^{-[14+n]}$ m , f_γ = $1{,}774.10^{19}$ H>$10^{19+n\infty}$

$\bar{\mathbf{E}}_{\gamma,eV}$ = **1,17444. 10 $^{[-14-16]}$ eV** , in 2r =10^{-12} m , $f_{\gamma R}$ → 10^{20} H

X-ray , X , → [1.10^{-8} m > $a_x = 1.10^{-9}$ m > 1.10^{-10} m , f_X = $1{,}774.10^{18}$ H ≅ 10^{18} H

$\bar{\mathbf{E}}_{X,eV}$ = **1,17444.10 $^{[-12-14]}$ eV** , in 2r =10^{-10} m , f_{xR} → 10^{18} H

Ultraviolet , → [1.10^{-6} m > $a_x = 1.10^{-8}$ m > 1.10^{-10} m , f_X = $1{,}774.10^{17}$ H. ≅ 10^{17} H

$\bar{\mathbf{E}}_{X,eV}$ = **1,17444. 10 $^{[-10-12]}$ eV** , in 2r =10^{-8} m , $f_{\gamma R}$ → 10^{16} H

i.e. Electromagnetic-Spectrum ≡ 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 **Dynamic-Strip-Polygon** closes **Linearly** .This Property issues on Markos [STPL] **Six-Triple-Points-Line** where **Spaces and Anti-Spaces Equilibrium** [91] .

SUMMARY :

1… Force **G** , **Gravitational-Constant-Force G , becomes as Stress** ≡ Force/Area ≡ **g** , as equation $G = gk_E = g\ .[g_E\ k_E] = [\frac{T^2 P}{a^3}].[g_L\ k_L] = [\frac{c.r^3}{a^3}].[g_L\ k_L] = 9{,}8076925 * 6{,}8116.10^{-12} \equiv 6{,}68056.10^{-11}\ \frac{m^3}{Ns^2}$, and **Effects on Gravity** - **Stress** → $\mathbf{g} \equiv 9{,}8076925\ \frac{Kg}{cm^2}$ [73] . From the Beyond-Planck-length force $\mathbf{F = \sigma\ .\ A}$ =The Glue-Bond ≡ Stress x Area ≡ $[\frac{2\pi f.r}{\Phi}].A = w\ r.[\frac{A}{\Phi}] = \bar{v}\ [\frac{A}{\Phi}]$,then $F = G = \sigma A = [\frac{2\pi r f}{\Phi}].A = \bar{v}\ [\frac{A}{\Phi}] \equiv \sigma.\Phi^3 \equiv \Phi^2.[\{\sigma\ \Phi\} \equiv 2\pi f_P\ r \equiv \frac{2B}{\pi r^3} \equiv w\ r \equiv \bar{v} \equiv m\ g = \bar{c}]$

i.e. Force **G** is **converted** from an axial force $\bar{F}$ ≡ motion , on a Surface A ≡ Space , to Stress $\boldsymbol{\sigma}$, in a cave - **r** as frequency $\mathbf{f_P}$ and as Angular-velocity $\bar{\mathbf{w}}$ and Angular-momentum $\bar{B}$, everywhere as velocity $\bar{\mathbf{v}}$ and in Planck-scale-Length P_L , as light-velocity $\bar{\mathbf{c}}$ and Gravity

$\bar{\mathbf{g}}$. Because velocity $\bar{\mathbf{c}}$ carries the motion in Photon-Boxes and every where , and Photons , are related to **G** through stresses $\boldsymbol{\sigma}$, $G = \sigma.\Phi^3 = [\sigma.\Phi]\Phi^2 = [2\pi r.\ f]\ \Phi^2 = [2\pi\Phi^2]\ r\ f$, carries also the **Golden-ratio-Pattern** in all microcosm and macrocosm as $\rightarrow \boldsymbol{\sigma} = [\frac{2\pi r}{\Phi^2}]\ .\ \mathbf{f_n}$

2…Dual-Photon $\bar{\mathbf{v}} = \bar{\mathbf{c}}.[\boxed{\bar{f}_n} + \mathbf{f_n}]$, is **Particle + Wave ≡ Energy** moving with light-velocity and its Duality exists in frequency . The Material-Points travel with velocities $\mathbf{n}.\bar{\mathbf{c}}$, and are as $\bar{\mathbf{v}}_\mathbf{m} = n.\bar{c}.\{\boxed{\bar{f}_n} + f_n\} \equiv [\frac{G}{\Phi^3 L_P}]\{\boxed{\bar{f}_n} + f_n\}$, where $\boxed{\bar{f}_n}$ is the Stationary Storage and $[f_n]$ Travels as an Propagating Electromagnetic-Radiation where motion ≡ Energy ≡ Wave as Electric-Force and is altered to the , Space ≡ Magnetic force as $\bar{\mathbf{E}} = \bar{\mathbf{B}}\ c$.
Since $G \equiv \sigma.\Phi^3 \equiv \Phi^2\ [\ \bar{c}\ ]$ then → The only **Force** creating velocities is Force - **G** .

3...Light Velocity $\bar{\mathbf{v}} = \bar{\mathbf{c}} = \frac{F\Phi}{A} = [\frac{G\Phi}{A=b}] = [\frac{6{,}673692.10^{-11}.1{,}6180339887}{36.10^{-20}.}] = 2.9995163.\ 10^8$ m/s
And is a Constant-Light-velocity $\bar{\mathbf{c}} = \frac{G}{\Phi^3 L_P}$, because all constituents are constant.
Since $G \equiv \sigma.\Phi^3 \equiv \Phi^2\ [\ \bar{c}\ ]$ then → The only **Force** creating velocities in loops is **G .**

4…Gravity $\bar{\mathbf{g}}$. The **Light velocity vector** $\bar{\mathbf{v}} = \bar{\mathbf{c}}$ is **Acting on cave** , $\mathbf{r} = \mathbf{L_P}$, and finding **Impedance** $\mathbf{m_g}$, becomes the **Centrifugal-Force** $\mathbf{F_g}$ of the **Cave** and it is Equal to the **Gravity g ,** as **Gravity** $\rightarrow \bar{\mathbf{g}} = \mathbf{4}\sqrt{\mathbf{3}}\ \mathbf{ln(3)}\ .\ \boldsymbol{\pi}^2\ \mathbf{L_P}\ \mathbf{c}^4 = 9$, 8076754 m/s
Since $G \equiv \sigma.\Phi^3 \equiv \Phi^2\ [\ \mathbf{m}\ \bar{\mathbf{g}}\ ]$ then→ The only **Force** creating Gravity and masses is **G** .

5…Hydrogen cave **H** . The **Light velocity vector** $\bar{v} = \bar{c}$ acting on **an-cave** , $\mathbf{r} \neq L_P$, finds The-Impedance $\mathbf{Z_c}$ from Velocity $\bar{\mathbf{c}}$, and becomes the minimum-Energy - cave in L_P , equal to $\mathbf{E} \equiv \mathbf{r}\ \mathbf{Z_c}\ \bar{\mathbf{c}} \equiv \mathbf{h}$, and is the Hydrogen cave $L_H = \mathbf{r} = \frac{\mathbf{h}}{\mathbf{c}.\mathbf{Z_c}} = 2{,}1127839.10^{-11}$ m which is the min-cave in Planck`s - length with the max-Energy **h .** From the Unit-Stress-Gravity **g** as $k = E = \frac{T^2}{r^3} = g = \frac{1}{f^2.\ r^3}$, then $g\ r^3.\mathbf{f}^2_\mathbf{p} = 1$, which is the Kepler second and constant Unit-law for areas , and in this min - L_H frequency $\mathbf{f} = 3{,}2839982.10^{15}$ H , which is the Hydrogen cave occupying Energy → $\mathbf{E} = \mathbf{h\ f} = 13$, 6 eV . =
Since $G \equiv \sigma.\Phi^3 \equiv \Phi^2\ [v = w\ r]$ then→ The only **Force** creating Caves and Periods is **G** .

6…Electron cave **e** . The Natural-frequency **f** in Planck`s length for the **Primary-Particle** occupying the less **Negative-charge-frequency**, is the **Electron** ,and is from equation solution $\frac{\mathbf{w_n}}{\mathbf{2\pi}} = \mathbf{f_e} = \frac{1}{2\pi}\sqrt{\frac{k}{m}}$, or $4\ \pi^2\ f^2_e.m_e = \mathbf{k} = \boldsymbol{\pi}\ \mathbf{g}$ and $\mathbf{m_e} = \frac{\mathbf{g}}{\mathbf{4\ \pi\ f^2_e}}$, where $\mathbf{f}_\mathbf{e} = 3{,}283998.10^{15}$/s , Light velocity **c** , is acting on **Electron-Unit-Charge** $\bar{\mathbf{q}}$ ← or , $\mathbf{G} = \mathbf{c}\ \sqrt{\mathbf{2}}\ \bar{\mathbf{q}}$, and then **Electron-Charge** is $\bar{\mathbf{q}}_{\text{Electron}} = \frac{G}{c\sqrt{2}} = 1{,}574.10^{-19}$ C .
Since $G \equiv \sigma.\Phi^3 \equiv \Phi^2\ [\sigma\ \Phi]$ then→ The only **Force** creating velocities and Charges is **G** .

7… Electromagnetism $\bar{\mathbf{E}}$, $\bar{\mathbf{B}}$ 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 $E = \frac{1}{a^3}[\frac{4\pi^2}{c^2} + \frac{L^2}{2m}]$ where L = the Spin $S = 5{,}691952.\ 10^{-34}$ {Kg/m/s}.
Since $G \equiv \sigma.\Phi^3 \equiv \Phi^2\ [\frac{2S=B}{\pi r^3}]$ then → 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
Force $\mathbf{F_c} = C\ \frac{q_1.q_2}{r^2} = 8{,}9875.10^9 (Nm2/c^2).\frac{2}{9}[1{,}602.10^{-19}\ C]^2 \frac{1}{(10^{-15})^2} = \mathbf{51{,}25679\ N}$
x[1Nm = 6,2415. 10^{18} eV] = $\mathbf{3{,}1991925.10^{20}\ eV}$
Since $G \equiv \sigma.\Phi^3 \equiv \Phi^2\ [\frac{2\bar{B}_F}{\pi r^3}]$ then → 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 , $g.r^3.\mathbf{f}^2_\mathbf{p} = 1$, the frequency $\mathbf{f} = 3{,}2881322.10^{15}$ H , then the Hydrogen cave-Energy $\mathbf{L} = h.f_N = 6.62607.10^{-34}.3{,}2881322.10^{15}$ J /1,6.10^{-19} = 13,6 eV . In case of **1-Proton** [⊕] ≡ An **Ion-nucleus** , then Total-Harmonic-mass $M_T = 1{,}67.10^{-27}$Kg . 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 $\bar{B}_F = |\frac{2\pi.M_T}{Q_T}| f = 7{,}7929983.10^{7}$ Tesla which is → **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 $\mathbf{C_{qu}} = \frac{2}{3} e = + \frac{2}{3} 1{,}602.10^{-19}$ C , or $\mathbf{C_{qd}} = -\frac{1}{3} e = \frac{1}{3} 1{,}602.10^{-19}$ 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 $\mathbf{F_{u-d}} = C \frac{q_1.q_2}{r^2} = 1{,}9972.10^{-7}$ N , which is the Energy per **Proton** in CERN-LHC, 2015.

Since $G \equiv \sigma.\Phi^3 \equiv \Phi^2 [\frac{2\bar{B}_F}{\pi r^3}]$ then →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 $G \equiv \sigma.\Phi^3 \equiv \Phi^2. [\{\sigma\ \Phi\} \equiv [\frac{2B}{\pi r^3}] \equiv 2\pi f_p\, r \equiv w\, r \equiv \bar{v} \equiv m\, a = \bar{c}\ ]$

10...The Stationary Photon $\bar{v} .[\ \boxed{\bar{f}_n} + f_n\ ] \equiv |\frac{v}{\pi^2.r^4_n}|.\boxed{\bar{B}_n} + |\frac{v}{\pi^2.r^4_n}|\ f_n$ can use any of the two Storages , *frequencies* , by Placing the Storage $\boxed{\bar{f}_n} = \boxed{\bar{B}_n}$ = Energy = motion , anywhere needed to it and any time can travel with light-velocity . This Property of Photons will be the interest of Future-Technologies because Storage can be **Properly-Prepared**, issuing $F_{photon} = \frac{[\oplus<\rightarrow\leftarrow\ominus]}{r^2} = \frac{[\sigma.\sigma]}{r^2} = \left|\frac{\sigma.}{r}\right|^2 = \left|\frac{2\pi f.}{\Phi}\right|^2 = \left|\frac{w}{\Phi}\right|^2 = \left|\frac{2L}{\Phi\bar{B}}\right|^2 = \left|\frac{\bar{c}}{r.\Phi}\right|^2$, 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 → The Spectral-lines ← ***Split into*** **Multiple-closely-Spaced-lines** , because of the Released-Energy , $\boxed{\bar{f}_n}$, into Magnetic-Field , a Phenomenon happening such in Inorganic as in Organic Chemistry .

Because Photon is related to stress **σ** as , $\bar{v}\,[\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}\ ] \equiv \bar{v}.[\ \boxed{\bar{f}_n} + f_n\ ] = \bar{v}.[\frac{\sigma\,\Phi^2}{2\pi r}]$ and $\boldsymbol{\sigma} \equiv [\frac{2\pi r}{\Phi^2}] .f_n \equiv \frac{\mathbf{f_{ph}.2\pi.r}}{\boldsymbol{\Phi}^2} \equiv \frac{\mathbf{w.r}}{\boldsymbol{\Phi}^2} \equiv \frac{\mathbf{v}}{\boldsymbol{\Phi}^2} \equiv \bar{\mathbf{c}}\frac{\mathbf{1}}{\boldsymbol{\Phi}^2}$ **,** dependent on Position and velocity ,

It is a Way , of Information from , f_n , **and from Storage** , $\boxed{\bar{f}_n}$, **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 ⊕ Charge moves to the ⊖ Charge . From Voltage of cave r , $\mathbf{V_r} = \mathbf{C}\frac{q_1.q_2}{r}$ then → $\mathbf{V_r = F_c.r}$, or Interference [⊕ → ⊖]. 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 ± Charge ≡ |s| ≡ $|\bar{v}|^2$. [91]

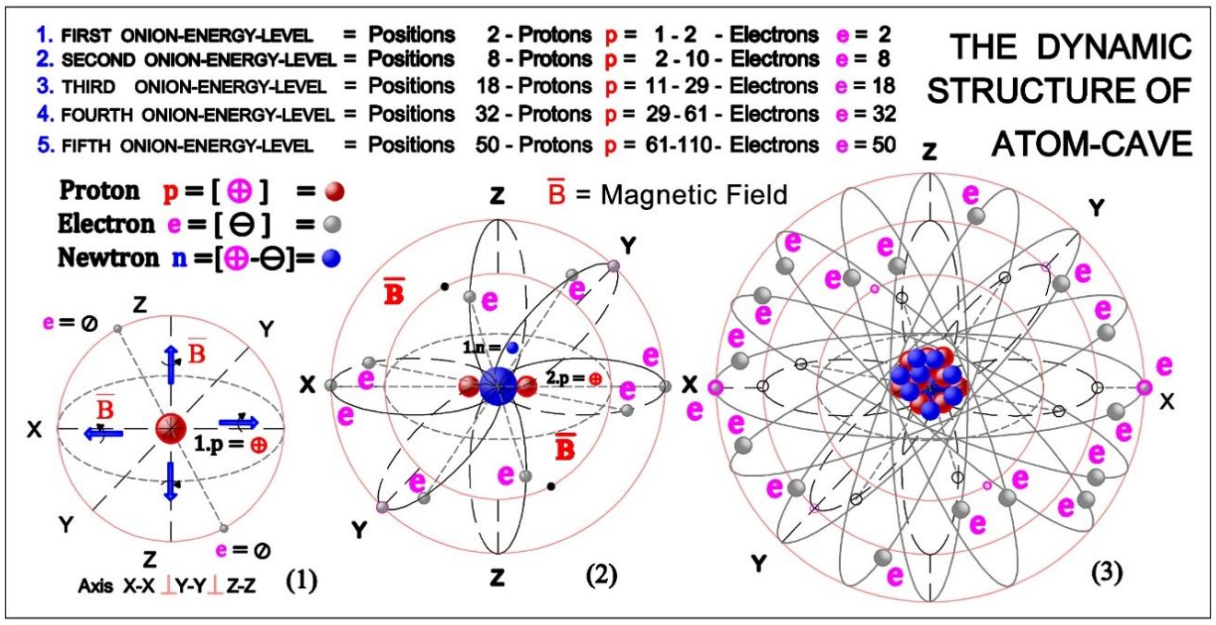


Figure-16- : The New **Energy-Atom-Cave Pattern** , In minimum Energy-Space , **p ↔ e** :

5f... The New Electromagnetic-Structure of Atom .

From the **Set of infinite Rest , [+] , [- +} or moving Units ≡ 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 $g.a^3.\mathbf{f}^2_{\mathbf{p}} = 1$ relation ,with the minimum Energy -13,6 eV .The Presence of a ***Proton-Positive-Charge*** $\bar{q}_p \equiv \oplus$ creates in cave **a** the UMF ≡**Uniform-Magnetic-Field** $\bar{B}_p$,[***The-Material-Space***] as equation $\bar{q}_p . \bar{B}_p = 2\pi.m_p.f_r$ which is the **Storage of Energy** in Hydrogen-Cave .
In this UMF , Charges $\bar{\mathbf{q}}$, Orbiting in a Plane Normal to $\bar{B}_p$, their cyclotron-frequency $\mathbf{f_n}$ is independent of the Particles-speed and radius allowing the acceleration of Charged Particles as are the , Electrons → $\bar{v}_e = 2\pi r. f_e$ and , Dual-Photons → $\{ \bar{c} . \boxed{\bar{f}_n} + \bar{c} . f_n \}$.

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 , $\bar{q}_e \equiv \frac{G}{c\sqrt{2}} = 1{,}59.10^{-19}$ C , then follows a **Complete-circle** ***The-Material-Space*** **is** $\bar{\mathbf{B}}_\mathbf{p}$,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 $\{ \bar{c} . \boxed{\bar{f}_n} + \bar{c} . f_n \}$, Storage + Energy allows The **Work** ≡ Energy produced by **Electrons** , be Stored in **Photons – Storages .**

3.. The Heap of Masses **m =** M_T follow Newton laws , The Charges $[\oplus, \pm \bar{\mathbf{q}}_\mathbf{p}, \ominus]$ follow the Coulomb law , The Zero-Electron Charges $[\oplus \leftrightarrow \ominus] \equiv \pm \mathbf{0}$ the Material-Geometry Rules , the Arrangements , ***Positions*** **n** , the Material-Geometry Rules of Combinations and Permutations as follows ,

a.. The **Three Elements** ≡ 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 , $P_1^2 = \mathbf{2}$, and these are the two as → $[\oplus,\ominus]$ and $[\ominus,\oplus]$. The number of **Permutation** with **Repetition** of the **Two** Elements in **n = 2** which is the Sub-Spaces as $\mathbf{P}^{\text{Moulds}}_{\text{Elements}} \equiv \mathbf{RP}^{2}_{1} \equiv 2$, 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** ≡ 2 Elements , A **Vector** ≡ 4 Elements , A **Plane** ≡ 6 Elements , A **Volume** ≡ 8 Elements , A **Space1volume** ≡ 10 Elements , A **Space2volume** ≡ 12 Elements , A **Space-n-volume** ≡ 2 n 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 $\mathbf{P}^{2}_{1}.\mathbf{RP}^{n}_{2} \equiv \mathbf{2\ n^2} \equiv$ **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 ≡ Energy .

e.. The number of **Permutation** of the **n-Spaces** and of Repetition in the **2-Sub-Spaces** of the **Two**-Elements [⊕ , ⊖] is equal to → $P\,^{2}_{1}.RP\,^{n}_{2} + P\,^{2}_{1}.RP\,^{n-1}_{2} + P\,^{2}_{1}.RP\,^{n-2}_{2}$ + ... ≡ 2 [n^2+(n-1)²+(n-2)²+..] , ***Onion Summation*** , $\sum_1^n [\frac{n(n+1)(2n+1)}{3}]$ = 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*** → **Proton** ≡ ⊕ ,**Electron** ≡ ⊖ , is **The-Energy-Part of Atom**, while Neutron ≡ [⊕↔⊖] , is **The-Space-Part of Atoms** as 0 ≡ [⊕← **r** →⊖] , 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, → consists the first , **3** , Perpendicular-Plane-Permitted-Positions in Cave , for the → **Lissajous – Eight - Shapes** . This happens because of the **Linear-Vibrations** [ẍ + w^2 x = 0] of **The three-masses** , which Occur on the Two **Perpendicular each other** , Line-Vectors of , **x ⊥ y** , in Plane above Shapes which are for ,

a.. Difference of Phase $d_\varphi = 90^0$ emission is → The Eight-Shapes □ .

b.. Difference of Phase $d_\varphi = 0^0$ emission is → The Ellipse-Shapes ∝ .

c.. Difference of Phase $d_\varphi = 45^0$ emission is → The Double-Saddle-Shapes . ∞ , ↺ .

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 ⊥ 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→ consists the Second **Onion Plane-Energy-Volume** , Enveloping the Priors , **Vector-Space-Cave** - m + Plane +Vector + Point + , Prior[ANOH] , and For the **n**-Proton [⊕] , **n**-Electron [⊖] , **n**-Neutron [⊕↻↺⊖] , 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 [14x2] = **28-*Nucleus-masses*** of **11- *Charges*** and $2m^2$ =18 Permitted-Orbit-Positions , per 2 Electrons for Stability→ 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 $\mathbf{P\,^{2}_{1}.RP\,^{n}_{2} \equiv 2\ n^2}$,→ 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 $\mathbf{2m^2}$ Permitted-Orbit-Positions , per 2 Electrons for Stability, and consists the { **m^{th} -Onion-Space-Energy-Volume -Cave },** enveloping all the Priors → Volume + Plane +Vector + Point+, P- [ANOH] ← with the **Three-Elements Space** ⊕ , **Anti-Space** ⊖ , **Material-Point** [⊕← **r** →⊖] , 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 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 2φ.[$\varphi = \frac{\bar{B}}{\Phi}$] 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*

→ { [εE^2+μB^2] = 2.λc.sin.2φ.[$\varphi = \frac{\bar{B}}{\Phi}$] } ← *where* **Particle** 2r = n λ , **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

which Duality-Photon-velocity is $\bar{\mathbf{v}} \equiv \bar{\mathbf{c}} .[\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}] \equiv \bar{\mathbf{c}} .[\ \boxed{\bar{f}_n} + \mathbf{f_n}\ ]$ ……(f-v)

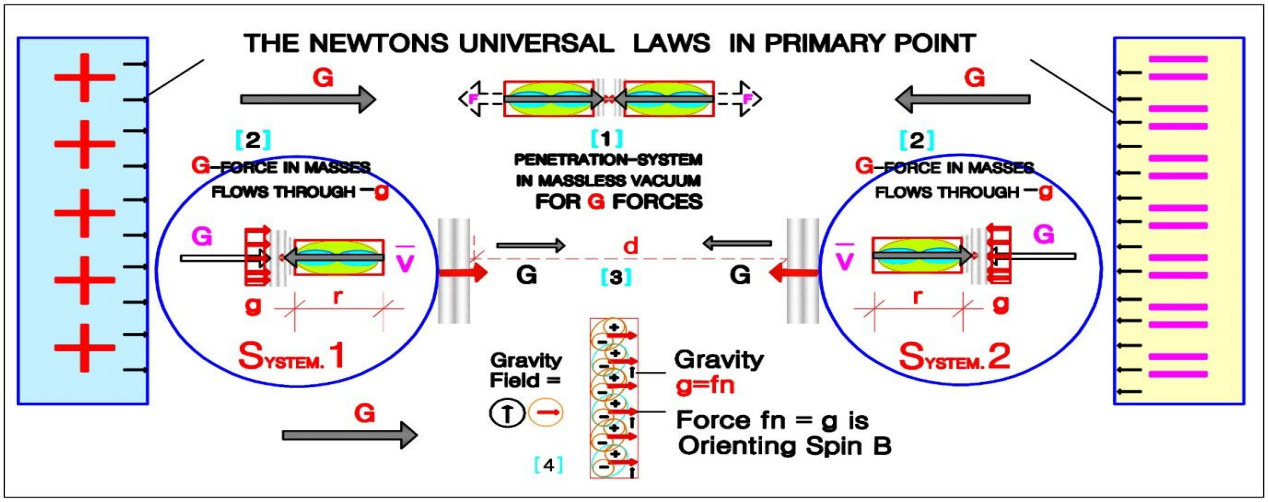
From Force-relation $G = \sigma A = (2\pi f\, r)\frac{A}{\Phi} = w\, r = \bar{\mathbf{c}} .\frac{A}{\Phi}$, i.e. Action of $G \rightarrow$ on $\bar{\mathbf{c}}$ and , following relation $\boldsymbol{\sigma\ x\ \Phi^3 \equiv G}$, from Energy-force F_g in , $r = L_P$, Planck`s scale of mass $m_g = J.w^2$, 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

$$\mathbf{F_g = \bar{g}} = m_g [\frac{c^2}{r}] = m_g [\frac{c^2}{r}] = J\, w^2.\frac{c^2}{r}.g_Z = [\frac{\pi r^4}{2}].[\frac{c}{r}]^2.[\frac{c^2}{r}].2^3.\ln(3).\pi\sqrt{3}\ \} =$$

$$\mathbf{4\sqrt{3}\,.\ln 3\,.\pi^2 r c^4} = \mathbf{9{,}8076754}\ \text{m/s}$$, which is a Force acting on $r = L_P$ mass .

i.e. Gravity $\bar{\mathbf{g}}$, Is The effection of **G** Force , on light-velocity $\bar{\mathbf{c}}$, In the 3-Dimensional Impedance of Space ln(3) and Anti-Space $\pi\sqrt{3}$ in $\mathbf{2^3}$, Planck-length $\mathbf{L_P = r}$, ……..(g)

A wide analysis of what is Impedance in Propagating-Photon $\bar{\mathbf{v}} = \lambda_n.f_n = \bar{c}.[\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}]$ = Energy = $\bar{\mathbf{c}}\,.\,\boxed{\bar{\mathbf{f}}_\mathbf{n}} + \bar{\mathbf{c}}\,.\,\mathbf{f_n} \equiv \bar{v}\,.\,\{\ \boxed{\bar{f}_n} + f_n\ \} \equiv |\frac{v}{\pi^2 r^4_n}|.\boxed{\bar{B}_n} + |\ \bar{c}\ |\ f_n$ ≡ Particle + Wave , as



in Material-Geometry [57-58] .

G … THE GRAVITATION CONSTANT G .

1g.. The Gravitation Constant G and Photon :

Figure – 17. The Newton`s Universal Laws in **Primary-Material-Points** :
Above , is consisted of Two-Primary-Opposite-Spaces ,{+}→ ←{-},The Poles with Infinite points for Parallel-lines such that **G** is a **Uniform- Pointy–Force**. The STPL - Mechanism is for constructing the Elementary Particles while the Material - Point , Photon and Photon - Charge , Light velocity c , Gravity g , Electrons e and e– Charge , Hydrogen cave by the Gravitational constant G .

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 Work equation , **W = F.ds** , where ds = the displacement |AB| . This right definition automatically defines that All this work in universe , ***which is Space and Energy*** , has been produced by this Unique force **G** only .

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

It was prior proved , that one of the smallest **Energy-Unit of Space** is that of Planck`s length , and **is an Energy-cave** , and this because from (s) Space s = 0 and Type-k = 1. Energy which is motion is kept in Massive-Box-B_P called **Photon** or ***Energy-Storage*** .

The velocity of Photon is $\bar{\mathbf{v}}\,.\,[\ \frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}\ ] \equiv \bar{\mathbf{v}}\,.\,[\ \boxed{\bar{\mathbf{f}}_\mathbf{n}} + \mathbf{f_n}\ ]$, i.e. a Dual motion as ,

1.. Energy-Storage $\mathbf{S} \equiv \boxed{[\oplus \leftarrow \mathbf{r} \rightarrow \ominus]}$ **≡ Particle** $[\bar{\mathbf{v}}\,.\,\boxed{\bar{\mathbf{f}}_\mathbf{n}}\ ] \rightarrow [\bar{\mathbf{v}} = \bar{\mathbf{c}} = \lambda\frac{f}{\Phi}] \rightarrow$ i.e. **a Stationary Standing - Wave** → $[S \equiv [\text{ EM-R} \equiv f_{1=N}, f_2, f_3, f_D, , f_n = w^2]$.

2.. Energy-Motion M ≡ $\boxed{\bar{\mathbf{v}}\ -\ \textbf{Vector}}$ **≡ Wave** $[\ \bar{\mathbf{v}}\,.\,\mathbf{f_n}\ ] \equiv [\ \mathbf{f_1} = (E^2+H^2) = n\frac{\Phi.\sigma}{2\pi r}$

$= \frac{\bar{B}}{\pi^2 r^4}\ ] \rightarrow$ i.e. **a Propagating Wave** $\{W \equiv \text{EM-R} \equiv [\varepsilon E^2 + \mu B^2] = 2.\lambda c.\sin.2\varphi[\varphi = \frac{\bar{B}}{\Phi}]\}$.

In both cases carry the in Box , Golden-ratio-frequency Φ ,
Everywhere and Anywhere such in microcosm and as in macrocosm.

Gravitational force **G** , in order to communicate with another velocity-vector $\bar{\mathbf{v}}$ which is axial also , ***is needed to Have a Reaction to this motion*** , i.e. Gravitational-Energy **G** is acting on Stress $\mathbf{g} \rightarrow \bar{\mathbf{g}}$, through the Waves $f_n \rightarrow$ [on Material-Point Unit Spin $\mathbf{S} \approx \mathbf{g}$] . Force **G** ***is Spread in a Layer***–a ***Field*** which is the Stable –Ocean - Spins **S** , becoming from the *Periodic motion* , and thus Communicates through stress $\mathbf{g}$ on Spins $\bar{\mathbf{S}}$ as Stress in all inter .

It was proved that The **Electron-Spin** is → $\mathbf{S/2 = 1\ ,\ 4603748.\ 10^{-34}}$ Joules ← 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* , ⊕ or ⊖ , which produces an Electric - field $\overleftarrow{\mathbf{E}}$, which exerts a force $\overleftarrow{\mathbf{F}}$ on other charged Particles $\overleftarrow{\mathbf{e}}$. Positive charges $+\overleftarrow{\mathbf{e}}$ accelerate in the ← Direction of the Field $\overleftarrow{\mathbf{E}}$. and Negative charges $-\overleftarrow{\mathbf{e}}$ accelerate in the Opposite → Direction to that of the field $\overleftarrow{\mathbf{E}}$.

2.. **A moving Charged-Particle** , ⊕ or ⊖ , produces a Magnetic-field $\overleftarrow{\mathbf{B}}$, which exerts a Force $\overleftarrow{\mathbf{F}}$ on other moving charges $\overleftarrow{\mathbf{e}}$. The Force $\overleftarrow{\mathbf{F}}$ of these charges is always , ⊥ , perpendicular to the Direction of their Velocity-vector, therefore the *Velocity-magnitude* does not change , and the *Direction* only of the Velocity-vector changes .

3.. **An accelerated-Charged-Particle** , $\overrightarrow{\oplus}$, produces an Electro-Magnetic-Wave $\overleftarrow{\mathbf{E}} \perp \overleftarrow{\mathbf{B}}$ *Perpendicular each other*, which are Electric and Magnetic fields travelling through empty Space with the speed of light , **c** , and which is as a Charged - Particle oscillating about an fixed equilibrium Position . This oscillation frequency , f , is the same to the E-M-Wave and which wavelength is $\lambda = c / f = c\ T$. 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 at the Two nodes of the wavelength

4.. **Accelerated-Charges** produce , *Changing Electric and Magnetic-fields alternately* ,which leads to the Propagating-Electromagnetic-Waves . In Zero-Periodic-motion $\{\oplus \rightarrow \mathbf{d} \leftarrow \ominus\} = 0$ of a Distance , **d** , the motion as Pressure CANNOT act instantly between the two Stationary constitutes , unless a Mean , **d** , is mediated to transfer the Pressure of the ⊕ constituent , to the ⊖ constituent . This Mean is a Stationary-Primary-Material-Point [⊕↔⊖] which is a **Standing-Wave-structure** becoming from {⊕ ,⊖} Charges at the **Two nodes** of the cave`s wavelength , Producing an ***Constructive wave - interference*** , ⊕ ↔ ⊕ , or , ⊖↔⊖ , and or Producing an ***Destructive wave - interference*** $\{\oplus \rightarrow \mathbf{d} \leftarrow \ominus\}$ where d ≡ the nodes distance in wavelength $\lambda = c / f$. Because ⊕ charge exerts a Force against ⊖ charge with Zero-Periodic motion and which two constituents equidistant , d = n.[⊕<→←⊖] , n = 1,2 …r , then the two Charges create an Electric and an Magnetic field Perpendicular each other ↑↔↓ 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** from the **Infinite-Dipole-Opposite-Primary – Charges which is THE-ENERGY- PART** , of the Two-Primary-Points $\overrightarrow{\oplus}$ to $\overrightarrow{\ominus}$, [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 ,** ***the Duality-Photons*** , $\bar{v} . [\boxed{\bar{f}_n} + f_n] \equiv | \frac{\mathbf{v}}{\boldsymbol{\pi}^2 . \mathbf{r}^4_{\mathbf{n}}} | . \boxed{\bar{B}_n} + | \bar{c} | f_n$,

The condition for **Irrotational Energy** is → $\nabla x\bar{B} = \nabla x\bar{S} = 0$, or $\nabla x\bar{B} = \nabla \bar{r} + 2\pi\ mf.\bar{a} = 0$, and $\bar{\mathbf{r}} = \pm\ 2\pi.m.f.\bar{\mathbf{a}}$. Vector $\bar{r}$, occupies Both directions for Rotational - equilibrium , **i.e. The vector** $\bar{\mathbf{r}} = \pm\ \bar{\mathbf{B}} \equiv \bar{S}_n = 2\pi m \mathbf{f_n}$, and $\mathbf{f_n} = \frac{B}{2\pi\ m_e} = \frac{E}{h}$, **is the Stationary-Filling-Ocean of the Spinning-Gravity-Material Point , in the called Empty-Space** ,with frequency that of Material-Point → $f_n = n.f_1 = \frac{E}{h} = \frac{n.v}{2\pi r} = \frac{n\sigma}{4\pi r}\ [1+\sqrt{5}\ ]$, and from $v = w\ r = 2\pi f\ r$, then $\mathbf{f_n} = v / 2\pi r = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\boldsymbol{\sigma . \Phi}}{\mathbf{2\pi . r_n}}$, where $\mathbf{v = \sigma\ .\Phi}$, and Spin $\mathbf{S_n} = \bar{\mathbf{B}} = J\ w = \boldsymbol{\pi^2 . r^4}\ . \mathbf{f_{n=e}}$

2g.. The Electron and Photon charges :

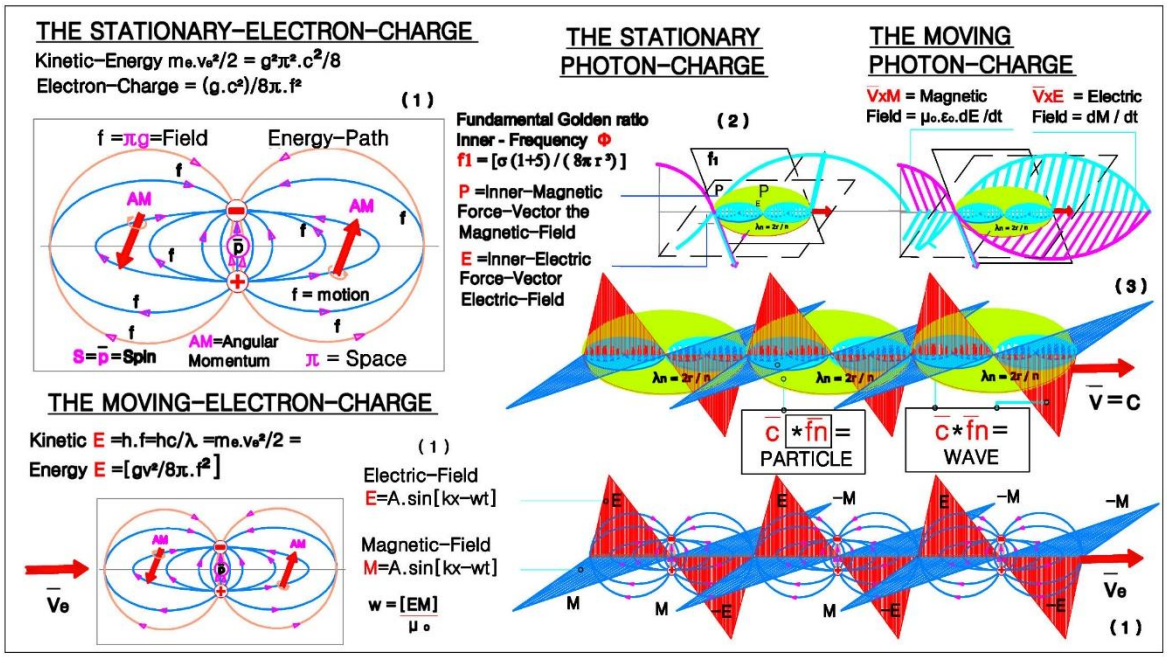


Figure 18. Conservation of **motion ≡ Energy** in the **Primary-Material-Point-Field-lines** :

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

Moving - Storage →$[\ \bar{v}\ .\ \boxed{\bar{f}_n}\ ]$← + Moving-Frequency → $[\ \bar{v}.\mathbf{f_n}\ ]$ ← ≡ 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 , $\mathbf{g\,.f^2.\,\pi^3 = 1}$, where $\boldsymbol{\pi}$ is the Closed Space , $\boldsymbol{\pi g}$ 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 , [{+} → {-}] , 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**] **<u>The-Stationary-Electron-Charge</u>**

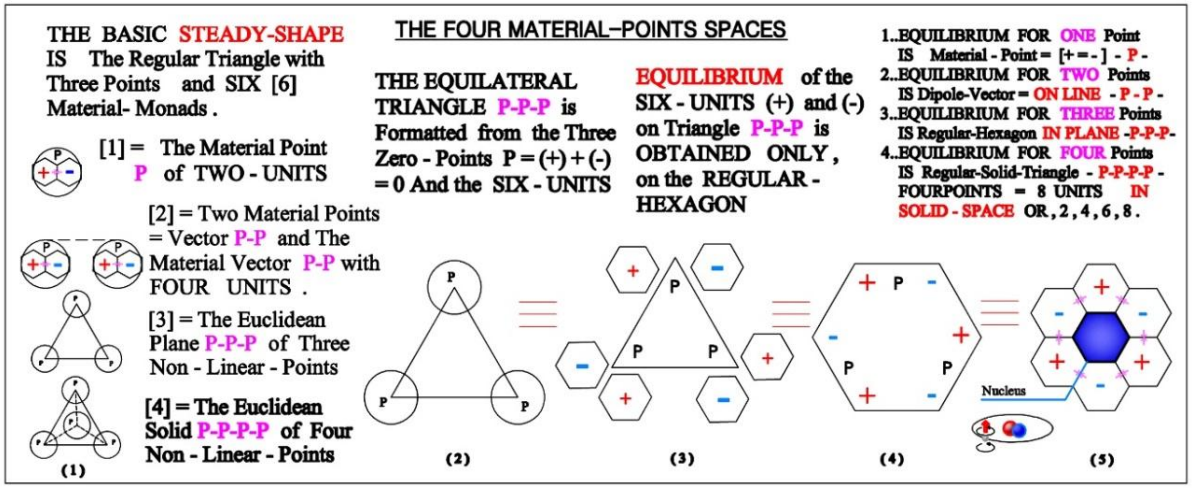
Becomes from E-equation $\bar{q} \equiv \frac{m_e c^2}{2} = \frac{g}{4\pi f^2_e}\left[\frac{c^2}{2}\right] = \frac{g\,c^2}{8\pi f^2}$

while for Photon is directly from G = F = σ A = $(2\pi f\,r)\frac{A}{\Phi} = wr\frac{A}{\Phi} = \bar{v}\,\frac{A}{\Phi} = \sigma\,\Phi^3$, which is a straight-line-Voltage . Since Energy is produced from motion , which is the continuous removal of [{+} to →{-}] 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.s = [F⊥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 , and thus is created the **E -Spin** as $2S = M_u$ x[{+}→{-}] , and is acting on [{+}→{-}] axis . **i.e. The Stationary- Electron - Charge is the Storage of r** ≡ L_p , cave in-where the ***Space*** and ***Anti-space*** , as **π g** ,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** $\mathbf{f_n} = \sqrt[2]{g^{-1}\pi^{-3}}$ of cave in Electric-Field-lines **E** = g π . 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 .

In [2] the ***Electrostatic Unit of Charge*** $\bar{q}_P$, the Quantum of All , *which when concentrated at Point* {+} *and placed at a unit distance from an equal and Opposite concentrated quantity* {-}, **Is the Pulling with a Unit-force** . Mass m_e is the reaction to this Inner motion of [{+}→{-}] 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 as $f_e = \frac{(1+\sqrt{5})\,\sigma}{4\pi r} = \frac{\sigma.\Phi}{2\pi r} = \frac{\bar{B}}{\pi^2.\, r^4}$
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 π 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 [⊕] *constituent* ***towards*** [⊖] *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 $\bar{v} = [\frac{G\,\Phi}{A}]$. Because $f_n = \frac{\bar{B}}{\pi^2.\, r^4} = \frac{\sigma^2.\Phi^2}{4.\bar{B}}$
so , Stress σ = 0 → σ , and $\bar{B}$ = Angular-Momentum = AM independent of σ .
→ AM , and Spin is equal to AM / Unit-Area = AM / π , and because of the Closed ***One-way loops*** ,**Spin is either Positive or Negative** and is → Electric-Charge $\bar{E} = \pm$ AM / π = E-Spin = The ± 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 $E = \frac{m_e\, v^2}{2} = g.\, v_e^2 / 8\pi\, f_e^2 = \bar{q}_e V = h.\, f_e$, and $g.\, v_e^2 = 8\pi h.\, f_e^3$ or
$[v_e^2/f_e^3] = 8\pi h/g =$ constant ,or $v_e^2 / f_e^3 = k$, and $v_e^2.T_e^3 = k = \frac{v^2}{f^3} = f^3\,(\frac{T}{\lambda})^2 = f^3.\,[\frac{\pi\lambda}{f}]^2 = k$
i.e. The ***Electron-velocity squared*** to the ***Electron`s - cube Frequency*** is constant following the Orbit-Unit-Energy equation $k = f^2_e\, a^3$ , 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 ⊥ M** , travelling with v_e , inner velocity as
E = A . sin[kx-wt] and as M = A . sin[kx-wt] , and E = M = A .[1 - sin wt] , since sin kx = 0 .
i.e. The Moving-Electron-Charge is The Electromagnetic-Wave , E ⊥ 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 ≡ r** cave is stored in the form of Dipole-rotation ,



Angular-momentum due to curved motion , with Spin , **S ,** directed from {-} →{+} and to G-Primary-Direction of frequency **f = 1/T** , and which is the Source in cave **r** .

3g.. 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 a Space i.e.
The **One-Point** in E-G is defining ***One-Material-Point-Space*** , the M-P.
The **Two-Points** are defining the ***Line-Segment-Space*** , the Line-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 , [⊕],[⊖] with Dimension as , ***the Material-Vector*** ⊕ → ⊖
2.. Two-Points → Four-Units , [⊕],[⊖] with One Dimension as , ***the Material-Line***
3.. Three-Points → Six-Units , [⊕],[⊖] with Two Dimension as , ***the Material-Plane***
4.. Four-Points → Eight-Units , [⊕],[⊖] with Three Dimension as ,***the Material-Volume***
Keeping ***the Property of Edge-points*** to be the Vector ⊕ → ⊖ 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 $q = [s+\bar{v}\nabla i] = \overline{AB}$ Properties i.e.
[⊕] → the Positive constituent of Quaternion at , A point
[⊖] → the Negative constituent of Quaternion at , B point
In Euclidean-Geometry E-vector $\overline{AB}$ carries **Point** A **to Point** B as , Vector A → B
In Material-Geometry M-vector $\overline{AB}$ **carries Energy** , ⊕ **, from Point A** to ⊖ , **Energy of Point B** as , ⊕ **moves to** ⊖ , 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 . 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-
4g.. 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 ≡ 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 $\mathbf{f^2_p} = \frac{1}{r^3}$ then $f_{min} = 2{,}839844.10^{10}$ H , and Bonding Energy $L \equiv E = h.f_N = 6.62607.10^{-34}$. $2{,}8398447.10^{10}$ J /$1{,}6.10^{-19} = 1{,}176063.10^{-6}$ eV or in Joule = $1{,}8817009.\ 10^{-23}$ J = (Kg.m2/s²). Hydrogen cave was found $a_H = 2{,}11450164.10^{-11}$ m and from Orbit-Quantum-Energy $f^2_H = \frac{1}{g.r^3} = \frac{1}{9{,}8076754.(2{,}1127839.10^{-11})^3} = 10{,}811069.10^{30}$.
$\mathbf{f_H} = 3{,}288019.10^{15}$H , while Nutation-Frequency $\mathbf{f_N} = \frac{sQ}{2\pi.J_3 w} = 2{,}8398447.10^{10}\ s^{-1} = f_{min}$
Energy in caves $\mathbf{E}=\left\{\frac{k}{r}+\frac{L^2}{2m\,r^2}\right\}=\left\{\frac{\pi g}{r}+\frac{L^2}{2\left(\frac{g}{4\pi f_e^{\,2}}\right)r^2}\right\}=\frac{\pi}{g\,r^2}[\,g^2r+2L^2f^2]$...(1) It was proved that magnitude $\bar{L} = \bar{a} \times \bar{v}$ = **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 ,
$K_E = \frac{mv^2}{2} = \frac{m.GM}{2.\ R} = \frac{GMm}{2.\ R}$, or $K_E = (1/2)\,(-P_E) = -\frac{P_E}{2}$ and → $-\ P_E = 2.K_E$ ← ….(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 $\mathbf{E = \frac{1}{r^2}\left[\frac{4\pi^2}{c^2}+\frac{S^2}{2m}\right] = \frac{1}{9a^2mc^2}}[36m\pi^2+2c^2E^2]$ then becomes $2c^2.E^2 - 9mc^2r^2.E + 36m\pi^2 = 0$, which is an 2nd degree Equation with solution →

$$E = \frac{9mc^2r^2}{4c^2} \pm \frac{1}{4c^2}\left[\sqrt[2]{36mc^2r^4 - 36.8.\,mc^2\pi^2}\right. \quad \text{…….(3)}$$

Since E must always be Negative then , $mc^2r^4 - 8mc^2\pi^2 < 0$, or → $r^4 - 8\pi^2 < 0$, and from

$$r^4 < 8\pi^2 \rightarrow r^2 < \sqrt{2}.2\pi \quad \text{then} \quad r < 2{,}980856\ \text{m} \quad \text{…….(4)}$$

From Unit-energy relation $g f^2 a^3 = 1$, then $\mathbf{f_R} = \sqrt[2]{\frac{1}{g.a^3}} = \sqrt[2]{\frac{10^3}{g(2{,}980856)^3.10^3}} = 6{,}14453.10^{-2}$ H **i.e**.
a frequency corresponding to Energy **E** = h f = $6{,}62606957.10^{-34}.6{,}14453.10^{-2}/1{,}602.10^{-19}$
= **2,541136 .10^{-10} eV** in a cave $\mathbf{a} = \sqrt[3]{\frac{1}{g.f^2}} = \mathbf{2\ ,\ 980856 <\ 3m}$.

The kicked-Energy is $\rightarrow \overline{B}.f_n = E \equiv [\frac{\sigma.\Phi.\overline{B}}{4\pi r}] = 1,4603748.10^{-34}.6,14453.10^{-2} = 8,97332.10^{-36}$ [Kg.m2.s/s = Kg.m2] , and from $c = \frac{G\,\Phi}{A} = \frac{G\,\Phi}{e^{-i.(\frac{\pi}{4}).b}}$, where $A = \sqrt[2]{-i} = e^{-i.(\frac{\pi}{4}).b}$, then are

The → **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 →A = {The Space +Anti-Space Positions in Universe }** ,become **Inadequate** for Energy-Storage $\mathbf{A} = e^{-i.(\frac{\pi}{2}).b} = 0,207879576.b = 1,507.10^{-7}$m , then **Motion≡ Energy≡** E is filling **The minimum cave** r **,** and with the **Necessary-Velocity-Vectors → 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 $E \equiv \bar{v}.[\boxed{\bar{f}_n} + \mathbf{f_n}]$.

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 , $\mathbf{1 = c\,.\,f_n^2.\,a^3}$, and of the same constant Energy . Semi major axis , **a** , is related to energy as → **,** $\mathbf{a} = G\,M\,m / 2E$ **, and** for ellipse (a b axis) $\frac{B^2}{(mab)^2} = -\frac{q.q`}{(ma)^3}$ and Spin $|S|^2 \equiv [\overline{B}]^2 \equiv -\,m\,q\,q`[\frac{b^2}{a}]$ or $\overline{B} \equiv \sqrt[2]{maqq`}[\frac{b}{a}] = \overline{B} \equiv \sqrt[2]{maqq`}$ for a=b i.e. for very large Energies , semi major axis tents 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*** $f_n \rightarrow \infty$, or $E = \rightarrow \infty$, which is a Black-hole . [61]

In **Black-holes** where exists the Rotation-Energy , *the Spin* ,velocities follow Quantization of Unit-velocity as $\mathbf{v} = 2\pi.f_1[\mathbf{n}\,c/2f_1] = \mathbf{n.\pi.c}$. From prior relations in B-Holes-Energy is found the SPIN , S ≡ B , using equation of kicked-Energy as → $\overline{B}.f_n = E \equiv [\frac{\sigma.\Phi.\overline{B}}{4\pi r_n}] \leftarrow$ for r_n .

Angular-Momentum $\overline{B} = \frac{2L}{\bar{w}} = \frac{2L}{2\pi f} = \frac{\pi^2 r^4.f}{2}$, and vector $\overline{B} = a\,m\,v$, becomes $\overline{B} = a\,m\,v = 2,1127839.10^{-11}$ m .7,237315.10^{-32} kg .2,99798 . $10^8 = 4,5841758.10^{-34}$ / π , and Spin **S/2** = 1,4603748.10^{-34} which is the E-Spin . From cave-relation , **a** cave , as $d = a = \sqrt[3]{\frac{1}{g.f^2}} = \sqrt[3]{\frac{1}{9,808.f_{3M}{}^2}} = \sqrt[3]{4,851734.10^{-30}} = \mathbf{a} = 1,69290399.10^{-10}$ m , then it is **Bracket-length**

$\Delta = 2a = 3,3858078 . 10^{-10}$ m .The Black-Hole-Gravity-equation related to the Inner-Quantum-velocity v = c , and to its n **, lobes** is the frequency squared as ,

$\mathbf{f^2} = \frac{k}{m.a^3} = \frac{\pi g}{a^3.[\frac{g}{4\pi f^2}]} = \frac{4\pi^2 f^2 g}{g a^3} = \frac{w^2}{a^3} = \frac{v^3}{a^4}$, and → $\mathbf{f_n} = \frac{c}{a^2} = \frac{n.\pi.c}{a^2} \leftarrow$ Energy Increases .

Constant-Force $G \equiv \sigma.\Phi^3 \equiv \Phi^2.[\{\sigma\,\Phi\}] \equiv [\frac{2B}{\pi r^3}] \equiv 2\pi\,f_P\,r \equiv w\,r \equiv \bar{v} \equiv m\,a \equiv m\,g = \bar{c} = \frac{2.B}{\pi r^3}]$

Energy of Photons = motion / $T \equiv (\frac{v}{2\pi r}).[\sigma + \sigma\,\Phi] =$ velocity → $\bar{v}.[\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}] \equiv \bar{v}.[\boxed{\bar{f}_n} + \mathbf{f_n}]$

For **Black-Holes** , the Total-Energy $L = \overline{B}\,\bar{w} = \frac{J.w}{2}$ $w = \frac{\pi r^4}{2}[2\pi f]^2 = \mathbf{2\pi^3 r^4 f^2} = r\,mv = r\,m\,.wr$ and mass $\mathbf{m} = \frac{2\pi^3 r^4 . f^2}{r^2 2\pi f} = \frac{\pi^2 r^2}{1}\mathbf{f} = [\frac{\pi r}{2}]\mathbf{v}$,while **Angular-Momentum B** $= r.mv = r\,[\frac{\pi r v}{2}]\,v = \frac{\pi\,r^2}{2}\mathbf{v^2} = \frac{\pi\,r^2}{2}\mathbf{v^2} = \frac{\pi r^2}{2}\,\mathbf{[n.\pi.c]^2} = \frac{\pi^3 r^2}{2}\,\mathbf{c^2}$, or Black-Hole-Energy → $\mathbf{B_E = 2.\pi^3.r^4\,.f^2 = 2r(\pi r)^3.f^2} \leftarrow$ i.e. **Velocity in Black-Holes is Related to Cave , r ³, and Energy f² times of light velocity**. The Produced Work relation , $W = 2L = \overline{B}\,.\,\bar{w} = J.w^2$ **,** and being as Centripetal-Force

$F_G \equiv [\frac{v^2}{r}]\,Jw^2 = \frac{v^2}{r}\,[\frac{\pi r^4}{2}]\,\frac{v^2}{r^2} = \frac{\pi r v^4}{2}$, which Generally represent ,

The Black-Hole-Gravity-equation Related to the Inner **Quantum-velocity$\bar{v}$ to its ,n, lobes**.

For gravity $g \cong \boldsymbol{\sigma} = \frac{Force}{Area} = \frac{Mass}{Area}$ = Gravity-Acceleration and Impedance , s , then

$\mathbf{g_G} = s\,[\frac{\pi r v^4}{2}] = [\frac{3,1415926([\sqrt{5}+1].\sqrt[4]{2}.10^{-35}).(299793458)^4}{2}].e^3 =$

$6,044981.10^{-35}.80,776078.10^{32}.\,20,085536 = \mathbf{9,8076925}$, and is a constant .

Moreover , from the Primary equation of Electron → $\mathbf{w^2_e}.\,\mathbf{m_e} = \pi\,\mathbf{g} = \mathbf{constant} \equiv \mathbf{Energy} \equiv [\textbf{\textit{meter}}\ \mathbf{of}\ \textbf{\textit{area}}\ \textbf{\textit{* meter of force}}] \equiv \mathbf{Electrons\ on\ Orbits}$, on *Traces* and also from the **Unit-Space ≡ Massive -United-Unit-Space ≡ → [+$\bar{v}$.s²] ← The Nucleus** is jointed through the Neutral Material-Points [(+) [↔**]** (-)] with the , **Strong-force** → $S_F = h\,.f_n \equiv h.\{[S \equiv B_P$

$\equiv$ **EM-R** $\equiv$ $f_{1=N}$, f_2 , f_3, f_D ,$f_n = w^2]\} \equiv h.n\frac{(1+\sqrt{5})\sigma}{4\pi r} \equiv h\ \frac{2.\bar{B}}{\pi^2.r^3}$, *Increasing-Energy* .....(mg)

From relation Force $G = \sigma A = [2\pi f r]\frac{A}{\Phi} = w r = \bar{c}\ .[\frac{A}{\Phi}]$ i.e. Action of $G \rightarrow$ on $\bar{c}$ and , following relation $\boldsymbol{\sigma}$ **x** $\boldsymbol{\Phi^3 \equiv G}$, 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 the 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 F_g is ,

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

and $F_g = \bar{g} = 4.\sqrt{3}.1{,}0986122886681.\pi^2.1{,}616199.10^{-35}.[2{,}99793458.10^2]^4 =$ **9,8076754** which agrees with the Prior .

5g... Applications :

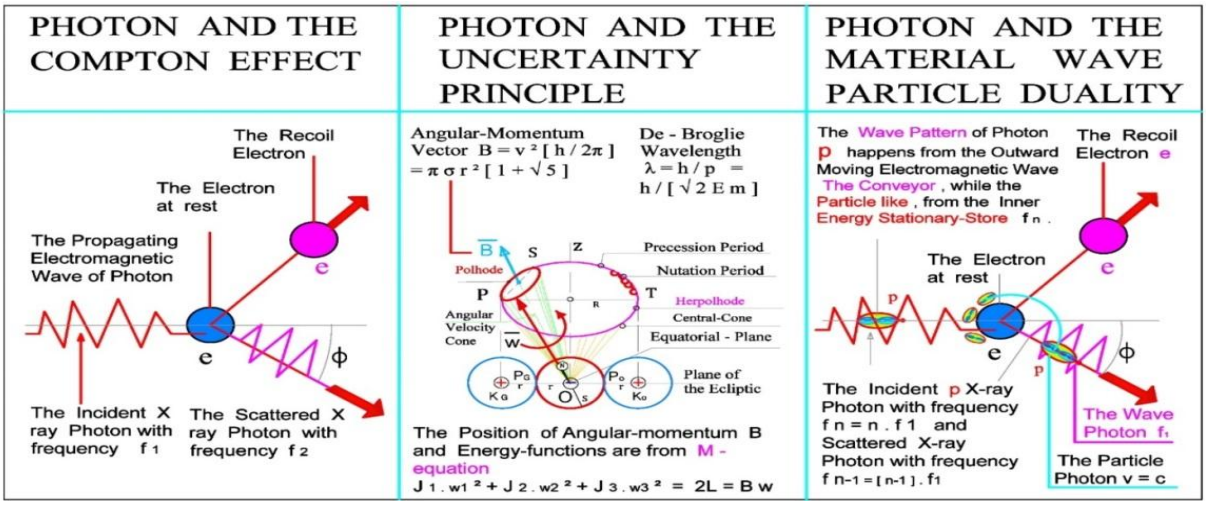


Figure – 20- : The Wave-Particle Duality of Photon as Wave and as Particle :

The equation of Photon is $\rightarrow \{\bar{c}\ .\ \boxed{\bar{f}_n} + \bar{c}\ .\ f_n\} \leftarrow$ i.e. Dual Frequencies ,

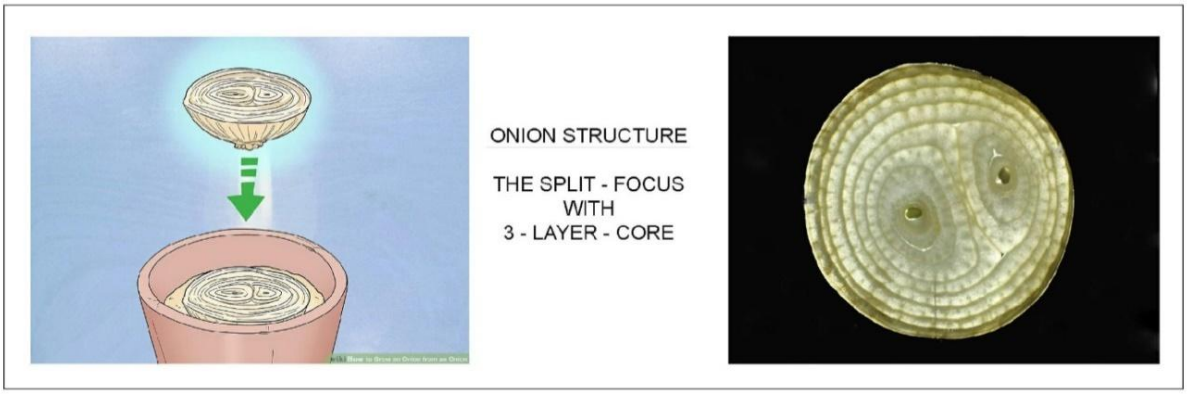
The **Wave** $[\mathbf{f_1} = (E^2 + H^2) = n\frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{2.\bar{B}}{\pi^2 r^4}]$ - **Particle** $[\bar{v} = \bar{c} = \lambda\frac{f}{\Phi}] \rightarrow$ Duality

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** $\mathbf{B_P}$, 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 $f_P = \frac{\sigma.r}{\pi.\bar{B}} = \frac{n\sigma.\Phi}{2\pi r}$ exists in nature from the micro to the macro scale and is a **Pressure everywhere** in all the Energy structures . Energy as motion defines **In-Box** , the minimum **Resonance-Golden-ratio frequency** $f_R = f_1$ which *follows 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 the **Energy-Space United-universe** of one Force which produces **Work** $\equiv$ **Force** x **Space** , and which is conserved as motion in all Space-Boxes. Potential-Energy $\equiv$ $\mathbf{P_E}$ **stored** in Material-point is the Electric-Field $\mathbf{E = g\ \pi}$, 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** = ½ 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 $\bar{\mathbf{B}}$, is equal to **± Spin S .** Material Points , Segments etc. consisting the Physical Structures . In the finite-Space of Material-point , ***cave* r , *is stored the Work as frequencies*** , Because Stress $\sigma > 0$, Spin $\equiv$Angular momentum $\bar{\mathbf{B}}$, is equal to AM /Unit-Area = AM / π ,and frequency $f_n = \frac{\bar{B}}{\pi^2 r^4}$ so **Spin is either Positive or Negative** and equal to the Electric-Charge $\bar{E} = \pm$ AM / π . The Spin becomes from the $\uparrow\leftrightarrow\downarrow$ Antiparallel Angular - Momentum-vectors $\bar{B}$. which is equal to the **Golden-ratio** , ***Spin of cave r*** ,**the Spinning-Stationary M-point** with

Fundamental frequency $\mathbf{f_1}$ of equation → $W = [\frac{4\pi r^3}{3}].f_1 = \frac{(1+\sqrt{5}).\sigma.r^2}{3} = 2L = \bar{B}.\bar{w} = J.w^2$.
This Stationary–Energy-Storage is as **Coulomb Electrical-Force** where the Electrical-Force
$\mathbf{F_{electron}} = k_c \frac{Q_1.Q_2}{d^2} = \frac{[\oplus<\rightarrow\leftarrow\ominus]}{d^2} = k_c \frac{2\sigma}{|e|^2} = k_c [\frac{4\pi f_1}{r\Phi}] = k_c \frac{\sigma}{2r^2} = \mathbf{k_c} \frac{\mathbf{2\bar{c}}}{\mathbf{r^2\Phi}}$ in Box B_e ,and for Photon
$\mathbf{F_{photon}} = \frac{[\oplus<\rightarrow\leftarrow\ominus]}{r^2} = \frac{[\sigma.\sigma]}{r^2} = \left|\frac{\sigma.}{r}\right|^2 = \left|\frac{2\pi f.}{\Phi}\right|^2 = \left|\frac{w}{\Phi}\right|^2 = \left|\frac{2L}{\Phi\bar{B}}\right|^2 = \left|\frac{\bar{c}}{r.\Phi}\right|^2$, in the same Box B_e , since
Angular-momentum ≡ **Spin** ≡ $\bar{B} = \frac{\pi r^3 \sigma}{4}[1+\sqrt{5}] = |\frac{\pi r^3 \Phi\sigma}{2}| = [\frac{\boldsymbol{\pi r^3.\bar{c}}}{\mathbf{2}}]$, as Orbit-Forces.
Above relation agrees with ***Laplace-equations*** for Incompressibility and Irrotationality where
$\nabla x\bar{q} = \bar{r}_x + \bar{v}_y = 0$,and $\nabla x\bar{v} = \bar{v}_x - \bar{r}_y = 0$, meaning that Space , $\bar{\mathbf{r}}$, and Energy , $\bar{\mathbf{v}}$ = motion are Interchanged → Because from the first relation the ***Magnetic-field-Space*** $\bar{r}_x$ creates the ***Electric-field-Energy*** $\bar{v}_y$, and from the second → ***Energy*** $\bar{v}_x$ Pushes the ***Space*** $\bar{r}_x$. From Electron-Orbit-equation $4\pi^2 f^2_e.m_e = k = \pi g$ or $4\pi f^2_e.m_e = g$, $\mathbf{k = \pi g}$, they denote ⊕ **Space** ≡ Electric-field in-where exist Electric-lines i.e. the tracks of Electron motion of the ⊖ **Anti-space** . The Right Momentum vector AM ≡ ↑ is the Produced Work and **stored in Magnetic-field** as motion while left-vector AM ≡ ↓ is the Produced Work and stored in the opposite **Magnetic field** as motion and both consist the Dipole [⊕<→⊖] , ***Tack-Geometry*** .
The **Chains of Stationary-Periodic-Spins** are Pointy-vibrating in Orbit LRC- Circuit with its frequencies $\{\mathbf{f_1} = \frac{(1+\sqrt{5}]).\sigma}{4\pi r}\}$ x $\bar{\mathbf{B}} = [\boldsymbol{\sigma\,\Phi\pi\, r^3}]$ $\mathbf{f} = \frac{\bar{B}^2}{\pi^2.r^4} = |\frac{\pi r^3\sigma\Phi}{2}|\bar{\mathbf{B}}$, filling up the entire universe.
Stationary-Electron-Charge q ≡ ⊖ , with **Orbit-Velocity-Vector** $\bar{\mathbf{v}} = \sqrt{\frac{2}{m}[E - \{\frac{k}{r} + \frac{L^2}{2mr^2}\}]}$
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 $\mathbf{E} = \left\{\frac{k}{r} + \frac{L^2}{2m\,r^2}\right\} = \frac{2\pi g}{r} + \frac{S^2}{2(g/4\pi f^2)\,r^2} = \frac{\mathbf{2\pi}}{\mathbf{g\,r^2}}$ **[$g^2r + S^2.f^2$]**..(s) Equation (s) issues for 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 [(+) [↔] (-)] with the **Strong –Nuclear - Force**
$\mathbf{S_F} = h\,f_n \equiv h\,.\{[S \equiv B_P \equiv \mathbf{EM\text{-}R} \equiv f_{1=N}, f_2, f_3, f_D, f_n]\} \equiv h.n\frac{(1+\sqrt{5})\sigma}{4\pi r} \equiv h\frac{n\sigma.\bar{B}}{8\,r^2}$
are so because $f_n = |\frac{\sigma^2\Phi^2}{2\pi.c}|.\bar{B}$, 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 → **Lissajous – Eight - Shapes** .
The Linear-Vibrations [$\ddot{x} + w^2 x = 0$] of the 3-masses , Occur on the Two Perpendicular each other , Line-Vectors of , $x \perp y$ Plane , as above Shapes which for ,

a.. Difference of Phase $d_\varphi = 90^0$ emission is → The Eight-Shapes □ on Nucleus .
b.. Difference of Phase $d_\varphi = 0^0$ emission is → The Ellipse-Shapes ∝ , after 1st curve.
c.. Difference of Phase $d_\varphi = 45^0$ emission is → The Double-Saddle-Shapes . ∞ , ☋ , on the two , One Proton and One Neutron-Nucleus . Circular-motion happens after the Lissajous-Shapes on Elements $2m^2 = 2.4 = 8$ region which is the Helium cave .

Light velocity vector $\bar{v} = \bar{c}$ Acting on **an-cave** , $\mathbf{r} \neq L_P$, faces-to the Impedance $\mathbf{Z_c}$ from

Velocity $\bar{\mathbf{c}}$, and Becomes the minimum-Energy-cave in L_P , and Equal to $\mathbf{E \equiv r\ Z_c\ \bar{c}}$, and $r_H = \frac{\mathbf{h}}{\mathbf{c.Z_c}} = \frac{[6{,}62606957.10^{-34}]}{2{,}99798\ .10^{8}\ .1{,}0460975.10^{-31}} = \mathbf{2{,}1127839.10^{-11}}$ m , which is the Hydrogen cave.

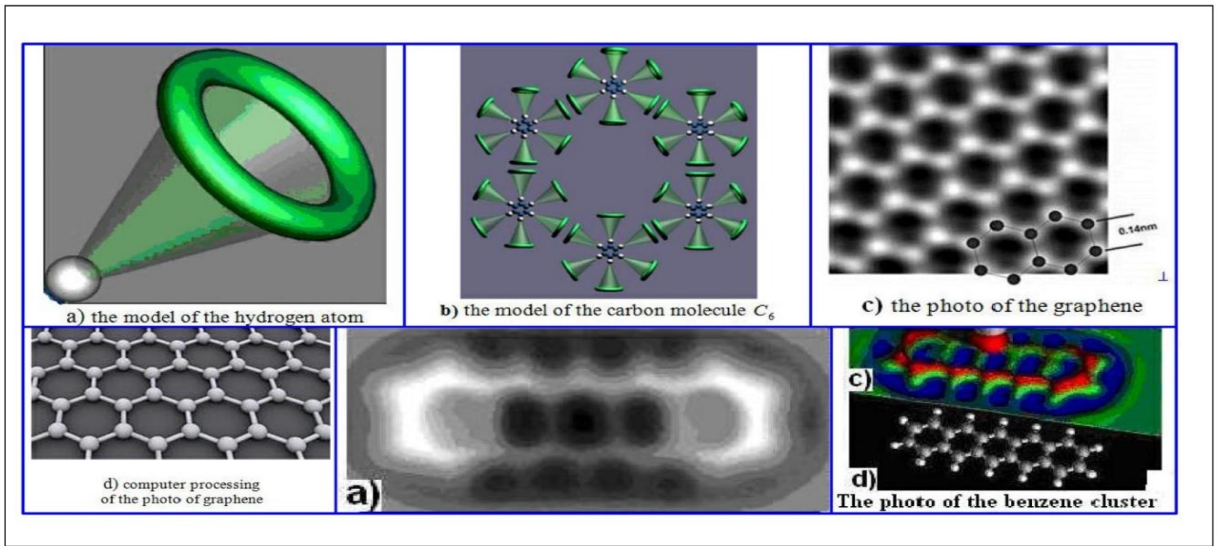


Figure – 22 - : Photo from → RESOLUTION OF THE RUSSIAN THEORY OF MICROWORLD : By Professor Ph. M. Kanarev [kanarevfm@mail.ru]

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 x 2 = 6 (±) 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] .

6g... The **Greatest Energy-Pressure-Level** :

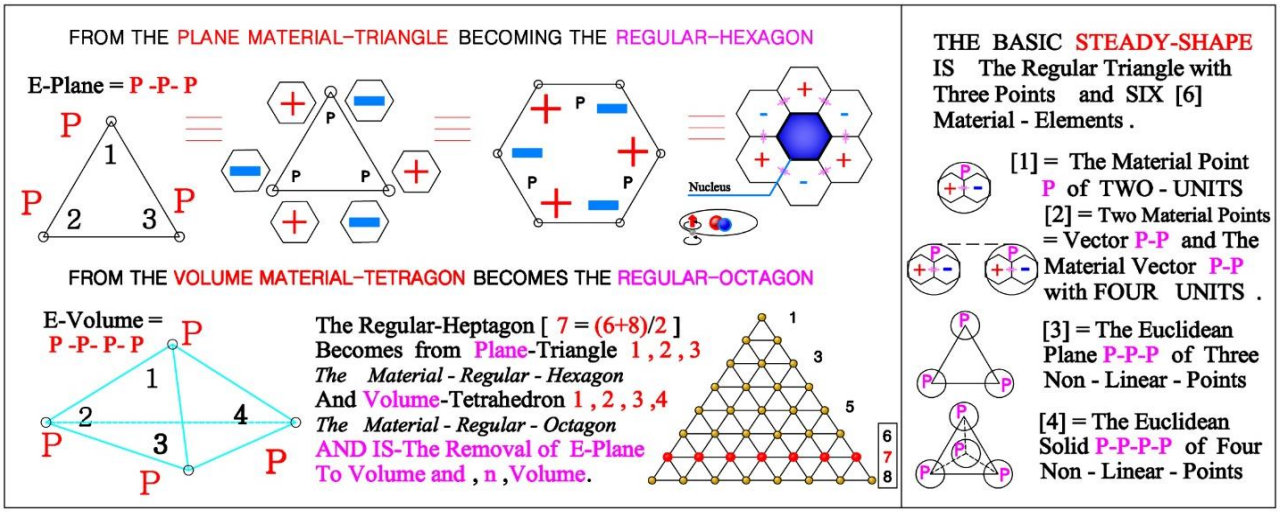


Figure – 23 - : The [+] Spaces , [-] Anti-Spaces , [+ -] Sub-Spaces in a circle (R , OA) The Material-Geometry explanation of Pascal`s-Triangle

Stress $\sigma = \frac{\text{Force}}{\text{Area}}$, and is the Pressure executed by the Force on 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) $= \frac{N}{m^2} =$

$\frac{Kg}{ms^2} = \frac{J}{m^3}$,with minimum SP ,equal to Quantum $p_o = 2.10^{-5}$ Pa ≡ 0 (dB) the Decibel .
The equation of Sound-Pressure-Level ,SPL , is $L_{SP} = 20.\log_{10}(\frac{P}{Po})$ dB ,where P =Pressure
L_{SPo} = 0 dB corresponds at frequency f_s= 1 kHz . The Sound-Intensity-Level ,SIL is ,
$L_{SI} = 10.\log_{10}(\frac{I}{Io})$ dB , where Intensity $I = \frac{P^2}{Z_0}$ and Impedance Z_0 = 400 Ns/m³
The greatest SP, cannot be exceeded the average air pressure which is 101325 Pa and fixed

$$\textbf{SPL , is } L_{SP} = 20.\log_{10}(\frac{101325}{0,00002}) = 194 \text{ dB} \quad \text{.....(s1)}$$

In Material Geometry Photon-frequency $f_{ph} = [\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}]$ which is related to the Stress , **σ** = Force/Area , and is the **Energy-Pressure-Level** , **EPL** , of the ,**Wave + Particle Photon** , for its frequency .The Greatest EPL for the two Opposite-Elements {⊕ , ⊖} in Space is their Permutation $\mathbf{P}^2_{1S} = 2$ and for Anti-Space $\mathbf{P}^2_{1AS} = 2$ or for both $\mathbf{P}^2_{1,S+A} = 2 . 2 = 4$ min-Levels .
Because [9] , The Circumscribed-Regular-Polygons in a circle (R,OA) Denote the Spaces and Anti-Spaces [(⊕↔⊖)] , and Inscribed-Regular-Polygons of the circle Denote the Sub-Spaces
and Because [63] ,The Regular-Polygons Denote the Structure of Material-Geometry to be as ,
A Point → n = 1 m = 2 , { S ≡ ⊕ ↔ ⊖ ≡ A} → **S** = Space , **A** = Anti-Space
Line-sector → n =2 , m = 4 , $\begin{pmatrix} S & \leftrightarrow & S \\ S & \rightarrow\leftarrow & A \\ A & \leftrightarrow & A \end{pmatrix}$ → **S** = Space , **A** = Anti-Space

Plane-Triangle → n =3 , m = 6 , $\begin{pmatrix} S & A & S \\ s & s & s \\ A & S & A \end{pmatrix}$ → **S**= Space , **A** = Anti-Space **s** = Sub-Space

A Volume → n =4 , m = 8 , $\begin{pmatrix} S & A & S \\ s & S & s \\ A & S & A \end{pmatrix}$ → **S**= Space , **A** = Anti-Space **s** = Sub-Space

and Because **Regular-Hexagon** is of 3x2 = 6 Vertices on ***Plane-Triangle*** +
Regular--Octagon is of 4x2 = 8 Vertices on ***Volume-Tetrahedron*** **then** ,
Regular-Heptagon-Anti Heptagon is of , 7x2 = 14 Vertices [63-P70].
Regular-Heptagon Between the Two-Regions , ***Plane –Volume*** , Needs more **Pressure** ,and consists the Upper - Largest Energy-Level with Permutation , the number of **Permutation** with Repetition of the **Seventh** - Element as , $RP^n_2 \equiv n^2 \rightarrow \mathbf{P}^7_2 = 7^2 = 49$, and
The Greatest **EPL** is → $\mathbf{P}^2_{1,S+A}$ x $\mathbf{P}^7_2$ = 4x49 = 196 = $\mathbf{L_{EP} = 196\ dB}$ ....(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 ≈196 dB ,differing 2 Units which can be changed by altering the Base of Pressure from 101325 → 102389 Pa .
3… Minimum and Maximum limits , 0≈194≈196 dB , become from $L_{EP} = [\frac{\pi^2}{Nc}]^3 = 194$ dB
4… Stress **σ** , occupies Minimum and Maximum because is related to frequency and velocity
$f_{ph} = [\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}] \equiv \frac{\sigma+\sigma\Phi}{2\pi r} = \frac{\sigma[1+\Phi]}{2\pi r} = \frac{\sigma[\Phi]^2}{2\pi r}$, or $\boldsymbol{\sigma} \equiv \frac{\mathbf{f_{ph}}.2\pi.\mathbf{r}}{\boldsymbol{\Phi}^2} \equiv \frac{\mathbf{w}.\mathbf{r}}{\boldsymbol{\Phi}^2} \equiv \frac{\mathbf{v}}{\boldsymbol{\Phi}^2} \equiv \bar{\mathbf{c}}\frac{\mathbf{1}}{\boldsymbol{\Phi}^2}$
and is **The-Stress-Way** of Photon-Storages $\boxed{\bar{f}_n} \equiv \frac{\sigma}{2\pi r}$,and Photon-Information $\mathbf{f_n} \equiv \frac{\sigma\Phi}{2\pi r}$
From force $G \equiv \sigma.\Phi^3 \equiv \Phi^2.[\{\sigma\ \Phi\} \equiv [\frac{2B}{\pi r^3}] \equiv 2\pi f_p\ r \equiv w\ r \equiv \bar{v} \equiv m\ a = m\ g = \bar{c}\ ]$ then
Stress $\{\ \boldsymbol{\sigma}\ \Phi\ \} \equiv [\frac{\mathbf{2B}}{\pi r^3}] \equiv 2\pi.\mathbf{f_P}\ r \equiv w\ \mathbf{r} \equiv \bar{\mathbf{v}} \equiv m\ \mathbf{a} = m\ \mathbf{g} = \bar{\mathbf{c}}\ ]$ is dependent on Total-Prior.
As soon as A = σ Φ ≡{The Space +Anti-Space Positions in Universe }, become **Inadequate** for an **min-Energy-Storage** $\mathbf{A} = e^{-i.(\frac{\pi}{2}).b} = 0$,207879576.b = 1,507.10^{-7}m ,then **Motion ≡ Energy** is first filling **The minimum cave** , r , and with the Necessary **Velocity-Vectors** → **Burst Into another cave** a > A = 1,507.10^{-7}m **in** L_p , and **connected to G** , and which **Is an Overflow of the Energy** in the , **Space +Anti-Space Positions** [58] .
From relation $E_{Ph} \equiv \vec{c}.\ \{\ \boxed{\bar{f}_n} + \mathbf{f_n}\ \}$ is seen the Storages and from $\bar{\mathbf{q}}_{Photon} \equiv \frac{\vec{c}.\sigma\Phi}{2\pi r} \equiv \frac{\vec{w}.\sigma\Phi}{2\pi}$ the Stresses of Photons .

H … THE ELEMENTARY PARTICLES **:**

1h.. The Size of Cosmic Particles .

1.. The **Three Elements** ≡ Digits of Material-Geometry are , {⊕ , [⊕↔⊖] , ⊖}≡ [+, 0 , -]

The **Permutation** , *arrangement* , of the Two-Elements $P_1^2 = \mathbf{2}$, i.e. the → [⊕,⊖] - [⊖,⊕]
The **Three-Elements in Space** need $P_1^3 = 3.(3\text{-}1).(3\text{-}2) = 6$ Positions and the same for **Three-Elements in Anti-Space** need $P_1^3 = 3.(3\text{-}1).(3\text{-}2) = 6$ Positions , and Total Places → $P_1^3 \,.\, P_1^3 = 6 \times 6 = 36$ Positions for **Spaces and Anti-Spaces** as **Impedance** , and as before maximum Growth for $\log_x x$ and Base x = 10 is $\log_{10} 10 = 10^{10}$ and for the two elements [⊕ , ⊖] , the Growth is $10^{[10]^2} = 10^{20}$ **Positions** ≡ Distances ≡ r , and since also issues $10^{-x} = \frac{1}{10^x}$, then **Impedance b for Two Elements in Space Anti-Space** , b = 36.10^{-20} m .
and for → $\bar{\mathbf{v}} = \bar{\mathbf{c}} = \frac{F\,\Phi}{A = b} = [\frac{G\,\Phi}{A}] = [\frac{6{,}673692.10^{-11}.1{,}6180339887}{36.10^{-20}.}] = 2.9995163.10^8$ m/s , and 200-times the Impedance = 200.b =$3{,}6.10^{-19} = 7{,}2.10^{-21}$ = Neutrino-cave $\mathbf{a_v} = 7{,}2.10^{-21}$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 Cave and is Equal to Gravity g , **while** The **Light velocity vector** $\bar{v} = \bar{c}$ Acting on **an-cave** , $\mathbf{r} \neq L_P$, as that is STPL-**Common circle** then finds The-Impedance $\mathbf{Z_c}$ of the Velocity $\bar{\mathbf{c}}$, and becomes the minimum-Energy-cave in 2r and Equal to $\mathbf{E \equiv r\ Z_c\ \bar{c}}$ …...(**1**) where , **E** = The Planck`s-Total-Energy $\mathbf{E_p = h}$ = $6{,}62606957.10^{-34}$ J.s , **r** = The min-Energy cave of Common-circle, $\mathbf{Z_c}$ = The Total Impedance in Universe ≡ Space + Anti-Space from velocity motion , $\bar{\mathbf{c}}$ = The light-velocity in m/s . Equation (1) becomes → $r\ Z_c\ c = h$ ….(1a) { From **3f..** Page 56 }
The **Three Elements** ≡ **Digits** of Material-Geometry are {⊕ , [⊕↔⊖] , ⊖} ≡ [+, 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*** $\mathbf{10^{-10}}$ of their **g-Position** so Antilog $10^{-g/10}$ = 0,10460975
For the three dimensions Total-Impedance $Z_c = 0{,}10460975.(10^{-10})^3 = 1{,}046097.10^{-31}$ and $\mathbf{r_H} = \frac{\mathbf{h}}{\mathbf{c.Z_c}} = \frac{[6{,}62606957.10^{-34}]}{2{,}99798.10^8.1{,}0460975.10^{-31}} = \mathbf{2{,}1127839.10^{-11}}$ m , and is the Hydrogen cave i.e.
$L_H = \mathbf{r} = \frac{\mathbf{h}}{\mathbf{c.Z_c}} = 2{,}1127839.10^{-11}$ m is the min-cave in Planck`s-cave with max-Energy **h** .
3.. It was shown that **The [Magnetic-Fields]≡[Energy-Baskets] is the Way for Energy Propagation** because Strength-field $\bar{\mathbf{B}}_\mathbf{F} = [\frac{\mathbf{2\pi.m_T}}{\mathbf{q_T}}]\mathbf{.f} \equiv \bar{B} = \frac{\pi r^3 \Phi.\sigma}{4} \rightarrow$ **Wave ≡** {[$\varepsilon E^2 + \mu B^2$] = 2.λc. $\mathbf{sin}\left[\frac{2\pi c}{\lambda}\right]\}$, $\bar{\mathbf{w}} = 2\pi f = \frac{S_p}{m}$, issuing that Tangent of Ellipsoid , $\bar{B} \perp \bar{\mathbf{w}}$ Vector , and the Tangent of Ellipsoid → $\bar{\mathbf{w}} \perp \bar{B}$ Vector . Also the Moving Electron of charge $\bar{\mathbf{q}}$ ≡⊖ , with the **Orbit-Velocity-Vector** , $\bar{\mathbf{v}}$ **,** as $\bar{\mathbf{v}} = \sqrt{\frac{2}{m}[E - \{\frac{\mathbf{k}}{\mathbf{r}} + \frac{\mathbf{L^2}}{\mathbf{2m\,r^2}}\}]}$, is forming angle < θ with $\bar{\mathbf{B}}$ Vector **, Creates IN ORBIT , r** , the Perpendicular Magnetic-Field $\bar{\mathbf{B}}$, which Magnetic-lines are the Energy circles **O** in **B** , *Due to the velocity-constituent* $\mathbf{V_p}$, and are Perpendicular to Magnetic-circles **O** , i.e. The Magnetic-field $\bar{\mathbf{B}}_\mathbf{F} = [\frac{\mathbf{2\pi.m_e}}{\mathbf{q_e}}]\mathbf{.f}$ …...(1)
It has been shown [82] that in a cave , *say Hydrogen cave* , Electron-Spin is the Angular momentum-vector $\bar{B}$ which rotates according to equation $\frac{dB}{dt} = [\bar{u}\bar{B}] = u\,B.[\bar{k}\bar{k}`]$ in the Gravitational Potential $U_g = [mg].s.\cos\theta = -sQ.[\bar{k}\bar{k}`]$, so the change of $\bar{B}$ is → $\frac{dB}{dt} = u = \frac{s.Q}{B} = \frac{s.Q}{J_3.w_3.}$ and from 1-degree equation of motion , u , $\ddot{\mathbf{u}} + \mathbf{w^2 u = 0}$, then **Period of Nutation** $T = \frac{2\pi}{u} = \frac{2\pi.J_3 w}{sQ}$, and **N-Frequency** $f_N = \frac{sQ}{2\pi.J_3 w}$ …(n) where , s = amplitude of vibration and Q = Q_+ = the force = mass .g . In the case of Null-Potential in a cave , equation (n) is , $f_N = \frac{s.Q_+}{2\pi.J_3 w} = \frac{r.F}{2\pi.(\pi r^4/2)(v/r)} = \frac{r^2F}{\pi^2 r^4 \bar{v}.} = \frac{F}{\pi^2 r^2 \bar{v}.} = \frac{r^2F}{[\frac{B}{f}]\bar{v}.} = \frac{r^2F.f_N}{B.\bar{v}.} = \frac{r^2F.f_N}{S.\bar{v}.}$, or $\mathbf{F} = [\frac{\bar{v}.\mathbf{S}}{\mathbf{r^2}}]$ …(2) and from **Lorentz-force** $F = \bar{q}\ \bar{v} \times \bar{B}_F$ and the Magnetic field $q\,v\,B = mv^2/r \rightarrow q\,B\,r = m\,v = m\,r\,w$
$\bar{B}_F = \frac{m.2\pi}{q}.f = [\frac{2\pi.m}{Q_+}].f$ and so , $\mathbf{F} = \bar{q}\ \bar{v} x [\frac{2\pi.m}{Q_+} f] = 2\pi.\bar{q}\bar{v}.[\frac{m}{mg}].f \equiv \frac{\bar{v}.\mathbf{S}}{\mathbf{r^2}}$ or → $\frac{\mathbf{2\pi\bar{q}}}{\mathbf{g}}\ \mathbf{f} = \frac{\mathbf{S}}{\mathbf{r^2}}$ and **M-Force** $\bar{B}_F = \frac{\bar{S}}{q.r^2}$ ...(3) and $\bar{B}_F = \frac{5{,}691952.10^{-34}}{1{,}602.10^{-19}[10^{-19}]^2} = 3{,}5525851.10^{23}$ T , half Plank-M-Field
Nutation-Force $\mathbf{F_N} = q\,c\,B = 1{,}602.10^{-19}.[2{,}9978.10^8].3{,}553.10^{23} \equiv \mathbf{1{,}7063.10^{13}}$ Newton.
Equation (3) relates the Inside existing force **F** , which becomes from Charge $\mathbf{Q_+}$ only , from Spin **S** , and of from **r ,** cave , and in STPL Mechanism creates the **Six-Forces** of Nature , i.e.
In the same cave **r** , Charge $\bar{\mathbf{Q}}_+$, creates the Magnetic field $\bar{\mathbf{B}}_\mathbf{F}$, in where gravity **g ,** acts on Charge mass $\mathbf{m_+}$ and creates the Nutation-frequency $\mathbf{f_N}$, and the Inertial-Force **F** .
The Hydrogen cave $L_H = \mathbf{r} = \frac{\mathbf{h}}{\mathbf{c.Z_c}} = 2{,}1127839.10^{-11}$ m is the min-cave in Planck`s-cave with max-Energy **h** .

The cave with [**Anti-Space + Space-Positions**] is $0{,}707106781.10^{-20}$ m
and is the **Border-line** between the , **Weak and Strong Forces** , because in this cave exist the maximum Space-Positions . Placing the above **r** Nucleus-Cave in charge $\mathbf{Q}_+$ then . $\bar{B}_F$

$\bar{q}_{W-S} = \frac{g.\bar{S}}{2\pi r^2} = \frac{9{,}8076754.[5{,}691952.10^{-34}]}{2.\pi.[10^{-20}]^2} = 8{,}8850576.10^{1}$ J/$1{,}602.10^{-19}$eV = $5{,}546.10^{25}$ eV

or **Border-line** of W-S Forces → $\bar{q}_{Weak-Strong} \equiv$ **5,546 .10^{16} GeV** ←

From Magnetic-field $\bar{B}_F = [\frac{2\pi.m_+}{q_+}].f = [\frac{2\pi.m_+}{q_+}].|\frac{F\,f}{\pi^2 r^2 \bar{v}.}| = [\frac{2.m_+.F.f}{\pi r^2.\bar{v}.q_+}]$ is , $\mathbf{F} = \bar{q}\ \bar{v}x\bar{B}_F = 2\pi.\bar{q}\bar{v}.[\frac{f=1}{g}]$

which is equal to Nutation-force $\mathbf{F} = [\frac{\bar{v}.\bar{S}}{r^2}]$ and so→ **M-Force** $\overline{Q_{P.E}} = f\,\bar{q}_{Cave} \equiv \frac{\bar{S}.g}{\bar{c}.r} \equiv \frac{g.\bar{S}}{2\pi r^2}$ ←
are the Potential-Energy-Forces in caves r , from which become all the known Forces ,

a). Gravitational-force as $\mathbf{F_g} = m_e . g$ The min-Quantum-Energy E = 1,1745 eV
b). Strong - force as $\mathbf{F_S} . r = [\frac{g.S}{2\pi r^2}] = 2{,}8.10^{4}$ N for , $10^{-14} < \mathbf{d} < 10^{-16}$ m ,
c). Electric-force. as $\mathbf{F_e} = q_+ . \bar{E} = 2{,}8.10^{3}$ N for , $10^{-\infty} < \mathbf{d} < 10^{+\infty}$ m ,
d). Magnetic-force as $\mathbf{F_m} = \bar{c}.\mathbf{q_+ B_F} = 2{,}8.10^{2}$ N for , $10^{-\infty} < \mathbf{d} < 10^{+\infty}$ m ,
e). Weak - force as $\mathbf{F_W}. r = [\frac{g.S}{2\pi r^2}] = 2{,}8.10^{-2}$ N for ,$10^{-17} < \mathbf{d} < 10^{-19}$ m ,
f). Strong - force as $\mathbf{F_S} . r = [\frac{g.S}{2\pi r^2}] = 2{,}8.10^{4}$ N for , $10^{-14} < \mathbf{d} < 10^{-16}$ m ,
g). X–Strong-force as $\mathbf{F_{xS}} .r = [\frac{n.g.S}{2\pi r^2}] = 2{,}8.10^{10}$ N for , $10^{-17} < \mathbf{d} < 10^{-20}$ m ,

Conclusions :

1.. The Total Impedance Z_c , is either Growth or Anti-Growth depending on the **velocity** $\bar{c}$ ***Energy*** , and the Number of Element=Positions , h . Neutrino-cave is $\mathbf{a_v}$ =7,0.10^{-21} m

2.. The Total Impedance Z_c =1,0460975.10^{-31}m , for the Three elements [+, 0 , -] ≡ ⊕,∅,⊖, ≡ Breakages { $\mathbf{s^2} \equiv$ + Charge , $\mathbf{-s^2} \equiv$ - Charge , $\mathbf{2s^2} \equiv 0$ Charge } issues in STPL - Line Common circle , 2r , which is the Physical-Rotor for the Cosmic-Particles origination .

3... The Duality-Photon Energy is → $\{\ \bar{c}\ .\ \boxed{\bar{f}_n} + \bar{c}\ .\ \mathbf{f_n}\ \}$← ≡ → Particle + Wave ← 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 λ=10^{-7}m V = $\sqrt[2]{\frac{1}{a^3}} = \sqrt[2]{\frac{1}{10^{-21}}}$ .4,1361232.10^{-15} = **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}.$\sqrt[2]{\frac{1}{r^3}}$ ← eV and is in the Smallest acceleration Space-cave $a_\gamma = 1.10^{-15}$ m where issues $f_\gamma = 3{,}1622776.10^{28}$ H.

5... For the Beyond Planck`s length Spin-Energy is → $\mathbf{E} = [\ \Phi \frac{\sigma}{4\pi r}\ ] . \bar{B} \equiv \frac{|B|^2}{2\pi^2 r^4}$ ←

6... The Resonance-Energy for caves is $\mathbf{E_R} = \frac{1}{a^2}[\frac{4\pi^2}{c^2} + \frac{L^2}{2m}] = \frac{1}{a^2}[\frac{4\pi^2}{c^2} + \frac{S^2}{2m}]$ and is a **Signal**

7... From **Lorentz-Force** $\mathbf{F} = \bar{q}\ \bar{v}x\bar{B}_F = \frac{m.v^2}{r}$ equation , and from **Cave-Spin** S = r m v , then Force/cave ≡ $\bar{q}\,\bar{B}\,r = mv$, $\bar{q}\,\bar{B} = \frac{S}{r^2}$,Common-Force/cave $\bar{q}\,\bar{B}\,c = \frac{c.S}{r^2}]$, originating E-Caves

i.e. **Forces** $\mathbf{Q_+} = [\frac{c.S}{r^2}] = \frac{2{,}9978.10^{8}.[5{,}691952.10^{-34}]}{[1{,}602.10^{-19}].\ \mathbf{r}^2} = 10{,}649939.10^{-7}.[\frac{1}{r^2}]$ eV ...(Cave-Force)

The Force in Charged-Particle , related to their Cave **r** (m) ,

1-Particle r = 1.10^{-7} m → $\mathbf{Q_{-7}} = 1{,}0649939.10^{-6}.[\frac{1}{[10^{-7}]^2}] = 10{,}65.10^{7}$ eV.
2-Particle r = 1.10^{-8} m → $\mathbf{Q_{-8}} = 1{,}0649939.10^{-6}.[\frac{1}{[10^{-8}]^2}] = 10{,}65.10^{9}$ eV.
3-Particle r = 1.10^{-9} m → $\mathbf{Q_{-9}} = 1{,}0649939.10^{-6}.[\frac{1}{[10^{-9}]^2}] = 10{,}65.10^{11}$ eV.
4-Particle r = 1.10^{-10} m → $\mathbf{Q_{-10}} = 1{,}0649939.10^{-6}.[\frac{1}{[10^{-10}]^2}] = 10{,}65.10^{13}$ eV.
5-Particle r = 1.10^{-11} m → $\mathbf{Q_{-11}} = 1{,}0649939.10^{-6}.[\frac{1}{[10^{-11}]^2}] = 10{,}65.10^{15}$ eV.
6-Particle r = 1.10^{-12} m → $\mathbf{Q_{-12}} = 1{,}0649939.10^{-6}.[\frac{1}{[10^{-12}]^2}] = 10{,}65.10^{17}$ eV.
7-Particle r = 1.10^{-13} m → $\mathbf{Q_{-13}} = 1{,}0649939.10^{-6}.[\frac{1}{[10^{-13}]^2}] = 10{,}65.10^{19}$ eV.
8-Particle r = 1.10^{-14} m → $\mathbf{Q_{-14}} = 1{,}0649939.10^{-6}.[\frac{1}{[10^{-14}]^2}] = 10{,}65.10^{21}$ eV.
9-Particle **r = 1.10^{-15} m** ← → $\mathbf{Q_{-15}} = 1{,}0649939.10^{-6}.[\frac{1}{[10^{-15}]^2}] =$ **10,65.10^{23} eV**.

10-Particle r = 1.10^{-16} m $\rightarrow$ $\mathbf{Q_{-16}}$ = $1{,}0649939.10^{-6}.[\frac{1}{[10^{-16}]^2}] = 10{,}65.10^{25}$ eV.

11-Particle r = 1.10^{-17} m. $\rightarrow$ $\mathbf{Q_{-17}}$ = $1{,}0649939.10^{-6}.[\frac{1}{[10^{-17}]^2}] = 10{,}65.10^{27}$ eV.

12-Particle r = $\mathbf{1.10^{-18}}$ **m** $\leftarrow\rightarrow$ $\mathbf{Q_{-18}}$ = $1{,}0649939.10^{-6}.[\frac{1}{[10^{-18}]^2}] = \mathbf{10{,}65.10^{29}\ eV}$.

13-Particle r = 1.10^{-19} m $\rightarrow$ $\mathbf{Q_{-19}}$ = $1{,}0649939.10^{-6}.[\frac{1}{[10^{-19}]^2}] = 10{,}65.10^{31}$ eV.

14-Particle r = 1.10^{-20} m $\rightarrow$ $\mathbf{Q_{-20}}$ = $1{,}0649939.10^{-6}.[\frac{1}{[10^{-20}]^2}] = 10{,}65.10^{33}$ eV.

15-Particle r = 1.10^{-21} m $\rightarrow$ $\mathbf{Q_{-21}}$ = $1{,}0649939.10^{-6}.[\frac{1}{[10^{-21}]^2}] = 10{,}65.10^{35}$ eV.

16-Particle r = 1.10^{-22} m $\rightarrow$ $\mathbf{Q_{-22}}$ = $1{,}0649939.10^{-6}.[\frac{1}{[10^{-22}]^2}] = 10{,}65.10^{37}$ eV.

17-Particle r = 1.10^{-23} m $\rightarrow$ $\mathbf{Q_{-23}}$ = $1{,}0649939.10^{-6}.[\frac{1}{[10^{-23}]^2}] = 10{,}65.10^{39}$ eV.

18-Particle r = 1.10^{-24} m $\rightarrow$ $\mathbf{Q_{-24}}$ = $1{,}0649939.10^{-6}.[\frac{1}{[10^{-24}]^2}] = 10{,}65.10^{41}$ eV.

Voltage in caves becomes from **Lorentz-force** $F = \bar{q}\ \bar{v}x\bar{B}_F$, from the Magnetic field $q\ v\ B = mv^2/r \rightarrow q\ B\ r = m\ v = m\ r\ w$, and Energy equation $E = h\ f = F / c = q\ V$ i.e.

Voltage V in a cave **r** is $\rightarrow \mathbf{V} = \frac{\mathbf{h.f}}{\mathbf{q}} = \frac{\mathbf{h}}{\mathbf{2\pi qeV}}\sqrt[2]{\frac{g}{r^3}} = \frac{6{,}62606957.10^{-34}}{2\pi.1{,}602{,}10^{-19}\sqrt{r^3}} = \mathbf{0{,}6582148.10^{-15}}.\sqrt[2]{\frac{g}{r^3}} \leftarrow$

The Voltage in Charged-Particles , and the relation to their **Cave r** (m) is ,

1-Energy in r = 1.10^{-7}m $\rightarrow$ $\mathbf{V_{-7}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-7}]^3}} = 6{,}518653.10^{-5}$ eV.

2- Energy in r = 1.10^{-8} m $\rightarrow$ $\mathbf{V_{-8}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-8}]^3}} = 2{,}061375.10^{-3}$ eV.

3- Energy in r = 1.10^{-9} m $\rightarrow$ $\mathbf{V_{-9}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-8}]^3}} = 6{,}518653.10^{-2}$ eV

4- Energy in r = 1.10^{-10} m $\rightarrow$ $\mathbf{V_{-10}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-10}]^3}} = 2{,}061375.10^{0}$ eV.

5- Energy in r = 1.10^{-11} m $\rightarrow$ $\mathbf{V_{-11}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-11}]^3}} = 6{,}518653.10^{2}$ eV

6- Energy in r = 1.10^{-12} m $\rightarrow$ $\mathbf{V_{-12}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-12}]^3}} = 2{,}061375.10^{3}$ eV.

7- Energy in r = 1.10^{-13} m $\rightarrow$ $\mathbf{V_{-13}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-13}]^3}} = 6{,}518653.10^{4}$ eV

8- Energy in r = 1.10^{-14} m $\rightarrow$ $\mathbf{V_{-14}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-14}]^3}} = 2{,}061375.10^{6}$ eV.

9- Energy in $\mathbf{r = 1.10^{-15}}$ **m** $\rightarrow$ $\mathbf{V_{-15}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-15}]^3}} = \mathbf{6{,}518653.10^{7}\ eV}$

10- Energy in **r** = 1.10^{-16} m $\rightarrow$ $\mathbf{V_{-16}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-16}]^3}} = 2{,}061375.10^{9}$ eV.

11- Energy in **r** = 1.10^{-17} m $\rightarrow$ $\mathbf{V_{-17}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-17}]^3}} = 6{,}518653.10^{10}$ eV

12- Energy in $\mathbf{r = 1.10^{-18}}$ **m** $\rightarrow$ $\mathbf{V_{-18}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-18}]^3}} = \mathbf{2{,}061375.10^{12}\ eV.}$

13- Energy in **r** = 1.10^{-19} m $\rightarrow$ $\mathbf{V_{-19}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-19}]^3}} = 6{,}518653.10^{13}$ eV

14- Energy in **r** = 1.10^{-20} m $\rightarrow$ $\mathbf{V_{-20}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-20}]^3}} = 2{,}061375.10^{15}$ eV.

15- Energy in **r** = 1.10^{-21} m $\rightarrow$ $\mathbf{V_{-21}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-21}]^3}} = 6{,}518653.10^{16}$ eV

16- Energy in **r** = 1.10^{-22} m $\rightarrow$ $\mathbf{V_{-22}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-22}]^3}} = 2{,}061375.10^{18}$eV

17- Energy in **r** = 1.10^{-23} m $\rightarrow$ $\mathbf{V_{-23}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-23}]^3}} = 6{,}518653.10^{19}$ eV

18- Energy in **r** = 1.10^{-24} m $\rightarrow$ $\mathbf{V_{-24}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-24}]^3}} = 2{,}061375.10^{21}$ eV

19- Energy in **r** = 1.10^{-25} m → $\mathbf{V_{-25}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-25}]^3}}$ = $6{,}518653.10^{22}$ eV

20- Energy in **r** = 1.10^{-26} m → $\mathbf{V_{-26}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-26}]^3}}$ = $2{,}061375.10^{24}$ eV

Remarks :

1.. Caves **r** , determine the Voltage V = U Potential energy in caves . The Kinetic - Energy is , $K_E = \frac{mv^2}{2} = \frac{m.GM}{2.R} = \frac{GMm}{2.R}$, or $K_E = (1/2)(-P_E) = -\frac{P_E}{2}$ and → $-P_E = U = 2.K_E$ ← 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 $U = 2.K_E = h f = h / T$ 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 $\mathbf{d = 10^{-17}}$ m then Period $T = \frac{d}{c} = \frac{10^{-17}\,m}{[2{,}998.10^8 m/s]}$ = $\mathbf{3{,}3358.10^{-26}s}$,and the produced Energy in **d** , is $E_Z = \underline{h} / T = \frac{1{,}055.10^{-34}\,J.s}{2.[3{,}3358.10^{-26}s].[1{,}6022.10^{-19}\,J/eV]}$ = 98,84. 10^9 eV ≡ **99 GeV**

2.. From the equation of **Forces** $\mathbf{Q_+} = [\frac{c.S}{r^2}] = 10{,}649939.10^{-7}.[\frac{1}{r^2}]$ eV is seen that Strong and Weak-Forces **Converge** at cave $5{,}546.10^{-16}$ m ,of Voltage $\mathbf{V_{-16} = n}.[1 / r^2] = 2{,}06.10^9$ eV. **to** smaller than , $r < 10^{-15}$ m , caves . The Range of action is analogous to the cave on 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 $E = q V = mc^2/2$ ..(1)

From $B = r\,m\,v = r^2\,m\,w = r^2\,m\,(2\pi f) = \pi^2.r^4\,.f$, then → $m = \pi r^2/2$ ← and (1) becomes $\mathbf{q} = \frac{\pi c^2}{4}[\frac{r^2}{V}] = 7{,}0590672.10^{16}\,.\,[\frac{r^2}{V}]$,V= $0{,}658.10^{-15}.\sqrt[2]{\frac{g}{r^3}}$ and for the three types of Particles,

lepton.. r =10^{-15}m → $\mathbf{V_{Leptons-Ecave}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-15}]^3}}$ = $6{,}5188857.10^7$ eV

$\mathbf{Q_{Leptons-Charge}}$ = $7{,}0590672.10^{16}.\frac{10^{-30}}{[6{,}5188857.10^7]}$ = $\mathbf{1{,}082864\,.10^{-21}}$ C

quark.. r = 10^{-17}m → $\mathbf{V_{Quarks-Ecave}}$ = $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-17}]^3}}$ = $6{,}5188857.10^{10}$ eV

$\mathbf{Q_{Quarks-Charge}}$ = $7{,}0590672.10^{16}.\frac{10^{-34}}{[6{,}5188857.10^{10}]}$ = $\mathbf{1{,}082864\,.10^{-28}}$ C

neutrino.. r =10^{-19}m →$\mathbf{V_{Netrinos-Ecave}}$= $0{,}6582148.10^{-15}.\sqrt[2]{\frac{g}{[1.10^{-19}]^3}}$ = $6{,}5188857.10^{13}$ eV

and $\mathbf{Q_{Neutrinos-Charge}}$ = $7{,}0590672.10^{16}.\frac{10^{-38}}{[2{,}0814579.10^{13}]}$ = $\mathbf{1{,}082864\,.10^{-35}}$ 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 [eV] ² .

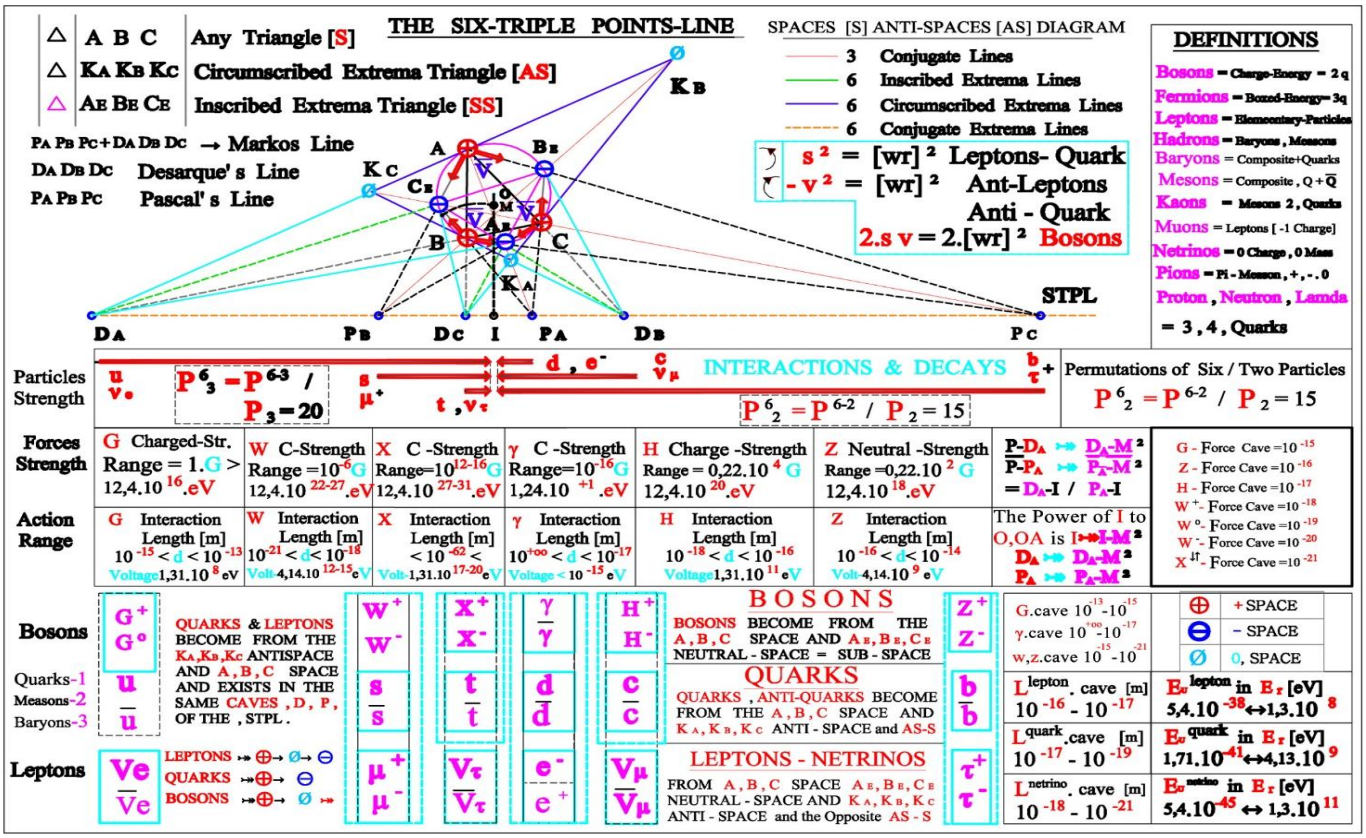
Cave r (m)	**Force - Strength** (eV)	**Voltage** U ≡ V (eV)	**Action-Range** (m) →**In** r
1.. 10^{-13}m	Gluon **G** , $\mathbf{Q_G}$= $12{,}2.10^{14-16}$ eV	$\mathbf{V_G}$ = 10^9 eV	**a** =10^{-15} eV →$10^{-[14-15]}$ m
2.. 10^{-14}m	Weak $\mathbf{Z^o}$, $\mathbf{Q_Z}$= $12{,}2.10^{13}$ eV	$\mathbf{V_Z}$ =10^{10} eV	**a** =10^{-16} eV →$10^{-[16]}$ m
3.. 10^{-15}m	Weak $\mathbf{Z^1}$, $\mathbf{Q_Z}$= $12{,}2.10^{14}$ eV	$\mathbf{V_Z}$ =10^{11} eV	**a** =10^{-16} eV →$10^{-[16]}$ m
4.. 10^{-16}m	Higgs $\mathbf{H^o}$ $\mathbf{Q_H}$= $13{,}6.10^1$ eV	$\mathbf{V_H}$ =10^9 eV	**a** =10^{-15} eV →$10^{-[16]}$ m
5.. 10^{-17}m	Weak $\mathbf{W^+}$ $\mathbf{Q_W}$= $12{,}2.10^{10}$ eV	$\mathbf{V_W}$ =10^9 eV .	**a** =10^{-18} eV →$10^{-[18]}$ m
6.. 10^{-18}m	Weak $\mathbf{W^o}$ $\mathbf{Q_W}$ = $12{,}2.10^9$ eV	$\mathbf{V_W}$ =10^{14} eV	**a** =10^{-19} eV →$10^{-[19]}$ m
7.. 10^{-19}m	Weak $\mathbf{W^-}$ $\mathbf{Q_W}$= $12{,}2.10^{10}$eV	$\mathbf{V_W}$ =10^{15} eV	**a** =10^{-20} eV →$10^{-[20]}$ m
8.. 10^{-20}m	Strong $\mathbf{X^+}$ $\mathbf{Q_X}$ > $12{,}4.10^{28}$ eV	$\mathbf{V_X}$ =10^{17} eV	**a** =10^{-21} eV →$10^{-[20-23]}$ m

5.. Question? **How** Forces as Strength-Voltage **V** , (eV) , Quarks **q** , as Charges (2/3 -1/3).e Leptons ***l*** , as Charges (-1).e and Neutrinos , **ν** ,with 0 Charge , in Caves **D , P** ***Linearly Effect*** (Interact) and How these are ***Connected*** ???

Answer → Charge $_D$ = + $\overrightarrow{DI}$,and **Charge of Point P** is → Charge $_P$= - $\overleftarrow{P_AI}$. (Fig-3-24) i.e. It is proved in [90-91] that , External-Power of all Points on STPL is Related only to their (+) Distance → and (-) Distance ← , from Null-Point **I** , where I is the foot of , **OI ⊥ PD . i.e.** $\mathbf{D_A}$ Content-Charge ≡ $\mathbf{[D_AM]^2}$ ≡ |+→ $[D_AI]$, $\mathbf{P_A}$ Content-Charge ≡ $\mathbf{[P_AM]^2}$ ≡ $[D_AI]$← - | , or **u**-Charge ≡Charge $_{\mathbf{u}}$= $+\overrightarrow{D_AI} = +\frac{2}{3}$, **d**-Charge≡Charge$_{\mathbf{d}}$ = $-\overleftarrow{P_AI} = -\frac{1}{3}$, linear Effect and Confined.

$\mathbf{W^+} = [\rightarrow D_A I\ ] > [\leftarrow P_A I\ ]$, $\mathbf{W^-} = [\rightarrow D_A I] < [\leftarrow P_A I\ ]$, $\mathbf{W^o} = [\rightarrow D_A I] = [\leftarrow P_A I\ ]$ ...(w)

Figure –24 - : The [STPL] Physical-Mechanism -Cave-axis of → Forces and Energy-Caves ←



2h… 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 $\mathbf{F_c} = \mathbf{C}\frac{q_1.q_2}{r^2}$, while the Voltage of cave r , is $\mathbf{V_r} = \mathbf{C}\frac{q_1.q_2}{r}$ and is → $\mathbf{V_r} = \mathbf{F_c}\,.\,\mathbf{r}$ i.e. when Two Particles are in a cave **r** , then exists an Interaction between the two Particles.

The ⊕ Charged-Particle produces an **Electric-field** $\vec{\mathbf{E}}$ **,** which exerts a force $\vec{\mathbf{F}}$ on the other charged Particle creating The-**Constructive** or **Destructive-Interference** in an Homogenous Harmonic vibration Voltage as the Dynamic Matrix [λ M+K] X = 0 , where $\bar{\lambda} = 1/w^2 = 1/\lambda$.

Strong - Forces are created on , **Markos-STPL** , in Pascal`s and Desargues`s Six-Point-Line **.** From Magnetic field $\bar{B}_F = \frac{m.2\pi}{Q_+}$ f , and Centripetal-Lorentz force $\mathbf{F} = \bar{q}\bar{v}.\bar{B}_F = \bar{q}\bar{v}[\frac{2\pi.m}{Q_+}f\ ] =$

$2\pi.\bar{q}\bar{v}[\frac{m}{mg}].f \equiv \frac{mv^2}{r} \equiv \frac{S.v}{r^2}$, and since Spin S = r m $\bar{v}$ then , $2\pi.\bar{q}\bar{v}.[\frac{f}{g}] = \frac{\bar{v}.S}{r^2}$ **,** or $\frac{2\pi\bar{q}}{g}\ r\ f = \frac{S}{r}$

and since frequency $f = \frac{\sigma.\Phi}{2\pi r}$ then → $\frac{\bar{q}(\sigma\Phi)}{g} = \frac{S}{r}$ **,** which becomes → $\mathbf{r}\,.\boldsymbol{\sigma}\,.\,\bar{\mathbf{q}}_{\mathbf{Cave}} = \frac{S.g}{\Phi}$ ←

From Angular-Momentum-Vector $\bar{\mathbf{B}} = \pi^2.r^4.f \equiv$ **Spin** $\pm\ \bar{S}$ and is equal to $\frac{\pi r^3\sigma}{2}[1+\sqrt{5}\,] \equiv$

$\pi r^3.\ \sigma\Phi \equiv [\frac{h}{2\pi}] \equiv \frac{2L}{2\pi f}$, or Charge of cave , **r** , is → $\bar{\mathbf{q}}_{\mathbf{Cave}} = \frac{\bar{S}.g}{\sigma.r.\Phi} \equiv \frac{\bar{S}.g}{\bar{c}.r}$ ← ….(q) i.e.

Above equation (q) relates the Inside existing **Spin S ,** of cave **r** , with force **F ,** which creates ***Charge*** $\bar{\mathbf{q}}$. These Charges , $\pm\ \bar{\mathbf{q}}$, { following Spin $\bar{\mathbf{S}}$ are ⊕ or ⊖ } when are found in STPL Mechanism create the Coulomb-forces , **F** , which are either Repulsion or Attractive , **and which Forces Joint** the **Charges** , $\pm\ \bar{\mathbf{q}}$, independently of **Charge-Type** and so is done **The-Origination of the Six-Forces and Anti-Forces** .

The moving Charged Particle , ⊕ or ⊖ , produces a **Magnetic-field** $\bar{\mathbf{B}}_{\mathbf{F}}$,which exerts a Force $\vec{\mathbf{F}}$ on other moving charge . The Force $\vec{\mathbf{F}}$ of these Charges is always Perpendicular to the Direction of their Velocity vector so ***Velocity-magnitude*** does not change , while the ***Direction*** of the Velocity vector changes .In this way is created an ***Electromagnetic Wave*** **in cave r** with Wavelength λ = 2r , on the Two or more Possible nodes of the Wavelength , i.e.

It is ***a Standing-Wave*** , with the **Two ± Charges** at their **Two-nodes** .

The Double-Orbital-Periodic motion [⊕<→⊖] in above Material-Point is the Eternal-Plane Curve motion of the ⊕ constituent to the ⊖ 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 $\mathbf{S} = \bar{B}$, so Issues for Spin $|\bar{B}| = \bar{r}\ m\ \bar{v} = \bar{r}.[m\ \bar{v}] = \sqrt{\bar{r}^2 + m^2\,\bar{v}^2}$, since $\bar{r} \equiv$ **The Space** , and which is Perpendicular to , $m\bar{v} \equiv$ **The Energy Part** , issuing $\rightarrow \bar{r} \perp \uparrow m\,\bar{v}$, or $\rightarrow \uparrow$. ***Above indicates*** **, the Origination of everything ,** ***through*** **The Existence of Opposites , [⊕→⊖] , in all Space levels independently of magnitudes and Orientations** .

The **Two-Types of charges** $\bar{q} \rightarrow \oplus$, ⊖ ,consist the Sources of Electromagnetic fields while ***masses*** for Gravitational field , and now from Centrifugal-Force F_g , ***the Impedance*** ≡ ***mass*** of Planck-Cave L_P . Above Dual Property of Spin $\bar{S}$, 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 **Constructive [⊕→(+)←⊕]** or **[⊖→(+)←⊖] ,** and to the **Destructive [⊕→(-)→⊖] 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 ⊕ Breakage being alternative at Space-Points **A , B , C** → **Attacks** to the ⊖ **Charges** at Anti-Space-Points $\mathbf{K_A}$,$\mathbf{K_B}$,$\mathbf{K_C}$, and forms **Leptons** { e^-, μ^+, τ^+, ν_e , ν_μ , ν_τ } and **Quarks** {**d , s , b , u , c , t** } **, on STPL** Points $\mathbf{P_A}$, $\mathbf{P_B}$, $\mathbf{P_C}$--$\mathbf{D_A}$, $\mathbf{D_B}$, $\mathbf{D_C}$ respectively.

2..Because the ⊕ Breakage **Attacks =≫**to ⊖ **Charge** thus Anti-Particles are Generated only from the Opposite-motion , *opposite direction* , in their Conductors . D,P → I ← P,D

3.. From [91] The Geometry of STPL line allows Six Quantities on the three Loads as The **Artificial 3-Phase-Star**-Circuit and The-**Physical 6-Phase-Delta**-Circuit for $\mathbf{Q}_{\overrightarrow{AK_A}}$, and $\mathbf{Q}_{\overrightarrow{A_EK_A}}$ **,** Elementary-Particles are launched at $\mathbf{P_A}$ and $\mathbf{D_A}$ Points of STPL .

4.. **BOSONS** are formed **Axially** to Common-circle in Sub-Space A_E , B_E , C_E , such for Space , A , B , C , as for Anti-Space K_A , K_B , K_C , and thus acquire their Spin and , ***Instead of Charge*** → a **Voltage-Force** ≡ **Motion-in-Magnet** ≡ **Material-Point** from their Conductors , AP_A , AD_A , as ⊕ Breakage **Attacks =≫** to , ∅ **Zero**-Charge , ⊕ **=≫**∅ **=≫** $\mathbf{Q_+} = \frac{g.S}{2\pi r^2}$ and are Launched with $\mathbf{Q}_{\overrightarrow{AK_A}}$, $\mathbf{Q}_{\overrightarrow{A_EK_A}}$ Quantities at $\mathbf{P_A}$ **,** $\mathbf{D_A}$ Points of the STPL line with the (w) above Linear-relation.

3h... The Interactions and Decays , of Cosmic Particles :

A→[L+Q **] Interactions in Space , Anti-Space for Leptons-Quarks Origination .**

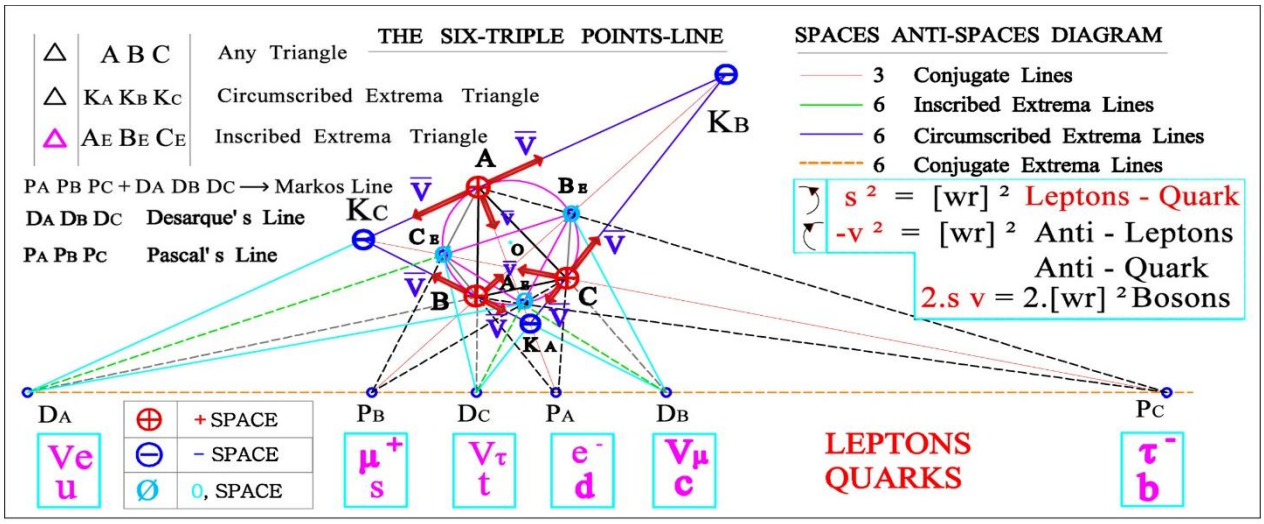


Figure - 25 - : The Physical-Rotor in [STPL]-Mechanism Produces at Pascal`s and Desargues Points $\mathbf{P_A}$, $\mathbf{P_B}$, $\mathbf{P_C}$ --- $\mathbf{D_A}$, $\mathbf{D_B}$, $\mathbf{D_C}$, The **Leptons** and **Quarks** :

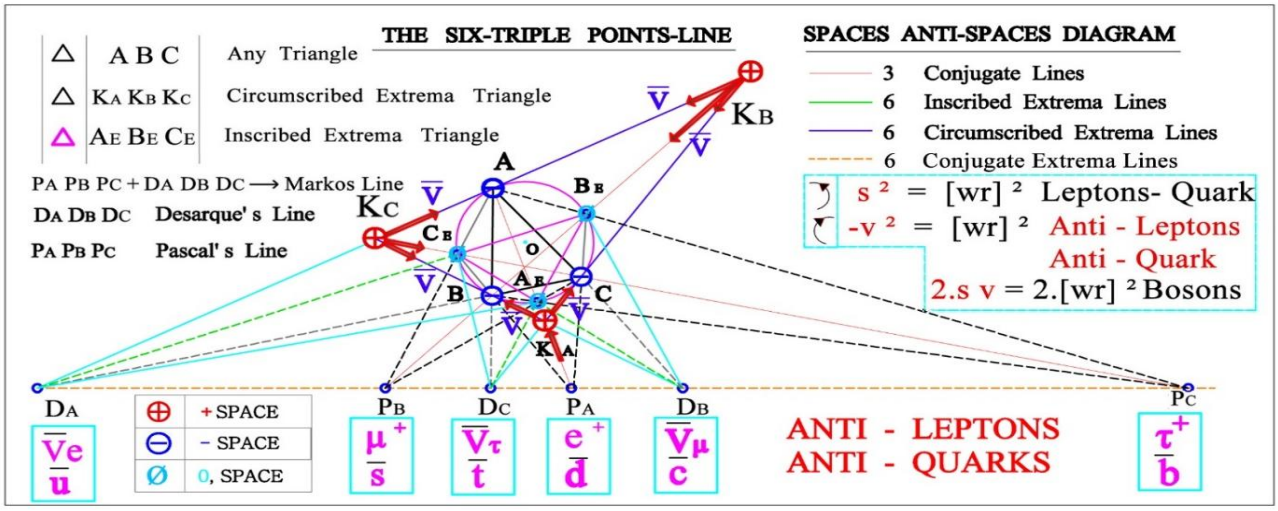
1A.. Breakage $\mathbf{s^2} = +|\bar{v}|^2 = |\bar{w}xr\,\therefore|^2 \equiv \oplus$ being at Point **A** → **Attacks** Breakage **Charge ,-** $\mathbf{s^2} = \ominus$ at Point $\mathbf{K_A}$ with an **Impressed-Force** $\mathbf{Q}_{\overrightarrow{AK_A}} = Z_{AK_A}\frac{d}{r} \equiv |\bar{e}|\ x\ \frac{3}{3}$, with $\bar{c}$ velocity and forms ***electron*****-Lepton** { e^-} in Conductor $\left[\frac{d=AK_A}{AK_A}\right] = \frac{3}{3}$, as $\frac{3|\bar{e}|}{3}$, and being at Point $\mathbf{A_E}$ forms ***down*****–Quark** { **d** } in Conductor $\left[\frac{d=A_EK_A}{AK_A}\right]$, as $\frac{|\bar{e}|}{3}$, and Both the Work-Energy-Storages

$\mathbf{Q}_{\overrightarrow{AK_A}} \equiv |\bar{e}| \times \frac{3}{3}$, $\mathbf{Q}_{\overrightarrow{A_E K_A}} \equiv \frac{|\bar{e}|}{3}$, are Launched-Off the common-circle at the Pascal Point , $\mathbf{P_A}$, of the [STPL] line.

2A.. The ⊕ Breakage being at Point **A** → **Attacks the** ⊖ **Charges** at Points $\mathbf{K_B}$, $\mathbf{K_C}$ ← with the **Impressed-Force** $\mathbf{Q}_{\overrightarrow{AK_B}} = Z_{AK_B} \frac{d}{r} \equiv |\bar{e}| \times \frac{1}{1}$, with $\bar{c}$ velocity forming the ***electron -neutrino*-Lepton** $\{\nu_e\}$ in Conductor $[\frac{d=AK_B}{AK_A}] = \frac{1}{1}$ as $\frac{0|\bar{e}|}{0}$, and in $[\frac{d=AK_C}{AK_A}] = \frac{2}{3}$ ***up*-Quark** { **u** } in Conductor $[\frac{d=AK_C}{AK_A}] = \frac{2}{3}$, as $\frac{2|\bar{e}|}{3}$, and Both the Work-Energy-Storages $\mathbf{Q}_{\overrightarrow{AK_B}} \equiv \frac{1|\bar{e}|}{3} \equiv$ Charge $_{\nu e} = +\overrightarrow{D_A I} = \frac{1}{3}$, $\mathbf{Q}_{\overrightarrow{A K_C}} \equiv \frac{2|\bar{e}|}{3} \equiv$ Charge $_{u} = +\overrightarrow{D_A I} = +\frac{2}{3}$, are Launched -Off the common-circle at the Desargues Point , $\mathbf{D_A}$, of the [STPL] line . as → ν_e- Charge $\equiv +\overrightarrow{D_A I} = +\frac{1e}{3}$, **u-** Charge $\equiv +\overrightarrow{D_A I} = +\frac{2e}{3}$.

B→[- L-Q] Interactions in Space ,Anti-Space for Anti Leptons -Anti Quarks Origination

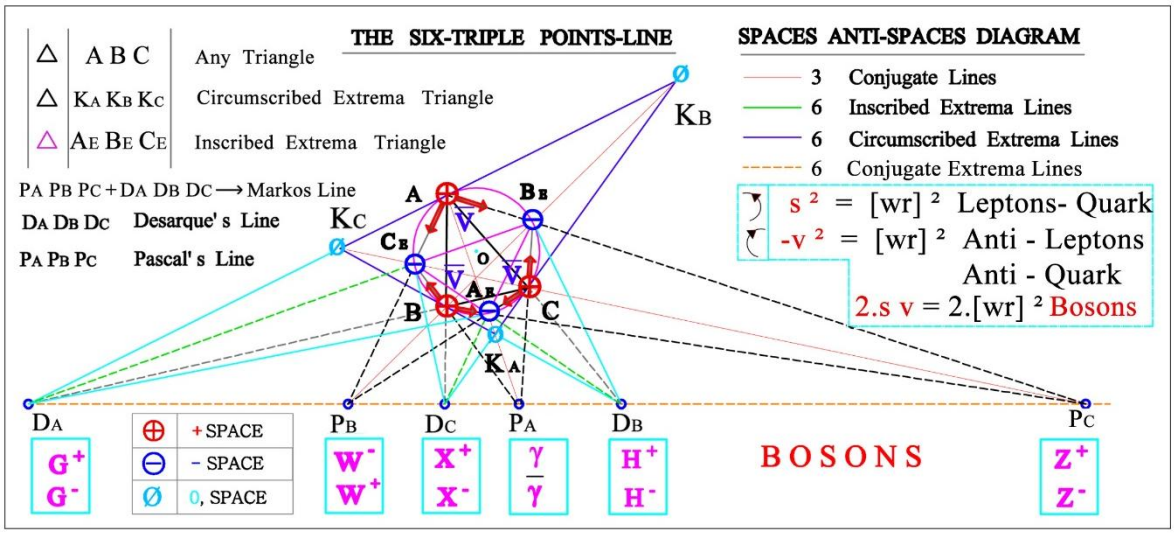
Figure - 26 - : The [STPL] line Machine Produces the Anti-Leptons and Anti-Quarks :



1A.. Breakage $\mathbf{s^2} = +|\bar{v}|^2 = |\bar{w} x r \therefore|^2 \equiv$ ⊕ being at Point **A** → **Attacks** Breakage **Charge, -s² =** ⊖ at Point $\mathbf{K_A}$, and forms $\mathbf{Q}_{\overrightarrow{AK_A}}$, $\mathbf{Q}_{\overrightarrow{A_E K_A}}$ Quantities which are Launched at Points $\mathbf{P_A}$ of [STPL] line as → ***electron*-Lepton** $\{e^-\}$ and ***down*–Quark** { **d** } ← Simultaneously[F-3] Breakage $\mathbf{s^2}$ **,** being at Point $\mathbf{K_A}$ **, Attacks** Breakage **Charge (- s²)** at Point **A On-Opposite** Conductors $[\frac{d=K_A A}{A K_A}] = \frac{-1}{1}$, and at Point $\mathbf{A_E}$ $[\frac{d=K_A A_E}{A K_A}] = \frac{-1}{3}$, forms the Energy-Quantities as $\mathbf{Q}_{\overrightarrow{K_A A}} \equiv -|\bar{e}| \times \frac{3}{3}$, ***Positron*-Lepton** $\{e^+\}$ **,** and $\mathbf{Q}_{\overrightarrow{K_A A_E}} \equiv -|\bar{e}| \times \frac{1}{3}$, ***Anti-down*–Quark** $\{\bar{d}\}$. which are Launched-Off the common-circle at the Pascal Point , $\mathbf{P_A}$, of the [STPL] line.

2A.. The ⊕ Breakage being at Point **A** → **Attacks the** ⊖ **Charges** at Points $\mathbf{K_B}$, $\mathbf{K_C}$ ← and forms $\mathbf{Q}_{\overrightarrow{AK_B}}$, $\mathbf{Q}_{\overrightarrow{A K_C}}$ Quantities which are Launched at Point **,** $\mathbf{D_A}$ of the [STPL] line as → ***electron -neutrino*-Lepton** $\{\nu_e\}$ **,** and ***up*-Quark** { **u** } ← Simultaneously[F-29] ⊕ Breakage $\mathbf{s^2}$ being at Points , $\mathbf{K_B}$ **,** $\mathbf{K_C}$ **, Attacks** Breakage **Charge (- s²)** at Point **A** , **On-Opposite** Conductors $[\frac{d=K_B A}{A K_A}] = \frac{-1}{1}$,and $[\frac{d=K_C A}{A K_A}] = \frac{-2}{3}$,forming the Energy Quantities $\mathbf{Q}_{\overrightarrow{K_B A}} \equiv -\frac{1|\bar{e}|}{1}$, $\mathbf{Q}_{\overrightarrow{K_C A}} \equiv -\frac{2|\bar{e}|}{3}$, the ***Anti-electron -neutrino*-Lepton** $\{\bar{\nu}_e\}$, and the ***Anti-up*-Quark** { $\bar{u}$ } which are Launched-Off the common-circle at the Desargues Point $\mathbf{D_A}$, of the [STPL] line .

C→[F-V] Interactions in Space Anti-Space , for Forces and Voltage Origination :
Figure - 27 - : The [STPL] line Machine Produces the **Force carriers** as **Material-Points :**
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 [⊕] Charge Attacks [⊖] 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 so launched into the Pascal **P** , Desargues **D** , Points which occupy a different **Energy-Magnitude** and **Voltage** . The Two Positions of these [⊕] , [⊖] Charges exist in Standing and Travelling Wave , since there are only Two-Positions , ***possible-nodes*** , in a Wavelength $\lambda = 2r$.

As in **Duality-Photon** → $\{ \bar{c} . \boxed{\bar{f}_n} + \bar{c} . \mathbf{f_n} \}$ ← ≡ Stationary- Storage in Standing-Wave + Travelling -Wave → Particle + Wave ← *therefore* **Force F** is the Space → Anti-Space influence of the [⊕] , [⊖] Charges at the Two - Positions of Wavelength $\lambda = 2r$.
The Two Positions in Wavelength follow all laws of Mechanics and the Cauchy-Stresses.

From **Lorentz-Force** $\mathbf{F} = \bar{q}\ \bar{v}x\bar{B}_F = 2\pi.\bar{q}\bar{v}.[\frac{.f=1}{g}]$ equation , and from **Nutation-Force** $\mathbf{F} = [\frac{\bar{v}.S}{r^2}]$ is found the Common **Charge** $\bar{q} = Q_+ = [\frac{g.S}{2\pi r^2}]$, which originates Forces as ,

Forces $Q_+ = [\frac{g.S}{2\pi r^2}] = \frac{9{,}8076754.[5{,}691952.10^{-34}]}{2.\pi.[1{,}602.10^{-19}].\ r^2} = 5,\ 5457194.10^{-15}\ [\frac{1}{r^2}]$ eV ...(***Forces***)

Voltage in caves becomes from **Lorentz-force** $F = \bar{q}\ \bar{v}x\bar{B}_F$, from the Magnetic field $q\ v\ B = mv^2/r \rightarrow q\ B\ r = m\ v = m\ r\ w$, and Energy equation $E = h\ f = F / c = q\ V$ i.e.

Voltage V in a cave **r** is → $\mathbf{V = \frac{h\ f}{eV} = \frac{h}{eV}\sqrt[2]{\frac{g}{r^3}} = \frac{6{,}62606957.10^{-34}]}{[1{,}602.10^{-19}].\sqrt{r^3}} = 4{,}1356586.10^{-15}.\sqrt[2]{\frac{g}{r^3}}}$ ←

All Particles and Forces End in STPL , Pascal`s , $P_A$ , and Desargues`s Points , D_A .
AK_C , Creates the , **+ Force** $G^+ = \oplus \rightarrow \varnothing$, and **$AK_B$** $= \oplus \leftarrow \varnothing$, Creates the , **– Force** G^-.
The Why Wave-Birefringence is related to Particles-Chromodynamics .
The derivation of any two waves is as $W_1 = A.\cos(kx - wt)$, $W_2 = A.\cos(kx - wt + \varphi)$ by Summation $W_1 + W_2 = A.\cos(kx - wt) + A.\cos(kx - wt + \varphi) \equiv 2A.\cos(\frac{\varphi}{2}).\cos[kx - wt + \varphi/2]$
Constructive-Interference happens if the Phase difference is an Even multiple of φ , or $\varphi \rightarrow -4\pi , -2\pi , 0 , 2\pi , 4\pi , \ldots 2N\pi$, and or → $\mathbf{W_C \equiv W_1 + W_2 = 2A.\cos[kx - wt]}$← and
Destructive-Interference happens if the Phase difference is an Odd multiple of φ , or $\varphi \rightarrow -3\pi , -1\pi , 0 , 1\pi , 3\pi , \ldots . (2N-1).\pi$, and or → $\mathbf{W_D \equiv W_1 + W_2 = 0}$
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 the Principal - Strains , and consequence to Stresses , as → $\delta = d\ [n_1 - n_2]$ ..(1) ,where **d** , is the thickness of the material,
When a ray of light , of wavelength λ , and Electromagnetic components R_1 , R_2 , passes through a cave , **r** ,then Intensity → $I = [R^2{}_1 + R^2{}_2].\sin^2(\frac{\pi\delta}{\lambda})$, and when I = 0 then $\sin^2[\frac{\pi\delta}{\lambda}] = 0$
i.e. **when** $\delta = 0 , \delta = 1, \delta = 2$, **or generally** $\boldsymbol{\delta = N}$ **,where** $\boldsymbol{\varepsilon_1 - \varepsilon_2 = \delta/2r.k = r\ [n_1 - n_2]}$, and the **Relative Retardation** , $\boldsymbol{\delta = N\lambda = r.\cos\varphi}$, **where** $\boldsymbol{\varphi = 0 \approx 90^o}$ or , $\boldsymbol{\delta = r}$, $\boldsymbol{\delta = \pi r / 2}$ ...(2)
Primary-Particles are considered Spherical ,so **Merging** happens on Semicircle , → □→ ,and

on the Anti –Semicircle as , → □ → . In both cases , δ = Nλ = r.cos[φ = 0 − 90°] .
In case of a **Constructive-**Interference ,⊕→⊕ ≡⊕→[□ ⊕]≡⊕ → (δ ⊕)≡⊕ (cos φ. **r** ⊕)
In case of a **Constructive-**Interference ,⊖→⊖ ≡ ⊖→[□⊖] ≡ ⊖→ (δ ⊖)≡⊖ (cos φ. **r** ⊖)
In both cases Energy E = h f ≡ h/T ≡ h c / λ , and λ = δ / N so E = h N c / λ ......(3)
From (3) is seen that the Number of colors is infinite N =1 → ∞ , and so Color is a form of Strong charge . From Voltage $V_r = F_c . r = \lambda r$, where , λ = c / f , is the wavelength .
From Unit-relation N λ = [c / f] = $c/\sqrt[2]{\frac{1}{g.r^3}} = c\sqrt{g.r^3}$ = 2.99819938 .10^8. √9,8076754)$\sqrt[2]{r^3}$ =
9,3895231.10^8.$\sqrt[2]{r^3}$. N , and for r =10^{-17} m (*the quarks*) ,then Wavelength λ=N.9,3895231.10 ^{8}.
$^2\sqrt{10^{-51}}$ = N.29,692278.10 $^{8-26=-18}$, or → λ = N.29,692278.10^{-18} m , so N =2, 4, 6 , in caves
r =10^{-17} m , exists the three Wavelengths → **λ ≡ 29,692278.10^{-18}** m
→ λ ≡ **118,76911 .10^{-18}** m
→ λ ≡ **178,15366 .10^{-18}** m , **for Color-Charges**
r =10^{-18} m , exists the three Wavelengths → **λ ≡ 9,3895231. 10^{-19}** m
→ λ ≡ **18,779046 . 10^{-19}** m
→ λ ≡ **37,558092. 10^{-19}** m , **for Color-Charges**
r =10^{-19} m , exists the three Wavelengths → **λ ≡ 29,692278.10^{-21}** m
→ λ ≡ **118,76911. 10^{-21}** m
→ λ ≡ **178,15366 .10^{-21}** m , **for Color-Charges**
The Table of , STPL , Breakages [± s² = ± (wr)²],[∇i = 2(wr)²] and Cosmic-Particles.
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

STPL / Forces	**F**	→	**D_A** **G**	**P_B** **W**	**D_C** **X**	**(I)**	**P_A** **γ**	**D_B** **H**	**P_C** **Z**
Positive (+) Charge-Magnitude / →						| \ ← **Negative**	**(-) Charge**		
Charge	**$Q_\pm$**	→	$\frac{2}{3}$	$-\frac{1}{3}$	$\frac{2}{3}$	.	$-\frac{1}{3}$	$\frac{2}{3}$	$-\frac{1}{3}$
Quarks.	**q**	→	u	s	t	.	d	c	b
Anti-Quarks	$\bar{q}$	→	$\bar{u}$	$\bar{s}$	$\bar{t}$	.	$\bar{d}$	$\bar{c}$	$\bar{b}$
Charge	**$Q_\pm$**	→	0	−1	0	.	−1	0	−1
Leptons.	**L**	→	ν_e	μ^+	ν_τ	.	e^-	ν_μ	τ^+
Anti-Leptons	$\bar{L}$	→	$\overline{\nu_e}$	$\bar{\mu}$	$\overline{\nu_\tau}$	.	$\overline{e^+}$	$\overline{\nu_\mu}$	$\bar{\tau}$

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
It was referred that two **u**-Charge ≡ {→ $D_A I = \frac{+2}{3}$ **}** , one **d**-Charge ≡ {← $P_A I = \frac{-1}{3}$ } ,
are Effecting linearly and Connected by linear-Forces , **as** →[u-d-u]← with Resultant-charge
2 [$\frac{+2}{3}$]+$\frac{-1}{3}$ = $\frac{+3}{3}$ = **+ 1e** ≡ Charge **C_e** =1,602.10^{-19} C in cave **a** = 5,0.10^{-17} m , and are ,
W^+ = [→D_AI] > [← P_AI] , **W^-** = [→ D_AI] < [← P_AI] , **W^o** = [→ D_AI] = [← P_AI] …(w)
It was shown [Page-55] that , **Forces between** the **Opposites Equilibrium-Linearly ,** as this is for two or three Particles →[u-c̄]← or , $\frac{2}{3}$ e - $\frac{2}{3}$ e = 0 , ←[d-u-d]→ where is the Resultant 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 Dynamic-Strip-Polygon doesn`t close . ↔

Electric-Force ***is the Dominant where Particles are responding to the*** **Constructive [⊕→(+)←⊕]** or **[⊖→(+)←⊖]** ***, and to*** **Destructive [⊕→(-)→⊖] Interference as** ,
Constructive-Interference [⊕→⊕=⊕⊕]≡$CI^{+,+}_{=+1}$ ≡ **W^+**, [⊖→⊖=⊖⊖]≡ $CI^{-,-}_{=0-}$≡ **W^-,**
[⊕ → = ⊕] ≡ $CI^{+,\to}_{=+n}$ ≡ **W^{++}** ….3-Types of CI-Forces .
Destructive - Interference [⊕ → ⊖ =0_+] ≡ $DI^{+,-}_{=0+}$≡ **Z^+** , [⊕ → ⊖ = 0] ≡ $DI^{+,-}_{=0}$ ≡ **Z^o ,**
[⊕ → ⊖ =0 _] ≡ $DI^{+,-}_{=0-}$≡ **Z^-** ….3-Types of DI-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
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 , and is → **V_r = F_c . r** ← …(v)
i.e. when Two Particles are in a cave , **r** , then exists an Interaction between the two Particles .
The ⊕ Charged-Particle produces an **Electric-field** $\overleftarrow{E}$ which exerts a force $\overleftarrow{F}$ on the other charged Particle creating the-Constructive or the Destructive Interference in an Homogenous Harmonic vibration Voltage , as Dynamic Matrix [λ M+K] X = 0 where $\bar{\lambda}$ = 1/w² = 1/λ .
The moving Charged Particle , ⊕ or ⊖ , produces a **Magnetic-field** $\overleftarrow{B}$,which exerts a Force $\overleftarrow{F}$ on other moving charge . The Force $\overleftarrow{F}$ 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. ***a Standing-Wave*** , with the Two ± Charges at the two-nodes .
The Permutations-**Per-Two** for Six **Leptons** is 15 , and the same 15 for the Six Anti-Leptons.

$\mathbf{P}le\,{}^{6}_{2} \rightarrow e^{-}\mu^{+}, e^{-}\tau^{+}, e^{-}\nu_e, e^{-}\nu_\mu, e^{-}\nu_\tau - \mu^{+}\tau^{+}, \mu^{+}\nu_e, \mu^{+}\nu_\mu, \mu^{+}\nu_\tau,$
$\tau^{+}\nu_e, \tau^{+}\nu_\mu, \tau^{+}\nu_\tau, \nu_e\nu_\mu, \nu_e\nu_\tau, \nu_\mu\nu_\tau =$ **15**-Ple

$\mathbf{P}l\bar{e}\,{}^{6}_{2} \rightarrow e^{+}\bar{\mu}, e^{+}\bar{\tau}, e^{+}\nu_e, e^{+}\nu_\mu, e^{+}\nu_\tau - \bar{\mu}\tau^{+}, \bar{\mu}\bar{\nu_e}, \bar{\mu}\bar{\nu_\mu}, \bar{\mu}\bar{\nu_\tau}$
$\bar{\tau}\bar{\nu_e}, \bar{\tau}\bar{\nu_\mu}, \bar{\tau}\bar{\nu_\tau}, \bar{\nu_e}\bar{\nu_\mu}, \bar{\nu_e}\bar{\nu_\tau}, \bar{\nu_\mu}\bar{\nu_\tau} =$ **15**-Ple

The Permutations-**Per-Two** of the Six **Quarks** is 15 ,and the same 15 for the Six Anti-Quarks.

$\mathbf{P}qu\,{}^{6}_{2} \rightarrow u\,s, u\,t, u\,d, u\,c, u\,b - s\,t, s\,d, s\,c, s\,b - t\,d, t\,c, t\,b - d\,c, d\,b, c\,b =$ **15**-P

$\mathbf{P}q\bar{u}\,{}^{6}_{2} \rightarrow \bar{u}\,s, \bar{u}\,\bar{t}, \bar{u}\bar{d}, \bar{u}\,\bar{c}, \bar{u}\,\bar{b} - \bar{s}\,\bar{t}, \bar{s}\,\bar{d}, \bar{s}\,\bar{c}, \bar{s}\,\bar{b} - \bar{t}\,\bar{d}, \bar{t}\,\bar{c}, \bar{t}\,\bar{b} - \bar{d}\,\bar{c}, \bar{d}\,\bar{b}, \bar{c}\,\bar{b} =$ 15-P

The Permutations-Per-Three , Not the same , of the Six Quarks is **20-P**
while with repetition is $PR\,{}^{6}_{3} = [7^3+1]/2 =$ **172** as below .

$\mathbf{P}\,{}^{6}_{3} \rightarrow u\,s\,t, u\,s\,d, u\,s\,c, u\,s\,b - u\,t\,d, u\,t\,c, u\,t\,b - u\,d\,c, u\,d\,b, u\,c\,b -$
$s\,t\,d, s\,t\,c, s\,t\,b, s\,d\,c, s\,d\,b, s\,c\,b - t\,d\,c, t\,d\,b, t\,c\,b, d\,c\,b =$ **20**-P

$\mathbf{PR}\,{}^{6}_{3} \rightarrow u\,u\,u, u\,u\,d, u\,d\,d, d\,d\,d, u\,d\,s, u\,u\,s, u\,d\,s, d\,d\,s, u\,s\,s, d\,s\,s, s\,s\,s, ., ., ., ,$

$\mathbf{P}\,{}^{6}_{2}$, $\mathbf{P}\,{}^{6}_{3}$, $\mathbf{P}qu\,{}^{6}_{2}$, $\mathbf{P}q\bar{u}\,{}^{6}_{2}$, $\mathbf{P}\,{}^{6}_{3}$, $\mathbf{PR}\,{}^{6}_{3}$, and generally $\mathbf{P}^{6}_{n}$ are the **Basic-Permutations of the Primary-Particles** , while others are Composite , for Interactions and Decays .

4h... AN NEW INTERACTION - METHOD based on – 2f-3f –Page →49-57 :
Interaction of Electron $\mathbf{e^-}$,and Electron-neutrino $\boldsymbol{\nu_e}$,is→ $\mathbf{e^- \nu_e \equiv [-1\text{-}0\text{+}W^-] \equiv \Sigma}\,{}^{[\nu_e\, e^-]}_{D_A > P_A}$
The Summation of E-neutrino [$\boldsymbol{\nu_e}$**=-0]** in Cave P_A ,**attacks** >> Electron [$\mathbf{e^-}$=-1] in Cave P_A
Of STPL as (v) **, and** creates the Constructive-Interference $[\ominus \rightarrow \ominus = \ominus\ominus] \equiv CI\,{}^{-,-}_{=0-} \equiv \mathbf{W^-}$**.**
The Process from measurements ,
1… DATA .
Electron-mass $\mathbf{m_e}$ =9,11.10^{-31} Kg ,Charge $\mathbf{q_e}$ =1,602.10^{-19} C , Diameter **a** = 5,0.10^{-17} m E-neutrino $\mathbf{m_{ev}}$ = 3,922.10^{-36}Kg ,Charge $\mathbf{q_{ev}}$ =1,602.10^{-19} C, Diameter **a** = 5,0.10^{-18} m
From $\mathbf{m_e}$ = 0,511.10^6 eV/c^2 = (17,826614. 10^{-37}).0,511. 10^6Kg = 9,1094.10^{-31} Kg
$\mathbf{m_{ev}}$ = 22.10^{-7} MeV/c^2= 22.10^{-7}.10^6eV/c^2= 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+δ) }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 Parallel-Harmonic-Resistors-Connection** as → [ν_e e^-]
The System Total-Harmonic-mass ≡ M_T is → $\frac{1}{M_T} = \frac{1}{m_e} + \frac{1}{m_{Ve}} = \frac{10^{32}}{0,911} + \frac{3.10^{32}}{0,0003922} =$
$= \frac{0,9113922.10^{32}}{0,0003572} = \frac{10^{32}}{0,0003919}$ and , M_T = 0,0003919.10^{-32} Kg = 3,919.10^{-36} Kg .
The System Total- Harmonic-Charge ≡ $Q_T \equiv q_e + q_{ev}$ = - 1,6022.10^{-19} + 0
and the Resonance-Charge is Q_T = -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 $1 = k.\mathbf{f}^2{}_o\ \mathbf{a^3}$. Their common k , is the Constant-Energy → $k = 4\pi^2\, m\, f^2{}_p = \frac{1}{\mathbf{f}^2{}_p\ \mathbf{a^3}}$ or , $f^4{}_p = \frac{1}{4\pi^2 m a^3}$ 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

$f_{Ve\rightarrow e} = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}} = \sqrt[4]{\frac{1}{4\pi^2 3,919.10^{-36}(5.10^{-18})^3}} = \sqrt[4]{51,707428.10^{84}} = 2,6815643.10^{21}$ H

The Energy of the System is $\mathbf{E}_{Ve\rightarrow e} = h.f_{Ve\rightarrow e}$ = 6, 62606957.10^{-34}.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, $\mathbf{T} = \frac{2\pi.m_T}{Q_T.\bar{B}_F}$, $\bar{B}_F = \frac{2\pi.m_T}{Q_T.T} = \frac{|2\pi.m_T|}{Q_T} f$
so → $\bar{\mathbf{B}}_\mathbf{F} = \frac{|2\pi.m_T|}{Q_T}\ \mathbf{f}_{Ve\rightarrow e} = \frac{2\pi.[3,919.10^{-36}].2,6815643.10^{21}}{1,6022.10^{-19}}$ (Kg/Cs) = **0, 4121237.10** ^{6} Tesla.
From Energy-Relation W =2E= B w = J.w^2 , or **2E = 2π f B** then **Total -Spin*Frequency**
$\bar{\mathbf{B}}\ \mathbf{f} = \frac{\mathbf{E}}{\mathbf{g}}$, and E = $\bar{S}$.g.f = 5,691952. 10^{-34}{Kg/m/s}.g.[2, 6815643.10^{21} H]/1,6022.10^{-19}
9,3433859.10^6 eV = **9,3433859** MeV , **i.e. the Energy produced from total System-Spin** .
From Planck`s length $\mathbf{a} = \sqrt[3]{\frac{k}{f^2}}$ then $\mathbf{k} = a^3.f^2$, and since **Energy** E = k then Cave $\mathbf{a} = \sqrt[3]{\frac{E}{.f^2}}$

or Action-Range $\mathbf{a} = \sqrt[3]{\frac{E}{f^2}} = \sqrt[3]{\frac{9,3433859.10^{6}}{(2,6815643.10^{21})^2}} = \sqrt[3]{1,299355.10^{-36}} = 1,09121235.10^{-12}$ m

The **Weak Force** $\mathbf{W^-}$ in System is Coulomb`s Force → $[\mathbf{e^- \nu_e}] \equiv [\mathbf{-1\text{-}0\text{+}W^-}]$ which may be calculated from the Time needed , for Harmonic-mass to vibrate in cave **r** , from Energy equation $\mathbf{r} = \frac{m.v}{q.B} = \frac{[3,919.10^{-36}\ Kg].2,9978.10^{8}}{1,6022.10^{-19}.[0,4121237.10^{6}]} = \mathbf{17,792361.10^{-15}}$ m , and for Weak Force $\mathbf{W^-}$ in cave **d** $=\mathbf{10^{-15}}$ m then Period $\mathbf{T} = \frac{d}{c} = \frac{17,792361.10^{-15}\,m}{[2,998.10^{8} m/s\,]} = \mathbf{5,9351394.10^{-23}}$ **s** , and

The produced Energy in **d** , is → $\mathbf{E_{W^-}} = \underline{h} / T = \frac{1,055.10^{-34}\ J.s}{2.[\,5,9351394.10^{-23}s].[1,602.10^{-19}\ J/eV\,]} =$

$= 5,5472.\,10^{6}$ eV ≡ **5,55 MeV** , and because from Coulomb-Force $F_C = \frac{C.Q}{r^2}$ and $V_C = \frac{C.Q}{r}$ then issues → Weak-Force $\mathbf{W^-} = [\frac{E_{W^-}}{r}] = \frac{5,5472.10^{6}}{17,792361.10^{-15}} = \mathbf{3,1177424.10^{20}}$ eV , so the Weak-Force is $\mathbf{W^-} = [\frac{h / T}{2.r}] = [\frac{h.c / d}{2.r}] = \frac{h.c}{2.d.r} = \frac{\mathbf{h.c}}{\mathbf{2e.r^2}}$ eV ……..(w-f)

The above Interaction-System is figured as follows ,

$[\mathbf{e^-\nu_e}] \equiv \mathbf{\{-1\text{-}0\text{+}W^-}=[-1]+\langle W^-\rangle\} \equiv \mathbf{\Sigma}^{[\nu_e \to e^-]}_{D_A \to P_A}$, $(-1|W^-)$**Force** ≡CI $^{0 \to -1}_{G \to \gamma} \equiv \to$ n-p ← or $[e^-\nu_e] \equiv [-1\text{-}0\text{+}W^-] \equiv (-1|W^-) \equiv [\mu^+\nu_\mu] \equiv [\tau^+\nu_\tau]$ i.e. **Leptons** Combinations **Produce The Same Composites** $(-1|W^-) \equiv [d\bar{u}] \equiv [s\bar{c}] \equiv [b\bar{t}]$, in **Quark** Combinations , **i.e. The,** Interaction of Electron , $\mathbf{e^-}$, and Electron-neutrino , $\mathbf{\nu_e}$,gives Charges , -1 , - 0 , and an Coulomb-Force W , which according to Voltage (v) , is the **Constructive-Interference** (- 0) →(-1) = $\mathbf{W^-}$.**The Summation** of Charges shows the **Action** [⊕ is -0]→[⊖], of the Coulomb-Force W ≡ $\mathbf{W^-}$ as above because , ⊕ >> ⊖ , and the Direction of motion is from D_A to P_A Voltage-Point-Cave , with Energy-Voltage from , **G** to $\boldsymbol{\gamma}$, Forces .

For Combinations → $[e^-\bar{\nu_e}] \equiv [-1\text{+}0\text{+}Z^-] \equiv (-1|Z^-) \equiv [\mu^+\bar{\nu_\mu}] \equiv [\tau^+\bar{\nu_\tau}] \equiv [e^-\bar{\nu}_\mu] \equiv [e^-\bar{\nu}_\tau]$

For Combinations → $[e^-\mu^+] \equiv [-1\text{-}1\text{+}W^{--}] \equiv (-2|W^{--}) \equiv [e^-\tau^+] \equiv [\mu^+\tau^+]$

For Combinations → $[e^-e^+] \equiv [-1\text{+}1\text{+}Z^o] \equiv (0\,|Z^o) \equiv [\mu^+\mu^-] \equiv [\tau^+\tau^-] \to [e^+\bar{\nu_e}] \equiv (1|Z^+)$

For Combinations → $[\nu_e\bar{\nu}_e] \equiv [-0\text{+}0\text{+}Z^o] \equiv (0\,|Z^o) \equiv (0\,|Z^o) \equiv [\nu_\mu\bar{\nu}_\mu] \equiv [\nu_\tau\bar{\nu}_\tau]$

For , **Quarks → Quarks** , Combinations issues ,

For 2-Combinations → $[u\ d] \equiv [+\frac{2}{3}\,\text{-}\frac{1}{3}\,\text{+}Z^+] \equiv \left(+\frac{1}{3}\,\middle|Z^+\right) \equiv [u\ s] \equiv [u\ b] \to K^o \equiv [\bar{s}\ d] \equiv (0|Z^o)$

For 2-Combinations → $[u\ c] \equiv [+\frac{2}{3}\,\text{+}\frac{2}{3}\,\text{+}W^{++}] \equiv \left(+\frac{4}{3}\,\middle|W^{++}\right) \equiv [u\ t] \equiv [c\ t]$

For 2-Combinations → $[u\,\bar{u}] \equiv [+\frac{2}{3}\,\text{-}\frac{2}{3}\,\text{+}Z^o] \equiv (0\,|Z^o) \equiv [c\bar{c}] \equiv [t\bar{t}] \equiv [d\bar{d}] \equiv [s\bar{s}] \equiv [b\bar{b}]$

For 2-Combinations → $[u\,\bar{d}] \equiv [+\frac{2}{3}\,\text{+}\frac{1}{3}\,\text{+}W^+] \equiv \left(+\frac{3}{3}\,\middle|W^+\right) \equiv [c\bar{s}] \equiv [t\bar{b}]$

For 2-Combinations → $[d\,\bar{d}] \equiv [-\frac{1}{3}\,\text{+}\frac{1}{3}\,\text{+}Z^o] \equiv (0\,|Z^o) \equiv [s\bar{s}] \equiv [b\bar{b}] \equiv \to [e^-e^+]$

The Combinations→$[d\,\bar{u}] \equiv [-\frac{1}{3}\,\text{-}\frac{2}{3}\,\text{+}W^-] \equiv (-1|W^-) \equiv [c\,\bar{d}] \equiv [t\bar{s}] \equiv [e^-\nu_e] \equiv [\mu^+\nu_\mu] \equiv [\tau^+\nu_\tau]$

Are Common for all Particles **Leptons , Anti-leptons** and for **Quarks , Anti-Quarks** .

Since $[\mu^+\nu_\mu] \equiv \boldsymbol{\pi^+} \equiv (-1|W^+)$ then $\boldsymbol{\pi^-} = -\pi^+ = [\mu^-\bar{\nu_\mu}] \equiv (+1|W^+) \equiv (+1|Z^o)$ and $\boldsymbol{\pi^o} = [\mu^+\nu_\mu] + [\mu^-\bar{\nu_\mu}] = [\mu^+\mu^-] + [\nu_\mu\bar{\nu_\mu}] \equiv (0\,|Z^o) + (0\,|Z^o) \equiv \mathbf{2.Z^o = 2\gamma}$

For 3-Combinations → $[u\ d\ c] \equiv [+\frac{2}{3}\,\text{-}\frac{1}{3}\,\text{+}\frac{2}{3}\,\text{+}Z^+] \equiv \left(+\frac{3}{3}\,\middle|Z^+W^+\right) \equiv [c\ s\ t] \equiv [t\ b\ u] \equiv [t\ b\ c]$

For 3-Combinations → $[u\ u\ d] \equiv [+\frac{2}{3}\,\text{+}\frac{2}{3}\,\text{-}\frac{1}{3}\,\text{+}\ W^+] \equiv \left(+\frac{3}{3}\,\middle|W^+Z^+\right) \equiv [ccs] \equiv [t\ t\ b] \equiv [u\ c\ s]$

For 3-Combinations → $[d\ d\ u] \equiv [-\frac{1}{3}\,\text{-}\frac{1}{3}\,\text{+}\frac{2}{3}\,\text{+}\ W^-] \equiv (0\,|W^-Z^o) \equiv [ssc] \equiv [bbt] \equiv [dsc] \equiv [sbt]$

EXAMPLES :

PROTON is→ **[u u d]** $\equiv [+\frac{2}{3}\,\text{+}\frac{2}{3}\,\text{-}\frac{1}{3}\,\text{+}W^+] \equiv \left(+\frac{3}{3}\,\middle|W^+Z^+\right) =$ Two **u**-Quarks and One **d**-Quark .

Interaction of Up-Quark **u** , and Up-Quark **u** , is → $\mathbf{u\ u} \equiv [+\frac{2}{3}\,\text{+}\frac{2}{3}\,\text{+}\mathbf{W^+}] \equiv \mathbf{\Sigma}^{[u\ u]}_{D_A > D_A}$ 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 $[\oplus \to \ominus = +] \equiv DI^{+,-}_{0\,+} \equiv Z^+$

Since ,u u, Summation occupies Constructive-Interference , $\mathbf{W^+}$, therefore is Stable .

The Process from measurements ,

1… DATA .

Up-Quark mass $\mathbf{m_u} = 8,91.10^{-30}$ Kg , Charge $\mathbf{q_u} = [+\frac{2}{3}].1,602.10^{-19}$ C , Diameter **a** =

$5{,}0.10^{-17}$ m , The Down-Quark $\mathbf{m_d} = 10{,}7.10^{-30}$Kg ,Charge $\mathbf{q_d} = [-\frac{1}{3}].1{,}602.10^{-19}$ C, mean-Diameter $\mathbf{a} = 5{,}0.10^{-18}$ m , or ↻

From $\mathbf{m_u} = 5{,}0.10^{6}$ eV/c² = $(17{,}826614.\ 10^{-37}).5.10^{6}$Kg then = $8{,}913307.10^{-30}$ Kg

$\mathbf{m_d} = 6{,}0.10^{6}$ eV/c² = $(17{,}826614.\ 10^{-37})\ .6.10^{6}$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 → $[y_1+y_2 \rightarrow\ y_3]$

The System Total-Harmonic-**Mass** $\equiv M_T$ is → $\frac{1}{M_T} = \frac{2}{m_u} + \frac{1}{m_d} = \frac{2.10^{30}}{8{,}9133} + \frac{10^{30}}{10{,}696} =$

$= \frac{30{,}305243.10^{30}}{95{,}336656} = \frac{10^{30}}{3{,}1458799}$ 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 , $4\ \pi^2\ m\ f^2{}_o = k$, and constant law of Areas $1 = k\ .\mathbf{f}^2{}_o\ \mathbf{a^3}$. Their common k , is the Constant-Energy → $k = 4\ \pi^2\ m\ f^2{}_p = \frac{1}{\mathbf{f}^2{}_p\ \mathbf{a^3}}$ or , $f^4{}_p = \frac{1}{4\pi^2 m a^3}$ 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

$f_{2u\rightarrow d} = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}} = \sqrt[4]{\frac{1}{4\pi^2 3{,}1458799.10^{-30}(5.10^{-19})^3}} = \sqrt[4]{805{,}18982.10^{80}} = 5{,}3269.10^{20}$ H

The System`s Energy is $\mathbf{E}_{2u\rightarrow d} = h.f_{2u\rightarrow d} = 6{,}62606957.10^{-34}\ .\ 5{,}3269.10^{20} =$

$35{,}29641.10^{-14}$ Joules / $1{,}6022.10^{-19}$ C = $22{,}029965.10^{5}$ eV = **2 , 2029965 MeV** ….(3)

The Magnetic-fields laws for Charges and Periods are, $\mathbf{T} = \frac{2\pi.m_T}{q.\bar{B}_F}$, $\bar{B}_F = \frac{2\pi.m_T}{q\ .T} = \frac{|2\pi.m_T|}{Q_T}$ f

so → $\bar{B}_F = \frac{|2\pi.m_T|}{Q_T}\ \mathbf{f}_{2u\rightarrow d} = \frac{2\pi.[3{,}1458799\ .10^{-30}]5{,}3269.10^{20}}{1{,}6022.10^{-19}}$ (Kg/Cs) = **65,7 .10⁹** Tesla. ….(4)

From Energy-Relation $W = 2E = B\ w = J.w^2$, or **2E = 2π f B** then **Total -Spin*Frequency**

$\bar{\mathbf{B}}\ \mathbf{f} = \frac{\mathbf{E}}{\mathbf{g}}$, and $E = \bar{S}.g.f = 5{,}691952.10^{-34}\{Kg/m/s\}.g.[\ 5{,}3269.10^{20}$ H]/$1{,}6022.10^{-19}$ =

$1{,}8562244.10^{6}$ eV = **1 , 85622** MeV , **i.e. the Energy produced from total System-Spin** .

From Planck`s length $\mathbf{a} = \sqrt[3]{\frac{k}{f^2}}$ then $\mathbf{k} = a^3.f^2$, and since **Energy** E = k then Cave $\mathbf{a} = \sqrt[3]{\frac{E}{f^2}}$

or **Action-Range** $a = \sqrt[3]{\frac{E}{f^2}} = \sqrt[3]{\frac{[22{,}029965.10^{5}\ ]}{(5{,}3269.10^{20})^2}} = \sqrt[3]{7{,}763628.10^{-36}} = 1{,}98010509.10^{-12}$ m.

The **Weak Forces , $\mathbf{W^+Z^+}$,** in System is the Coulomb`s Force → [u+u] > [d] ≡$[\frac{4}{3}-\frac{1}{3}+W^+Z^+]$ which may be calculated from the Time needed , for Harmonic-mass to vibrate in cave **r** , from Energy equation $\mathbf{r} = \frac{m.v}{q.B} = \frac{[3{,}1458799.10^{-30}\ Kg].2{,}9978.10^{8}}{1{,}6022.10^{-19}.[65{,}7\ .10^{9}]} =$ **8, 959064.10⁻¹⁴** m ….(5)

and for Weak Forces **, $\mathbf{W^+Z^+}$,** in cave $\mathbf{d = 10^{-14}}$ m then Period $\mathbf{T} = \frac{d}{c} = \frac{8{,}959064.10^{-14} m}{[2{,}998.10^{8} m/s\ ]} =$

$=$ **2,9883468 . 10^{-22} s** , and The produced Energy in **d** , is → $\mathbf{E}_{W^+Z^+} = \underline{h} / T =$

$= \frac{1{,}055.10^{-34}\ J.s}{2.[\ 2{,}9883468.10^{-22}s].[1{,}602.10^{-19}\ J/eV\ ]} = 1,\ 10173.10^{6}$ eV≡ **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** $[F_C]$ x **Cave** [r] = **Voltage** $[V_C]$ → so

Weak-Forces $\mathbf{W^+Z^+} = [\frac{E_{W^+Z^+}}{r}] = \frac{1{,}1017.10^{6}}{8{,}959064.10^{-14}} =$ **1,229736.10 ¹⁹**eV...(7) or from Weak-Forces

$\mathbf{W^+Z^+} \equiv [\frac{h/T}{2.r}] \equiv [\frac{h.c/d}{2.r}] \equiv \frac{h.c}{2.d.r} \equiv [\frac{\mathbf{h.c}}{\mathbf{2e.r^2}}]$ eV = $\frac{1{,}055.10^{-34}\ J.[2{,}998.10^{8} m/s\ ]}{2.\left[1{,}602.\frac{10^{-19} J}{eV}.[8{,}95906.10^{-14}]^2\right]} =$ **1,2297.10 ¹⁰** 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 .

NEUTRON is→ [d d u] ≡ $[-\frac{1}{3}-\frac{1}{3}+\frac{2}{3}+W^-] \equiv (0\ |\mathbf{W^-Z^o})$ = Two **d**-Quarks and One **u**-Quark.

Interaction of Down-Quark **d** , and Down-Quark **d** , is → **d d** ≡ $[-\frac{1}{3}-\frac{1}{3}+\mathbf{W^-}] \equiv \mathbf{\Sigma}\ ^{[d+d]}_{P_A>P_A}$ and the Summation of Down-Quarks [d + d] of Cave P_A , **Is attacked** << 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 [$\oplus \rightarrow \ominus = 0$] ≡ [$+\frac{2}{3}-\frac{2}{3}+\mathbf{Z^o}$] or ,CI $\bar{}\,\vec{}\,\bar{}$ ≡ [W^-] + DI $^+\,\vec{}\,\bar{}$ ≡ $\mathbf{Z^o}$ and [d d u] ≡(0 |$\mathbf{W^-Z^o}$)

The Process from measurements ,

1… DATA .

The Down-Quark-mass $\mathbf{m_d}$ = 10,7.10^{-30}Kg , Charge $\mathbf{q_d}$ = [$-\frac{1}{3}$].1,602.10^{-19} C,

mean-Diameter **a** = 5,0.10^{-18} m . Up-Quark mass $\mathbf{m_u}$ = 8,91.10^{-30} Kg ,

Charge $\mathbf{q_u}$ = [$+\frac{2}{3}$].1,602.10^{-19} C , Diameter **a** = 5,0.10^{-17} m , or ↻

From $\mathbf{m_d}$ = 6,0.10^6 eV/c² → (17,826614. 10^{-37}) .6.10^6Kg = 10,695968.10^{-30} Kg

$\mathbf{m_u}$ = 5,0. 10^6 eV/c² → (17,826614. 10^{-37}). 5.10^6Kg = 8,913307.10^{-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+δ) }

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 → [y_1+y_2→ y_3]

The System Total-Harmonic-**Mass** ≡ M_T 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} Kg . …….(1)

The System Total- Harmonic-Charge ≡ $Q_T \equiv 2.q_d + q_u$ = 2.(-1/3).e + (2/3) e = 0 e ,

and the **System-Resonance-Charge** Q_T = 0 C ….(2)

Frequency Unit-Cave is the Stationary-System becoming from Kepler second Planetary-law equation , 4 π² m $f^2{}_o$ = k , and constant law of Areas 1 = k .$\mathbf{f^2{}_o\ a^3}$. Their common k , is the Constant-Energy → k = 4 π² m $f^2{}_p = \frac{1}{\mathbf{f^2{}_p\ a^3}}$ or , $f^4{}_p = \frac{1}{4\pi^2 m a^3}$ 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 $\mathbf{E}_{2d\rightarrow u}$ = 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.($\bar{v}$ x $\bar{B}$) shows that + q charges turn Right while –q charges turn Left .

The Magnetic-fields laws for Charges and Periods are, $\mathbf{T} = \frac{2\pi.m_T}{q.\bar{B}_F}$, $\bar{B}_F = \frac{2\pi.m_T}{q.T} = \frac{|2\pi.m_T|}{Q_T}$ f

so → $\bar{B}_F = \frac{|\mathbf{2\pi.m_T}|}{\mathbf{Q_T}}\ \mathbf{f_{2d\rightarrow u}} = \frac{2\pi.[3,34255.10^{-30}]4,962072.10^{20}}{1,6022.10^{-19}}$ (Kg/Cs) = **409 .10 ^{9}** Tesla. ….(4)

From Energy-Relation W =2E= B w = J.w² , or **2E = 2π f B** then **Total -Spin*Frequency** $\mathbf{\bar{B}\ f = \frac{E}{g}}$, and E = $\bar{S}$.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 , $\mathbf{W^-Z^o}$,** in System is the Coulomb`s Force → [d+d] > [d] ≡[$-\frac{2}{3}+\frac{1}{3}+W^-Z^o$] which may be calculated from the Time needed , for Harmonic-mass to vibrate in cave **r** , from Energy equation $\mathbf{r} = \frac{m.v}{q.B} = \frac{[3,3425529.10^{-30}\ Kg].2,9978.10^8}{1,6022.10^{-19}.[409.10^9]}$ = **1, 52911.10^{-14}** m ….(5)

and for Weak Forces **, $\mathbf{W^-Z^o}$,** in cave **d =10^{-14}** m then Period $\mathbf{T} = \frac{d}{c} = \frac{1,52911.10^{-14}m}{[2,998.10^8 m/s]}$ =

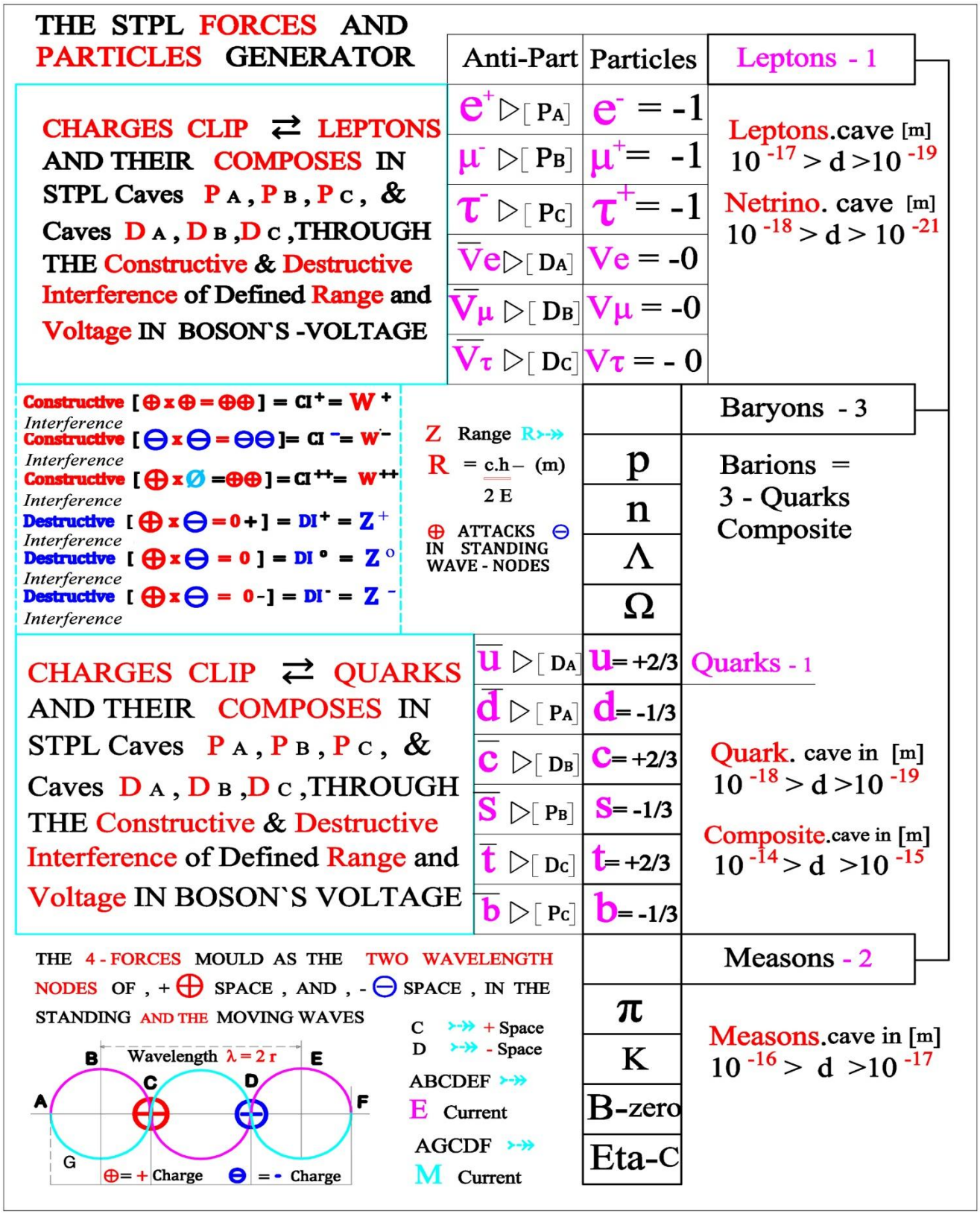
= **5,100773 .10^{-23} s** , and The produced Energy in **d** , is → $\mathbf{E_{W-Z^o}}$ = h / T =

$\frac{1,055.10^{-34}\ J.s}{2.[5,100773.10^{-23}s].[1,602.10^{-19}J/eV]}$ = 6,4554113.10^6 eV≡ **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] x **Cave** [r] = **Voltage** [V_C] → so Weak-Forces $\mathbf{W^-Z^o}$= $[\frac{E_{W-Z^o}}{r}]=\frac{6,4554.10^6}{1,52911.10^{-14}}$ = **4,22141.10 ^{20}** eV ....(7) or from Weak-Forces

$\mathbf{W^-Z^o}$ ≡$[\frac{h/T}{2.r}]\equiv[\frac{h.c/d}{2.r}]\equiv\frac{h.c}{2.d.r}\equiv[\frac{\mathbf{h.c}}{\mathbf{2e.r^2}}]$ eV = $\frac{1,055.10^{-34}\ J.[2,998.10^8 m/s]}{2.\left[1,602.\frac{10^{-19}J}{eV}.[1,52911.10^{-14}]^2\right]}$ = **4,22141.10 ^{20}** eV

Since [d d u] Summation occupy the **Zero-Constructive-Interference** therefore is Stable

and Forces (W^-, Z^o) are equal and opposite as , $\rightarrow [\ W^- + Z^o = 0\ ] \equiv [\ominus \leftarrow \oplus \rightarrow \ominus] \leftarrow$
Reams $\boldsymbol{\pi^+ \equiv}\ (+1|\mathbf{W}^+)$, $\boldsymbol{\pi^- \equiv}\ (-1|\mathbf{W}^-)$, $\boldsymbol{\pi^o \equiv 2.Z^o \equiv 2\gamma}$, and $\mathbf{p} \equiv\ (+1|\mathbf{W}^+\mathbf{Z}^+)$
For 3-Combinations $\rightarrow$ [u u u] $\equiv [+\frac{2}{3}+\frac{2}{3}+\frac{2}{3}+W^+]=[\frac{4}{3}+W^+ +\frac{2}{3}+\ W^+] \equiv (+2|\mathbf{W}^{++}) \equiv\ \boldsymbol{\Delta^{++}}$ and
$\{\boldsymbol{\pi^-}\}+\{\mathbf{p}\} \equiv\ (+1|\mathbf{W}^+)+(+1|\mathbf{W}^+\mathbf{Z}^+)\ =\ (+2|\mathbf{W}^{++}\mathbf{Z}^+)=(+2|\mathbf{W}^{++}[Z^+])=\ (|\boldsymbol{\Delta^{++}}|Z^+|)$
i.e. $\boldsymbol{\Delta^{++}}$Particle Decays to $\{\boldsymbol{\pi^-}+\mathbf{p}\}$ **through** The-Destructive-Interference-Force$\rightarrow [Z^+]$**.**
For 3-Combinations $\rightarrow$[d d d] $\equiv [-\frac{1}{3}-\frac{1}{3}-\frac{1}{3}+W^-] \equiv (-\mathbf{1}\ |\boldsymbol{W^{--}Z^o}) \equiv (-1|\mathbf{W}^-)+(0|\mathbf{W}^-\mathbf{Z}^o) \equiv \boldsymbol{\Delta^-}$
For 3-Combinations $\rightarrow$ [$e^- e^- e^-$] $\equiv$ [-1-1-1+Z^o] $\equiv\ (-2\ |\mathbf{W}^{--} - \mathbf{1}) \equiv\ (-3\ |\mathbf{W}^{--}\ W^-)$
For 3-Combinations $\rightarrow$ [$\nu_e \nu_e \nu_e$] $\equiv$ [-0-0-0+Z^o] $\equiv\ (\ 0\ |\boldsymbol{Z^o} - \mathbf{0}) \equiv\ (\ 0\ |\boldsymbol{Z^o}\ \mathbf{Z^o})$
For 3-Combinations $\rightarrow$[s s s] $\equiv [-\frac{1}{3}-\frac{1}{3}-\frac{1}{3}+Z^-] \equiv (-\mathbf{1}\ |\mathbf{W}^{--}\mathbf{Z}^o) \equiv (-1|\mathbf{W}^-)+(0|\mathbf{W}^-\mathbf{Z}^o) = \boldsymbol{\Omega^-}$
For 3-Combinations $\rightarrow$[d s s] $\equiv [-\frac{1}{3}-\frac{1}{3}-\frac{1}{3}+W^-] \equiv (-\mathbf{1}\ |\mathbf{W}^{--}) \equiv (-1|\mathbf{W}^{--}\mathbf{Z}^o)\ \equiv \boldsymbol{\Xi^-} \equiv\ \boldsymbol{\Omega^-}$
Using above Reams , then All Elementary and Composite Particles are defined .
Charged- Pions $\rightarrow \boldsymbol{\pi^+} \equiv (-1|\mathbf{W}^-) \equiv (-1|\mathbf{Z}^-)$, $\boldsymbol{\pi^- \equiv} (+1|\mathbf{W}^+) \equiv (1|\mathbf{Z}^o)$, $\boldsymbol{\pi^o \equiv 2.Z^o \equiv 2\gamma}$,
Proton $\rightarrow \mathbf{p}\ \equiv$ [u u d] $\equiv (+1|\mathbf{W}^+\mathbf{Z}^+)$, ***Stability is*** $> [\oplus \rightarrow \ominus \leftarrow \oplus]$
Neutron $\rightarrow \mathbf{n}\ \equiv$ [d d u] $\equiv (\ 0\ |\mathbf{W}^-\mathbf{Z}^o)$, ***Stability is*** $> [\ \ominus \leftarrow \oplus \rightarrow \ominus\ ]$
Delta $\rightarrow \boldsymbol{\Delta^{++}} \equiv\ (+2|\mathbf{W}^{++}\mathbf{Z}^+) \equiv\ (+1|\mathbf{W}^+)+(+1|\mathbf{W}^+\mathbf{Z}^+) \equiv\ \boldsymbol{\pi^-}+\mathbf{p}$
Delta $\rightarrow \boldsymbol{\Delta^+} \equiv$ [u u d] , $\boldsymbol{\Delta^o} \equiv$ [u d d] ,
Delta $\rightarrow \boldsymbol{\Delta^{--}} \equiv\ (-\mathbf{1}|\mathbf{W}^{--}\mathbf{Z}^\mathbf{0}) \equiv\ (-1|\mathbf{W}^-)+(0|\mathbf{W}^-\mathbf{Z}^o) \equiv\ \boldsymbol{\pi^+}+\mathbf{n}+\ \mathbf{Z}^o$
Omega $\rightarrow \boldsymbol{\Omega^-} \equiv\ (-\mathbf{1}|\mathbf{W}^{--}\mathbf{Z}^\mathbf{0})$, Xi $\equiv (-\mathbf{1}\ |\mathbf{W}^{--}) \equiv (-1|\mathbf{W}^-\mathbf{Z}^o)$
For 2-Combinations Pion $\pi^+ \rightarrow$ [u $\bar{d}$] $\equiv [\ \frac{2}{3}+\frac{1}{3}+W^+] \equiv (+\mathbf{1}\ |\mathbf{W}^+)$ **,** *is Stable* **.**
For 2-Combinations Pion $\pi^- \rightarrow$ [d $\bar{u}$] $\equiv [-\frac{1}{3}-\frac{2}{3}+W^-] \equiv (-\mathbf{1}\ |\mathbf{W}^-) = [\ \mu^+\nu_\mu\ ]$,
For 2-Combinations Pion $\pi^o \equiv \pi^+ - \pi^- \equiv (+\mathbf{1}\ |\mathbf{W}^+) - (-\mathbf{1}\ |\mathbf{W}^-) \equiv (\mathbf{0}\ |\mathbf{W}^+\mathbf{W}^-) \equiv (\mathbf{0}\ |\mathbf{Z}^+\mathbf{Z}^-)$
For 2-Combinations Kaon $K^+ \rightarrow$ [u $\bar{s}$] $\equiv [\ \frac{2}{3}+\frac{1}{3}+W^+] \equiv (+\mathbf{1}\ |\mathbf{W}^+)$
For 2-Combinations Kaon $K^- \rightarrow$ [s $\bar{u}$] $\equiv [-\frac{1}{3}-\frac{2}{3}+W^-] \equiv (-\mathbf{1}\ |\mathbf{W}^-)$
For 2-Combinations Kaon $K^o \rightarrow$ [d $\bar{s}$] $\equiv [-\frac{1}{3}+\frac{1}{3}+Z^o] \equiv (\ \mathbf{0}\ |\ \mathbf{Z}^o)$
For 2-Composite Protons p $\rightarrow$ [p + p] $\equiv (\mathbf{1}\ |\mathbf{W}^+\mathbf{Z}^+)+(\mathbf{1}\ |\mathbf{W}^+\mathbf{Z}^+) \equiv [e^+ \bar{\nu}_e\ z^+ + u\ \bar{d}\ z^+]$
$\equiv [\ e^+ \bar{\nu}_e\ e^+\ \nu_e + u\ \bar{d}\ u\ d\ ] \equiv\ \mathbf{2.}\ \mathbf{e^+ + 2.}\ \boldsymbol{\bar{u}}$
For 2-Composite Neutrons n$\rightarrow$ [**n + n**] $\equiv (\ 0\ |\mathbf{W}^-\mathbf{Z}^o)\ +\ (\ 0\ |\mathbf{W}^-\mathbf{Z}^o) \equiv (\ 0\ |\mathbf{W}^{--}\mathbf{Z}^o)$
For 2-Composite Protons + Neutron $\rightarrow$ [**n + p**] $\equiv (\mathbf{0}\ |\mathbf{W}^-\mathbf{Z}^o) + (\mathbf{1}\ |\mathbf{W}^+\mathbf{Z}^+) \equiv$
$\equiv [e^+\ e^-,\ e^+\nu_e\ ] \equiv\ e^+\nu_e \equiv\ u\ \bar{u}\ e^+ \equiv \mathbf{e^+Z^o}$
For 2-Composite Protons - Neutron $\rightarrow$ [**n - p**] $\equiv (\mathbf{0}\ |\mathbf{W}^-\mathbf{Z}^o) - (\mathbf{1}\ |\mathbf{W}^+\mathbf{Z}^+) \equiv$
$\equiv$ [u u d - d d u = u u + d $\bar{d}$ + d $\bar{u}$] $\equiv Z^o + Z^o + (-\mathbf{1}\ |\mathbf{W}^-) \equiv \bar{\nu_e} + e^- \equiv \mathbf{W}^-$
For 1-Composite Anti-Protons $\bar{\mathbf{p}} \rightarrow \bar{p} \equiv$ -p = -[d d d] $\equiv [\bar{d}\ \bar{d}\ \bar{d}] \equiv [\frac{1}{3}+\frac{1}{3}+\ W^+ \frac{2}{3}W^+\ ] \equiv$
$\left(1\ \middle|W^+ + \frac{1}{3}|W^+\right) = [e^+\nu_e\ + u\ d\ Z^+ \equiv (1\ |Z^+)+(0\ |Z^+)+ u + d \equiv (\mathbf{1}\ |\mathbf{Z}^{++}) + \mathbf{u + d}$ **,** *is Stable*
Delta $\rightarrow \boldsymbol{\Delta^+} \equiv$ [u u d] $\equiv [\ \frac{2}{3}+\frac{2}{3}-\frac{1}{3}+W^+ Z^+\ ] \equiv (1\ |W^+Z^+) = (1\ |W^+)\ -\ (0\ |Z^+)$
$\equiv\ p - Z^+ + (\ 0\ |\ Z^+) \equiv p + (\ 0\ |\ Z^+ Z^-) \equiv p + (\ 0\ |\ Z^o) \equiv \mathbf{p} + \boldsymbol{\pi^o}\ -\ Z^o$
Delta $\rightarrow \boldsymbol{\Delta^{--}} \equiv$ [d d d] $\equiv [-\frac{1}{3}-\frac{1}{3}-\frac{1}{3}+W^-\ W^-\ ] \equiv (-1|W^-) + (0|W^-)\ \equiv \boldsymbol{\pi^-} + \mathbf{n}\ -\ Z^o$
Delta $\rightarrow \boldsymbol{\Delta^o} \equiv$ [u d d] $\equiv [\ \frac{2}{3}-\frac{1}{3}-\frac{1}{3}+Z^+\ Z^o\ ] \equiv (0\ |Z^+Z^o) = (0\ |Z^+)\ +\ (0\ |Z^o) \equiv$
$\equiv\ n - (0\ |W^-)\ +\ (0\ |Z^+) = n + (0\ |W^+)\ +\ (0\ |Z^+) =$
$\equiv\ n + (0\ |Z^+) - (0\ |W^-) \equiv \mathbf{n} + \boldsymbol{\pi^o}\ -(\mathbf{0}\ |\mathbf{W}^-)$ *decays to* $\rightarrow \mathbf{n} + \boldsymbol{\pi^o}$
Alfa-Decay $\rightarrow \boldsymbol{\alpha^+} \equiv [p\ p + n\ n] \equiv [p\ n + p\ n] \equiv\ e^+\nu_e\ +\ e^+\nu_e \equiv (+\mathbf{2}\ |\boldsymbol{\nu_e}) \equiv\ \boldsymbol{^4_2}\mathbf{He}$
Muon-Decay $\rightarrow\ \boldsymbol{\mu^-} \rightarrow [\mu^- - e^-] = [+1-1+Z^o] = \nu_\mu + \bar{\nu_e} = \bar{\nu_e}$ or $\rightarrow\ \boldsymbol{\mu^-} \equiv \mathbf{e^-} + \boldsymbol{\nu_\mu} + \boldsymbol{\bar{\nu}_e}$
Beta-Decay $\rightarrow\ \boldsymbol{\beta^+} \rightarrow [\mathbf{n - p}] \equiv [e^- + \bar{\nu_e}] - [e^- + \bar{\nu_e}] \equiv Z^- + (1\ |Z^o) \equiv (-1\ |Z^oZ^-) \equiv\ \mathbf{e}^-$*or*
Beta-Decay $\rightarrow\ \boldsymbol{\beta^+} \rightarrow \mathbf{n} \equiv \mathbf{p} +\ \mathbf{e^+}$ or $\rightarrow\ \mathbf{e^-} + \mathbf{n} \rightarrow \mathbf{p}$
Gamma-Radiation $\rightarrow\ ^0_0\gamma \equiv 2\pi.E_N \equiv$ Energy of Electron-Nutation in Unit-circle $\equiv 2\pi.[h.f_N] \equiv$
$\equiv 2\pi.1.\ 6.6261.10^{-34}.\ 2{,}8398.10^{10}/1{,}6022.10^{-19} \equiv 7{,}379.10^{\,6}$ eV $\equiv$ **7,38 .MeV**
Nucleus-Emits $\mathbf{e^+ + 2\ \nu_e} \equiv 1 + 0|Z^o + 0|Z^o \equiv 1|Z^o + 0|Z^o \equiv -\mathbf{e^-} + (\bar{\nu_\mu}\ \nu_\mu) \equiv -\mathbf{e^-}$ ***is absorbed***
Nucleus-Emits(+) $\mathbf{2\ \nu_e} \equiv 0|Z^o + 0|Z^o \equiv -e^- + 0|Z^o \equiv -e^- + 2\ \nu_e - e^- \equiv -2.e^- + 2\ \nu_e$ *and*
Nucleus-Emits(+) $\mathbf{2\ \nu_e}$ and Absorbs (-) 2-electrons i.e. issues , 1-Emit $\leftrightarrow$1-Absorb .
Atoms-Decay $\rightarrow$ From the Atom`s Construction (Page 63) are seen the Positions for Equilibrium , ***Onion - Structure***, therefore Decay exists on Neutrons , n= [d d u] and for each Decay >> **α-D** $\rightarrow\ (+\mathbf{2}\ |\boldsymbol{\nu_e}) \equiv\ ^4_2$He , **β-D** $\rightarrow$ n = p + e^+ , **γ-D** $\rightarrow\ ^0_0\gamma$



For Uranium issues $^{238}_{92}U \equiv {}^{4}_{2}He + {}^{234}_{90}U + 2.\,{}^{0}_{0}\gamma$,where 92 is Atomic-Number
Mass-Number 238 = 92+92 + 54 Neutrons . A further analysis in [91] .

Figure - 28 - : The [STPL] line Voltage-Machine Producing the **Forces** as **Material-Points** Joining the Elementary-Particles in an Higher to a Lower Voltage :
1.. The Constructive and Destructive Interference between Wave-Particles-System Regulates

the Voltage , *the free energy motion* ≡ *binding Energy* , in Nucleus or other Caves .

2.. When the Binding Energy of any Two Particles ≡ The-motion of , $\oplus$ to $\ominus$, is as ,

$\oplus \rightarrow \ominus >> 0$ ≡ **Stable-System** → XB A← -----C-----**0**+++X++→ B

$\oplus \rightarrow \ominus << 0$ ≡ Un-Stable-System ← CA

$\oplus \rightarrow \ominus \approx 0$ ≡ Radioactive-System ← **0**X=**0**C→$(+1|W^+Z^+)$ $(0\ |W^-Z^o)$

For Deuterium $\mathbf{{}^2_1H \equiv p + n} \equiv (+1|W^+Z^+)+(0\ |W^-Z^o) \equiv p + (0\ |W^-Z^o) \equiv$

$p +(0|W^-)+(0\ |Z^o) \equiv p+[\ \nu_e\ \nu_e\ ]+[\nu_e + \bar{\nu}_e\ ] \equiv$ **p + 3.** $\boldsymbol{\nu_e + \bar{\nu}_e} \equiv$ …….(D)

Initial $\mathbf{D = {}^2_1H \equiv p + n} \equiv (1\ |W^+Z^+) + (0\ |W^-Z^o) = \mathbf{(1\ |Z^+Z^o)} = (1|Z^+) + (0|Z^o)$

$= [e^-\bar{\nu}_e\ ] + [e^-e^+] = 2e^+ + e^- + [\bar{\nu}_e\ ] = 2e^+ + [e^- + \bar{\nu}_e\ ] = 2e^+ + (-1|Z^-)$ …….(D)

From relation ${}^2_1H \equiv (1\ |Z^+Z^o) >> 0$ is seen that Deuterium is an Stable-System although its bound is Weak . The Relation $\mathbf{p} \equiv (1\ |W^+Z^+)$ 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

$\mathbf{V_{p+n}} = \frac{[9.10^9.].[1,6022.10^{-19}]^2}{1,0.10^{-15}.[1,6022.10^{-19}]} = 14,42.10^5$ eV = 1,442 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 $\mathbf{p \equiv [u\ u\ d\ ] \equiv\ (+1\ |W^+Z^+)}$,

while the Neutron`s $\mathbf{n \equiv [d\ d\ u\ ] \equiv\ (0\ |W^-Z^o)}$

The Stability of the Composite Particles in Energy-Voltage :

From Coulomb-Energy equations issues , **Force** $[F_C]$ x **Cave** [r] = **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*,

$G \equiv \Phi^2.\ [\{\sigma\ \Phi\}] \equiv 2\pi f_P\ r \equiv \frac{2B}{\pi r^3} \equiv w\ r \equiv \bar{v} \equiv ma \equiv m\ g \equiv \bar{c}\ ]$ can be expressed in all Spectrum.

Voltage $V_C \equiv \int_{\infty}^{r} \frac{q_1 q_2}{4\pi\varepsilon.r^2} = \frac{q_1 q_2}{4\pi\varepsilon.r}$ while Force $F = \frac{q_1 q_2}{4\pi\varepsilon.r^2}$ and $V_C \equiv r\ F_C$ ….(q) i.e.

In any cave , r , exists a Voltage V_C , and in which a Force F_C .

From Mechanics **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 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 → $\mathbf{m\ v = \frac{h}{2r}}$, $\mathbf{v = \frac{h}{2.m.r} = \frac{h}{m.\lambda}}$ …..(1) and Voltage $V_C = \frac{mv^2}{2.q}$ …..(2) . Placing (1) to (2) then becomes ,

$V_C = \frac{mv^2}{2.q} = \frac{m.h^2}{2m^2.\lambda^2.q} = \frac{m.h^2}{2q.m^2.\lambda^2} = \mathbf{\frac{h^2}{2.q.m.\lambda^2}}$, or Voltage $\mathbf{V_C = \frac{h^2}{2.q.m.\lambda^2} = \frac{v.h^2}{4q.S.r^2}}$, related to the inverse squared cave and Spin , or from Charge and mass .

Example 1 : For q = e = $(1{,}602.10^{-19}C)$, $m_p = 3{,}3425529\ .10^{-30}$ Kg , and wavelength

$\lambda = 2r = 6.10^{-12}$ m , then Velocity of Proton $v_p = \frac{h}{m.\lambda} = \frac{6{,}626.10^{-34}\ J.s}{3{,}3425529.10^{-30}.[6.10^{-12}]} =$

$0{,}3303861.10^8 = 3{,}303861.10^7$ m/s , a velocity near light velocity .

Voltage of Cave is equal to the Kinetic Energy of Proton , $\mathbf{V_p = \frac{3{,}3425529\ .10^{-30}.[3{,}964634.10^7]^2}{2.[1.6022.10^{-19}]}} =$

1,1386102 Volt , or from $\mathbf{V_p = \frac{h^2}{2.q.m.\lambda^2}} = \frac{[6{,}626.10^{-34}]^2}{2[1.6022.10^{-19}]3{,}3425529.10^{-30}[6.10^{-12}]^2} =$ **1,1386 Volt** .

Example 2 :

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 Voltage , ***it is an Unstable-cave*** , in Cave and when it is equal becomes ,

an ***Radioactive cave*** . If This Potential of caves is measured with light-velocity **c** , as equation

$c = \mathbf{\frac{h}{m.\lambda}}$, and $m = \mathbf{\frac{h}{c.\lambda}}$ so → $E = \frac{mc^2}{2} = q\,V_C = \mathbf{\frac{h}{c.\lambda}}[\frac{c^2}{2}]$, or $V_C = \mathbf{\frac{h}{2.q.\lambda}}[\frac{c}{1}] = \mathbf{\frac{h.c}{2.q.\lambda}}$, and then

Voltage is $\mathbf{V_C} = \frac{6{,}626.10^{-34}.[2{,}998.10^8]}{2.[1.6022.10^{-19}]6.10^{-12}} =$ **1,0332016.10^5** Volts , i.e. **increases 10^5** times .

With this way starting energy 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 k-eV 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 and Nutation-Force in a Cave ≡ Magnetic-field , then becomes

→ **Charge** $\mathbf{Q_+ = \bar{q}\,f} = [\frac{g.S}{2\pi r^2}]$ ← which originates the [$\oplus$] Forces as ,

a).. Lorentz-Force → $\mathbf{F}_L = \bar{q}\ \bar{v}x\bar{B}_F = 2\pi.\bar{q}\bar{v}.[\frac{f=1}{g}]$ ← where Magnetic-Field $\bar{B}_F = [\frac{2\pi.m}{Q_+}].f$

b).. Nutation-Force → $\mathbf{F}_N = [\frac{\bar{v}.S}{r^2}]$ ← where Spin **S ,** is in , **r** cave . Equating

$\mathbf{F}_L = \bar{q}\bar{v}x\bar{B}_F = 2\pi.\bar{q}\bar{v}.[\frac{f=1}{g}] = \mathbf{F}_N = [\frac{\bar{v}.S}{r^2}]$, from where → Charge $Q_+ = \bar{q}\,f = [\frac{g.S}{2\pi r^2}] = \frac{g.S}{r.f}$

It was shown [82] that Monads ≡ Quaternions consist of the Real and Imaginary-Part as

$z^{1/w} = [s + \bar{v}\,\nabla i]^{1/w} = |z_o|^{-w}\cos(\varphi + 2k\pi)/w + i.\sin(\varphi + 2k\pi/w)] \equiv |z_o|^{-w}.e^{-i.(\varphi+2k\pi).wt} \equiv$

$|z_o|^{-w}.\cos(\varphi+2k\pi) + \mathbf{i}\,.\ |z_o|^{-w}.\sin(\varphi+2k\pi) \equiv \mathbf{x + i\,.\,y}$ ……...(a)

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

Above equations define the Wave-nature of monads in all Levels and Sub-levels .

From above monads $(s + \bar{v}\,\nabla i)^{1/w} = |z_o|^{-w}.e^{-i.(\varphi+2k\pi).w}$, where $\cos\varphi = s/|z_o|$

and for ***the Rotated Energy case*** , where $s = 0$ and $\cos\varphi = 0$, exists for angle $\varphi = \pi/2$

quaternion $(s + \bar{v}\,\nabla i)^{1/w}$ ***as dimension Power*** → **w = b** ← ***and for*** **k = 1** becomes ,

$e^{-i.(\pi/2+2k\pi).w} = e^{-i.(\pi/2+2k\pi).b} = e^{-i.(5\pi/2).b} = e^{-i.(5\pi/2).10}$ ……..…….. (b)

Equation (b) fits , *as minimum* , in the Planck length and is $L_p = e^{-i.(5\pi/2).10}$ ……(c)

Equation (c) is the smallest **Energy-Unit of Space** ,and this because of **s = 0** and **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 → $z^{1/w} = (s + \bar{v}\ \nabla i\ )^{1/w} = |zo|^{-w}.[\cos.(\varphi + k\pi)/w + i.\sin.(\varphi + k\pi)/w] =$

$= |zo|^{-w}\ .\ e^{-i.(\varphi+k\pi).w}$, where for $\cos.(\varphi+k\pi)/w = 0$

exists only the **Imaginary-Part** of monad , ($\mathbf{v}\therefore \nabla i\ ) \neq \mathbf{0}$, where $\varphi = \pi/2$ and then ,

$z^{1/w} = |zo|^{-w}.e^{i.(\varphi+k\pi)/w} = e^{-i.\left(\frac{\pi}{2}+k\pi\right).10}$ and it is the ***Diffraction Energy mechanism***

while for **minimum-Space** $r = e^{-i.\left(\frac{\pi}{2}\right).b} = 0$, $207879576.b = 1{,}507019.10^{-7}$ m

for all Space Levels of quantization which are , **The Energy Particles only** i.e.

The Energy particles in Stationary caves as $z^{1/w} = |zo|^{-w}.L\,v$ = Energy Monads .

Extending Quantization of Energy according to exponential formula , $L_v = e^{-i.(5\pi/2).10}$

on the decimal base b = 10 then for k = ± 1 → ± ∞ , are found the Energy caves as

For base e = 2,71828 and base b = 10 then e^ - (15,707963) = 1, 507 .10 $^{-7}$ m

which is the Space-Part as $L_S = e^{i.(-\pi).b} = e^{-i(-31,41593)} = 2$, 27110104 .10^{-14} m

For base e = 2,71828 and base b = 10 then e^ - (47,123889) = 3, 42259 .10 $^{-21}$ m

For base e = 2,71828 and base b = 10 then e^ - (62,831853) = 5, 15790 .10 $^{-28}$ m

For base e = 2,71828 and base b = 10 then e^ - (78,5398) = 7, 7730546 .10 $^{-35}$ m

or $e^{-.(78,5398)} =$ **8, 906**.10^{-35} m = { $\sqrt{3}.\pi.$ **1,616199**.10^{-35} m } ≡ L_P = Planck`s Length

For base e = 2,71828 and base b = 10 then e^ - (109,95574) = 1, 76534 .10 $^{-48}$ m

For base e = 2,71828 and base b = 10 then e^ - (141,37166) = 4, 00929 .10 $^{-62}$ m

i.e. The **min**imum **Energy-cave** for the **Primary-Particles** is that of $\mathbf{10^{-21}}$ **m** while

The **max**imum **Energy-cave** for the **Primary-Particles** is that of $\mathbf{10^{-11}}$ **m** , and

The **min**imum-**1D-Space-cave** for the **Primary-Particles** is that of $1{,}507.\mathbf{10^{-7}}$ **m**

The **min**imum-**2D-Space-cave** for the **Primary-Particles** is that of $2{,}271.\mathbf{10^{-14}}$ **m**

The **min**imum **-3D-Space-cave** for the **Primary-Particles** is that of $3{,}423.\mathbf{10^{-21}}$ **m**

or the 3D-cave → $\mathbf{1.10^{-16}}$ **m** , in where The **Strong** and **Weak- Forces** converge to one value → $10{,}65.10^{25}$ eV ≡ $10{,}65.10^{16}$ GeV ,

meaning that Forces are Quantized in their Energy-Caves which are Energy-monads , where

Weak - force is as $Q_+.r = [\frac{g.S}{2\pi r^2}] < 1.10^{17}$GeV for amplitude $r \rightarrow 10^{-16} < r < 10^{-11}$ m

Strong - force is as $Q_+.r = [\frac{g.S}{2\pi r^2}] > 1.10^{17}$GeV for amplitude $r \rightarrow 10^{-21} < r < 10^{-16}$ m

Strongest-force is $Q_{++}.r = [\frac{g.S}{2\pi r^2}] = 1.10^{22}$GeV for amplitude $r \rightarrow 10^{-27} < r < 10^{-21}$ m

3... Hydrogen-CAVE → 1-Proton [⊕] , 1-**Electron** [⊖] , **1-Neutron** [⊕∪↺⊖]–[⊕↔⊖]

Hydrogen is→ [p n e] ≡ $[\frac{3}{3} + 0 - \frac{3}{3} + W^+] \equiv$ $(0\,|\mathbf{W^+Z^o}) =$ One Proton and One Electron .

Interaction of Proton and Electron is → $\mathbf{p\,e} \equiv [+\frac{3}{3} - \frac{3}{3} + \mathbf{W^+Z^o}] \equiv \Sigma\ ^{[N_p+N_e]}_{e\rightarrow}$ and the Summation of

Nucleus-Charges [p + n] of Cave N^{p+n}**, attacks** >> the Electron [e = -1] of Cave $H_{N\cup e}$

creating Destructive-Interference $[\oplus\cup\ominus=0] \equiv [+1-1+\mathbf{Z^o}]$ or , $CI\ ^{+}_{+} \equiv [1|W^+] + DI\ ^{+\rightarrow -}_{++} \equiv \mathbf{Z^o}$

and [p n e] ≡ $(0\,|\,\mathbf{W^+Z^o}) = -8{,}72.10^{-20}$ J = - 5,45.10^{-1} eV = - 0, 545 eV

The Process from measurements ,

1… DATA .

From $\mathbf{m_p}$ = Resonance M_{Tp}= 3,1458799.10^{-30} Kg ,
$\mathbf{m_{N-E}}$ = 0,511 eV= 0,511.[1,7826614.10^{-36}] = 9,109399.10^{-35} Kg
$\mathbf{m_n}$ = Resonance M_{Tn}= 3,3425529.10^{-30} Kg

The Atoms Total-Harmonic mass ≡ M_A is → $\frac{1}{M_A} = \frac{1}{m_P} + \frac{1}{m_n} + \frac{1}{m_e} = \frac{10^{30}}{3,146} + \frac{10^{30}}{3,343} + \frac{10^{35}}{9,109}$ = $\frac{10^{31}}{31,46} + \frac{10^{31}}{33,43} + \frac{10^{3}.10^{31}}{0,9109} = \frac{105,17078.10^{35}}{958}$ and the **Total-mass** M_{N-E}= 9,10899.10^{-35} Kg ...(1)

The Total-Harmonic-**Nucleus-Charge** ≡ $Q_T \equiv q_p \pm 0$ = 1,6022.10^{-19} = 1,6022. 10^{-19} C
and the **System-Resonance-Charge** Q_N = 1,6022. 10^{-19} C ……...(2)

The frequency of the Closed-Nucleus-Orbit-System becomes from Kepler second Planetary law equation , 4 π² m f^2_o = k , and constant law of Areas 1 = k .$\mathbf{f^2_o\ a^3}$. Their common k , is Constant-Energy → k = 4 π² m $f^2_o = \frac{1}{f^2_o\ a^3}$ or , $f^4 = \frac{1}{4\pi^2 m a^3}$ and $f = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}}$ ...(f)

With this way , ***Impedance ≡ 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 **m** = M_T = 9,10899.10^{-35} 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}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_{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 = $\frac{2\pi.9,10899.10^{-35}..[1,3099329.10^{15}]}{[1,6022.10^{-19}]}$ (Kg/C.s) = **46,793163** Tesla ...(4) i.e.

$\mathbf{\bar{B}_F}$ **= 46,793163** Tesla → ***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 .

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} m , and the **Resonance - Energy** $\mathbf{E} = \frac{1}{a^3}\left[\frac{4\pi^2}{c^2} + \frac{L^2}{2m}\right]$, where
L = the Spin S = 5,691952. 10^{-34} {Kg/m/s} , System-mass M_{N-E} = 9,10899.10^{-35} Kg ,
c ≡ 2,998.10^8 m/s **.** and **E** = [1,4166682.10^{22}] x [4,3923448.10^{-16} + 1 ,7783703.10^{-33}] =
6,2224952.10^6 J + 2,5193606.10^{-11} J → 3 ,8837193.10^{25} eV + 1 ,5724382.10^{-30} J ….(E)

The **Strong Forces , $\mathbf{W^+Z^o}$,** in System is the **Hydrogen** [p n e] ≡ $[\frac{3}{3} + 0 - \frac{3}{3} + W^+]$ **≡**(0 $\mathbf{|W^+Z^o}$)
which may be calculated from the Time needed , for Harmonic-mass to vibrate in cave **r** ,
From Energy equation $\mathbf{r} = \frac{m.v}{q.B} = \frac{[9,10899.10^{-35}\ Kg].2,9978.10^8}{1,6022.10^{-19}.[6,793163]}$ = **3, 642283.10^{-9}** m ….(5)

and for Strong Forces **, $\mathbf{W^+Z^o}$,** in cave **d =10^{-9}** m then Period **T** = $\frac{\mathbf{d}}{\mathbf{c}} = \frac{3,642283.10^{-9}m}{[2,998.10^8 m/s]}$ =
= **1,2149042.10^{-17}s** , and The produced Energy in Hydrogen cave **d** , is → $\mathbf{E_{W^+Z^o}}$ = $\underline{h}$ / T =
= $\frac{1,055.10^{-34}\ J.s}{2.[1,2149.10^{-23}s].[1,602.10^{-19}J/eV]}$ = 0,2709965. 10^2 ≡ **27, 10 eV** …..(6) and from Coulomb Force $F_C = \frac{C.Q}{r^2}$ and Voltage $V_C = \frac{C.Q}{r}$, then **Force** [F_C] x **Cave** [r] = **Voltage** [V_C] → so Nucleus-Forces $\mathbf{W^+Z^o} = \left[\frac{E_{W^-Z^o}}{r}\right] = \frac{27,09965}{3,642283.10^{-9}}$ = **7,4402922.10^{-9}** eV ...(7) or Strong-Forces

$\mathbf{W^+Z^o}$ ≡ $\left[\frac{h/T}{2.r}\right] \equiv \left[\frac{h.c/d}{2.r}\right] \equiv \frac{h.c}{2.d.r} \equiv \left[\frac{\mathbf{h.c}}{\mathbf{2e.r^2}}\right]$ eV = $\frac{1,055.10^{-34}\ J.[2,998.10^8 m/s]}{2.\left[1,602.\frac{10^{-19}J}{eV}.[3,642283.10^{-9}]^2\right]}$ = **7,4429.10^{-9}** eV

Neutron **n ≡** (0 $\mathbf{|W^-Z^o}$) with Zero Charge , when is found in a Voltage $\mathbf{V_r = F_c . r}$ and then is executed on it the Weak Forces (0 $\mathbf{|W^-Z^o}$) = **- 7,4429.10^{-9}** eV **,** meaning that Δ_{Z^o} = 1,48858. 10^{-8} m which is the Weak-force Range for Neutrons .

4... The Gravitational constant G ≡ Φ². [{σ Φ}≡ 2πf_P r ≡ $\frac{2B}{\pi r^3}$ ≡ w r ≡ $\bar{v}$ ≡ ma ≡ m g ≡ $\bar{c}$]

5h... The Periodic motion in all Displacements :

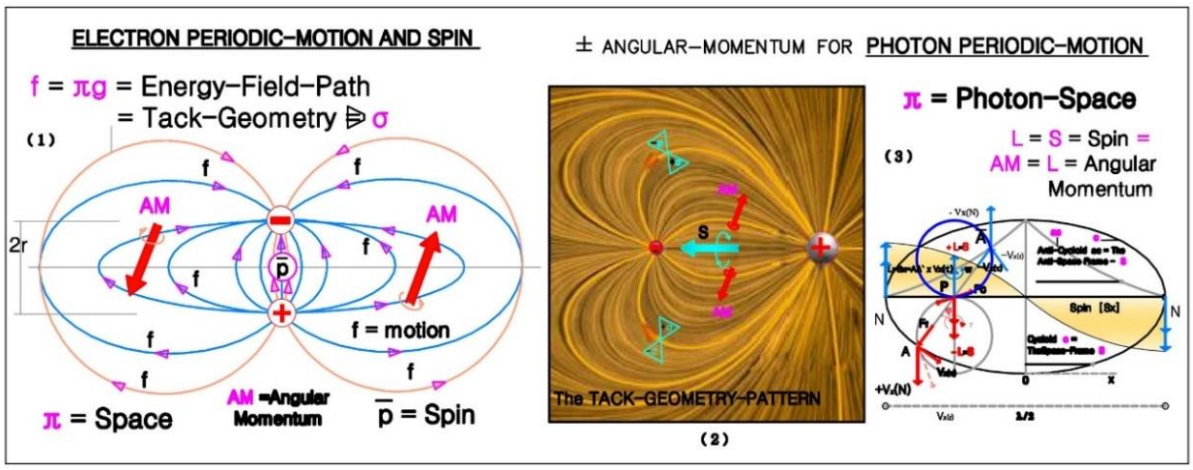


Figure – 29- : The Two Possible motions in caves , **The Periodic** and **The Rotational** :
In (1). Is formatted the Energy-Space of the ***Orbital-Periodic-motion*** [⊕<→ to ⊖] in ***Tack-Geometry-Pattern*** (1) and (2) formulation , where Hydrogen minimum cave **a** is $a = \sqrt[3]{\frac{1}{k.f^2}} = \sqrt[3]{\frac{1}{g.f^2}}$, and for k = g , and f = E / h =13,6 eV/h = Unit-**Energy-Space**-frequency f = 3,28393.10^{15}/s , of cave a = 2,1127839.10^{-11}.10^{-11}m . From Linear-Periodic-motion $\frac{w_n}{2\pi} = \mathbf{f_e} = \frac{1}{2\pi}\sqrt{\frac{k}{m}}$, or $4\pi^2 f^2_e .m_e = k = \pi g$, then for Electron $m_e = \frac{g}{4\pi f^2_e}$ so , $\mathbf{m_e} = \frac{g}{4\pi f^2_e} = \frac{9{,}808238}{4.\pi.[3{,}28399.10^{15}]^2} = \mathbf{-\ 7\ ,\ 2373149.10^{-32}}$ kg , $\mathbf{f_e = 3,\ 283998.10^{15}}$ /s ,
The Spin-Cave is equal to The Moment of couple from two ↑↔↓Angular-momentum Vectors as $\bar{B} = \mathbf{a\ m\ v}$ = 2,1127839.10^{-11} m .7,2373149.10^{-32} kg .2,99798. 10^8 = 4,5841758.10^{-34} / π , and Spin → **S/2 = 1,4591885.10^{-34}** which is the **Electron-Spin**.
The k = π g , denotes the ⊕ **Space** ≡ Electric-field in-where exist the Electric-lines the tracks for the motion of electrons ⊖ **Anti-space** . The Right angular momentum vector AM ≡ ↑ is the Produced **Work and stored in Magnetic-field as motion** while left-vector AM ≡ ↓ is the Produced Work and stored in the Opposite Magnetic field as motion and both consist the **Dipole-vector** [⊕↻®↺⊖]directed to [⊕→⊖] as it is ***Tack-Geometry.***
For Quantum-Energy equal to **g** then k = g , and → $a = \sqrt[3]{\frac{1}{k.f^2}} = \sqrt[3]{\frac{h^2}{k.E^2}}$, or $a_m = \sqrt[3]{\frac{h^2}{g.E^2}}$ the corresponding cave **a** is 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.(2r).c.sin 2φ 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 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 → S =AM / π = r m v = [a m c] / π →

Spin $S = [\frac{amc}{\pi}] = \bar{B} = \frac{2L}{\bar{w}} = \frac{2L}{2\pi f} = \frac{\pi^2 r^4 . f}{2}$ = The Spin of Particle-cave .

Above **Double-Orbital-Periodic motion** [⊕<→⊖] in a Material-Point is the eternal-Plane-Curve-motion of the ⊕ constituent to the ⊖ constituent in the two x, z, axis of motion . Considering the distance of motion be , the diameter of the cave , *l* = 2r , then velocities as angular velocity ,**w**, and velocity ,**v** ,under the condition y(2r,0) = 0 , then leads to 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, $\lambda = \frac{c}{f}$ and is the wavelength and , **f** , is the frequency of oscillation , ***i.e.*** The , **n = 1** ,defines ***a Normal mode vibration*** with **natural frequency** → $\mathbf{f_n = \frac{v}{2\pi r} = \frac{\sigma}{4\pi r}\ [1+\sqrt{5}\ ]}$ ….(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 $\bar{r} \equiv$ ***Space*** , is Perpendicular to $m\bar{v} \equiv$ ***The Energy*** . 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 squaring $-\nabla\bar{r}^2 + [2\pi mf\bar{a}]^2 = 0$ issues $\bar{\mathbf{r}} = \mathbf{-\ 2\pi mf.\bar{a}}$ ...(**1**)
The condition for ***Irrotational Energy*** is → $\nabla x\bar{B} = \nabla x\bar{S} = 0$, or $\nabla x\bar{B} = \nabla\bar{r} + 2\pi mf.\bar{a} = 0$,

and vector $\bar{\mathbf{r}} = \mathbf{2\pi mf.\bar{a}}$ …..(**2**) . Relations (1) , (2) , $+\bar{\mathbf{a}}$ and $-\bar{\mathbf{a}}$, denote the **Alternative-Positions of Magnetic Field** in the **Two-transverse-Positions** as in Fig 20-(2).

For Photons which force is $F_{photon} = \frac{[\oplus<\rightarrow\leftarrow\ominus]}{r^2} = \frac{[\sigma.\sigma]}{r^2} = \left|\frac{\sigma.}{r}\right|^2 = \left|\frac{2\pi f.}{\Phi}\right|^2 = \left|\frac{2\bar{B}.}{\pi.\Phi.r^4}\right|^2$,issue above .

Since for Electron $4\pi^2 f^2{}_e .m_e = \mathbf{k} = \boldsymbol{\pi}\, \mathbf{g}$, then for Gravity issues , $-\nabla E = -\nabla g = 4\pi.m_e f^2{}_e$.

$$\bar{\mathbf{q}}_{\text{Photon}} = \frac{G}{\sqrt{2}.f} = \frac{G.h}{\sqrt{2}.E} = \frac{[6{,}680561\,.10^{-11}].[6{,}62606957.10^{-34}]}{\sqrt{2}\,.E=1} = 3{,}13\ 10^{-44}\ \text{C}\ .$$

All above Physical Structures Vibrate , *In-Sectors* with minimum Energy **, and form the → Electron-charge ←*In Surfaces*** with minimum Energy **, and thus forming the Orbits .**

The Orbit relation $\mathbf{r^3 f^2_p = Constant}$,as multiplication of Space-cave **r** and frequency **f ,** is Energy , **The Unit-Work done ≡ motion** ,and conserved in orbit **r** as the **n** frequencies f_n , and after filling **the minimum cave** Burst Into another cave **connected to G** $= \Phi^2[2\pi r f_P \equiv \frac{2B}{\pi r^3}]$

A…Remarks on EPR Argument :

The Point like Particles of Quantum Mechanics in Vacuum , are the three Elements , [66-68] [$s^2 = v^2 \equiv \oplus$ **,** $2s^2 = 2v^2 \equiv \varnothing$, $-\mathbf{s^2} = -v^2 \equiv \ominus$] , which are the content , *Primary material* , of the Cosmic Particles .[91] .The extension for a Deeper existence of the Particles is defined in Coulomb-Energy equation where Force $F_C = \frac{C.Q}{r^2}$ and Voltage $V_C = \frac{C.Q}{r}$,and so $V_C = r\,.\,F_C$ or **Force** $[F_C]$ x **Cave** $[r]$ = **Voltage** $[V_C]$, i.e. Voltage of caves defines Forces in caves .

The Presented NEW Interaction Method , [6.i.] is Based on the Common-Knowledge of the **Constructive** and **Destructive Interference of Waves** ,Since Particles are Waves **.** For l-rays

EG ≡ Light ray → $\bar{v}$.[. $\boxed{\bar{f}_n}$ + f_n] ≡ Straight line ≡ $\bar{\mathbf{v}}$.[f_n] ≡ ***The Euclidean***-Geometry

HG ≡ Light ray → $\bar{v}$.[. $\boxed{\bar{f}_n}$ + f_n] ≡ A Circle ≡ $\boxed{\bar{f}_n}$ ≡ ***The Hyperbolic***-Geometry

RG ≡ Light ray → $\bar{v}$.[. $\boxed{\bar{f}_n}$ + f_n] ≡ A Line-Sector ≡ $\bar{\mathbf{v}}.\boxed{\bar{f}_n}$ **≡** ***The Riemann***-Geometry

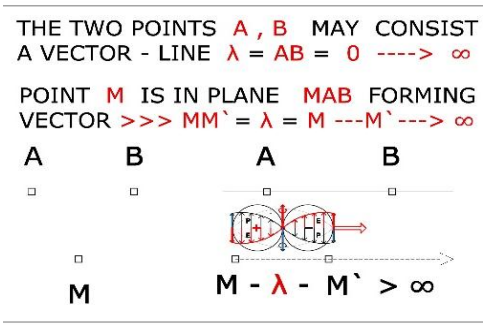
MG ≡ Light ray → **A Line-Sector in Caves** , and **Straight line to Infinite** as ,

[$\oplus\leftarrow\lambda\rightarrow\ominus$] → $\boldsymbol{\lambda}$ ← [$\oplus\leftarrow\lambda\rightarrow\ominus$] ≡ $\bar{v}$ [$\boxed{\bar{f}_n}$ + f_n] with Wavelength $[\bar{\mathbf{v}}.\boxed{\bar{f}_n}]$ → $[\bar{\mathbf{v}} = \bar{\mathbf{c}} = \lambda\frac{f}{\Phi}]$

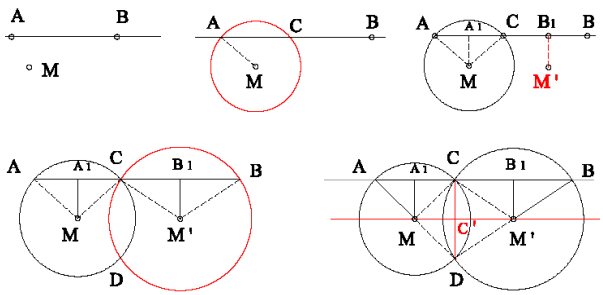
[MG] [MG] [MG] ≡ The Dual-nature of Light-Photon of **Material-Geometry**[9].

The answer is left to the Reader → Markos Georgallides 25/9/2020 ←

The Method in → (F-1) (F-2)



B... A shor t Pres



entation of Proving above from [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 i.e. for any point M on line AB where is holding MA+MB = AB / meaning that lines MA , MB coincide on AB / is thus 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 the 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 < MA_1A = MA_1C (CN_1) and since the sum of the two angles < MA_1A+MA_1C = 180° (CN2, 6D) then angle < MA_1A = MA_1C = 90 °.(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 $< A_1MC' = A_1CC'$. (Cn 2,Cn3,E.I.15) Because $M'B_1 \perp CB$ and also $M'C' \perp$ CD then angle $< B_1M'C' = B_1CC'$. (Cn2, Cn3, E.I.15)

b.. The sum of angles $A_1CC' + B_1CC' = 180° = A_1MC' + B_1M'C'$. (6.D) , and since Point C′ lies on straight line MM′, therefore the sum of angles in shape $A_1B_1M'M$ are $< MA_1B_1 + A_1B_1M' + [B_1M' M + M'MA_1] = 90° + 90° + 180° = 360°$ (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 $< A_1MM' = B_1M'M$, and since their sum is 180° as before (6D) , so angle $< A_1MM' = B_1M'M = 90°$ (Cn2).

d.. Since angle $< A_1MM' = A_1CC'$ and also angle $< B_1M'M = B_1CC'$ (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.ε.δ.)

e.. The right-angle triangles A_1CM , MCC′ are equal because side $MA_1 = C'C$ and MC common so angle $< A_1CM = C'MC$, and the Sum of angles $C'MC + MCB_1 = A_1CM + MCA_1 = 180°$

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 $C'MC + MCB_1 = A_1CM + MCB_1 = 180°$

B.2 Proofed Succession

1.. The mid-perpendicular of CD passes through points M , M ′.

2.. Angle $< A_1MC' = A_1MM' = A_1CC'$, Angle $< B_1M'C' = B_1M'M = B_1CC' < A_1MC' = A_1CC'$ because their sides are perpendicular among them i.e. $MA_1 \perp CA$, $MC' \perp CC'$.

a..In case $< A_1MM' + A_1CC' = 180°$ and $B_1M'M + B_1CC' = 180°$ then $< A_1MM' = 180° - A_1CC'$, $B_1M'M = 180° - B_1CC'$, and by summation $< A_1MM' + B_1M'M = 360° - A_1CC' - B_1CC'$ or the Sum of angles $< A_1MM' + B_1M'M = 360 - (A_1CC' + B_1CC') = 360 - 180° = 180°$

1.. The sum of angles $A_1MM' + B_1M'M = 180°$ because the equal sum of angles $A_1CC' + B_1CC' = 180°$, 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 $A_1MM' = B_1M'M$ and since their sum is 180 °, therefore angle $< A_1MM' = MM'B_1 = M'B_1A_1 = B_1A_1M = 90°$

3..Since angle $A_1CC' = B_1CC' = 90°$, 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 $< A_1CM = C'MC$ and since the sum of angles $< A_1CM + MCB_1 = 180°$ then also $C'MC + MCB_1 = 180° \rightarrow$ which is the second to show , as this problem has been set at first by Euclid.

b.. 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 → ∞) , 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)

C.. A Line Contains at Least Two Points, is Not an Axiom Because is Proved as Theorem

3.. 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 .

D.. 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 → ∞ , 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⊥AB = 0 → AB → ∞) , 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 → P → ∞ , 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 → W = ∫A-B [P.ds] = Σ P.δ = 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-parallels. 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 , they follow Objective Logic of Nature which is the meter of all logics . Answers also to those who compromise incompatibility by addition or mixure.
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 = 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 [$\nabla i=2(wr)^2$] 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** ??? , 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. 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 **Points** and that of **Energy**. [21] . The **Material-Geometry** is the answer , where Photon-Particle is
The moving-storage $\mathbf{[\bar{v}\,.\boxed{\bar{f}_n}\,]} \rightarrow$ with inner velocity and wavelength $[\bar{\mathbf{v}} = \bar{\mathbf{c}} = \lambda\frac{f}{\Phi}]$ of Stationary-Store
$[S \equiv EM\text{-}R \equiv f_{1=N}\,, f_2\,, f_3, f_D\,, f_n = w^2]$, as 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 $\{W \equiv EM\text{-}R \equiv [\varepsilon E^2 + \mu B^2] = 2.\lambda c.\sin.2\varphi\}$ from stresses $\bar{\mathbf{v}}\ \mathbf{[\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}]} \equiv \bar{\mathbf{v}}\ .\mathbf{[.\boxed{\bar{f}_n} + f_n\,]}$, 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 [$\bar{\mathbf{v}}.\mathbf{f_n}$] $\rightarrow$
Fundamental-frequency [$f_1 = (E^2+H^2) = n\frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\bar{B}}{\pi^2 r^4}] \rightarrow \{W \equiv EM\text{-}R \equiv [\varepsilon E^2 + \mu B^2] = 2.\lambda c.\sin.2\varphi\}$.

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 Line-Sector [$\oplus \leftarrow \lambda \rightarrow \ominus$] , of the Continuously Parallel Postulate and Not of the Infinite Planes and Volumes .***The Four Planes denote the minimum Volume-Structure of nature***

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** which are the **Two Points only**,[$\oplus \leftarrow \lambda \rightarrow \ominus$] and **Energy** which is the motion [$\leftarrow \rightarrow$] **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 $\overline{ds} \equiv \overrightarrow{AB}$, which is the first dimensional Unit [Zenon Paradox – [13] , and this is so because Vector **AB** has Position [AB] and Direction $\overrightarrow{AB}$. i.e. $\overrightarrow{\mathbf{AB}}$ **Line-Vector** , ***of Two Points only*** , is the **Light - Ray** such for Stationary-Caves $\bar{\mathbf{v}}.\boxed{\bar{f}_n}$, as for Waves $[\bar{\mathbf{v}}.f_n]$ on straight-lines to infinity .

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 TwoAperon , $+\infty$, $-\infty$,which consist a Huge Magnet with Infinite Parallel-lineswhere the $\oplus$ constituent Attacks , ***is moving to*** ,*the case of Newton-Gravitational-constant* G-*force* ***Periodically*** to the $\ominus$ constituent [82-86] . The Newtonian Constant of Gravitation G is related to Gravity **g** , as $G = E = h \,.\, f_n = [\frac{\mathbf{c.r^3}}{\mathbf{a^3}}].[\, g_L\, k_L\,] = g\,.k_E = g\,.[\, g_L\, k_L\,]$, and is transformed into all types of motion i.e. Total Energy , velocity , mass , light velocity , Weight and generally as ,

Force $G \equiv \sigma.\Phi^3 \equiv \Phi^2.[\{\sigma\,\Phi\} \equiv [\frac{2B}{\pi r^3}] \equiv 2\pi f_P\, r \equiv w\, r \equiv \bar{v} \equiv m\, a = m\, g = \bar{c}\,] \equiv 6{,}674.10^{-11}(\frac{Nm^2}{Kg^2})$

Stress $\{\, \boldsymbol{\sigma}\, \Phi\,\} \equiv [\frac{\mathbf{2B}}{\pi r^3}] \equiv 2\pi.\mathbf{f_P}\, r \equiv w\, \mathbf{r} \equiv \bar{\mathbf{v}} \equiv m\, \mathbf{a} = m\, \mathbf{g} = \bar{\mathbf{c}}\,]$, 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 Stability.** The **Un-bonded-Force** , **G** , or the **Gravitational-constant** , **G** , was shown to be [81B] the **Electric-Field-lines of a Dipole-Magnet**, i.e.

That we call , **SPACE ,** is a **Huge-Electrostatic-Magnet** which is created from the **Infinite-Dipole-Opposite-Primary–Charges which is** The-**ENERGY**- Part of the Two-**Primary**-Points $\overrightarrow{\oplus}$ to $\overrightarrow{\ominus}$ only . [82-86] .

The extension for a Deeper existence of the Particles is defined in Coulomb-Energy equation where Force $F_C = \frac{C.Q}{r^2}$ and Voltage $V_C = \frac{C.Q}{r}$ coexist , so $V_C = r\,.\,F_C$, or **Force** $[F_C]$ x **Cave** [r] = **Voltage** $[V_C]$, i.e. Voltage of Caves defines Forces in Caves .

The Stress $\boldsymbol{\sigma}$, occupies Minimum and Maximum because is related to frequency and velocity as $\rightarrow\ f_{ph} = [\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}] \equiv \frac{\sigma+\sigma\Phi}{2\pi r} = \frac{\sigma[1+\Phi]}{2\pi r} = \frac{\sigma[\Phi]^2}{2\pi r}$, or $\boldsymbol{\sigma} \equiv \frac{\mathbf{f_{ph}.2\pi.r}}{\boldsymbol{\Phi}^2} \equiv \frac{\mathbf{w.r}}{\boldsymbol{\Phi}^2} \equiv \frac{\mathbf{v}}{\boldsymbol{\Phi}^2} \equiv \bar{\mathbf{c}}\frac{\mathbf{1}}{\boldsymbol{\Phi}^2}$

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 **G** as $\rightarrow G = F = \sigma\, A = (2\pi f\, r)\frac{A}{\Phi} = wr\frac{A}{\Phi} = \bar{v}\,\frac{A}{\Phi} = \sigma\,\Phi^3$.

This **Stationary**-Energy-Storage follows the **Coulomb Electrical-Force** where the Electrical Force is added ,while for Photon ,an **Moving**-Energy-Storage ,exist **Gravitational-Forces** as $\mathbf{F_{electron}} = k_c\,\frac{\mathbf{Q_1.Q_2}}{d^2} = \frac{[\oplus<\rightarrow\leftarrow\ominus]}{d^2} = k_c\,\frac{2\sigma}{|e|^2} = k_c\,[\frac{4\pi f_1}{r\Phi}] = k_c\,\frac{\sigma}{2r^2} = \mathbf{k_c}\,\frac{\mathbf{2\bar{c}}}{\mathbf{r^2\Phi}}$ in Box B_e , and for **Motion**

$\mathbf{F_{photon}} = \frac{[\oplus<\rightarrow\leftarrow\ominus]}{r^2} = \frac{[\sigma.\sigma]}{r^2} = \left|\frac{\sigma.}{r}\right|^2 = \left|\frac{2\pi f.}{\Phi}\right|^2 = \left|\frac{w}{\Phi}\right|^2 = \left|\frac{2L}{\Phi\bar{B}}\right|^2 = \left|\frac{\bar{c}}{r.\boldsymbol{\Phi}}\right|^2$, in the same Box B_e , since

Angular-momentum ≡ **Spin** $\equiv \bar{B} = \frac{\pi r^3\sigma}{4}\,[1+\sqrt{5}\,] = |\frac{\pi r^3\Phi\sigma}{2}| = [\frac{\boldsymbol{\pi r^3.\bar{c}}}{\mathbf{2}}]$, as the Orbit-Forces .

It is shown that Force , G , occupies Mass , **m** , from velocity , and Charge , **q** , from Stress, therefore **G** is an Gravitational-Force as $\mathbf{F_{ele}}$ **,** and an Electromagnetic-Force as $\mathbf{F_{pho}}$,

$$G = E = h\,.\,f_n = [\frac{\mathbf{c.r^3}}{\mathbf{a^3}}].[\, g_L\, k_L\,] = g\,.k_E = g\,.[\, g_L\, k_L\,] \equiv \boldsymbol{\sigma}\ x\ \Phi^3 = (2\pi f\, r)\frac{A}{\Phi} = \bar{\mathbf{v}}\,\frac{A}{\Phi}$$

Since for the **First Chemical-Neutral-*material-cave*** , **r** , constants , g_L, k_L are equal to unity **i.e.** $\mathbf{g_L = k_L = 1}$, then above Energy of E =13,6 eV in Hydrogen-Plane-orbit corresponds to the **minimum-energy-cave → The Phys-Quantized-Energy-Structure**. Since **G** Pushes → **g** on the Earth-Unit-coefficient , k_E , and because is the ***Starting ,*** *for first time begins* , of this ***Mechanism*** then from $G = g.[g_L k_L] \equiv g.[1*1] \equiv \rightarrow g$, or $\mathbf{G = g}$, meaning that in Earth System of gravity , the Newton`s Gravitational constant , **G** , and Gravity **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* , G** , ***is the mechanism*** , *the mould* for the **First-kick-Start ,** upon this Unit-Granular-Energy-Stress-Layer , **g** , to formulate in that orbit , **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 → [⊕← λ →⊖] → **λ** ← [⊕← λ →⊖] .

2.. Gravity-Force :

The Gravity-System , is an Infinite of ± 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 → $\nabla x\bar{B} = \nabla x\bar{S} = 0$, or $\nabla x\bar{B} = \nabla \bar{r} + 2\pi\, mf.\bar{a} = 0$, and $\bar{\mathbf{r}} = \pm 2\pi mf.\bar{\mathbf{a}}$. Vector $\bar{r}$, occupies Both directions for Rotational-equilibrium , **i.e.**
The vector $\bar{\mathbf{r}} = \pm\, \bar{\mathbf{B}} \equiv \bar{S}_n = 2\pi m \mathbf{f_n}$, and $\mathbf{f_n} = \frac{B}{2\pi\, m_e} = \frac{E}{h}$ **, is the Stationary-Filling-Ocean of the Spinning-Gravity-Material Points , in the called Empty-Space** ,with frequency that of Material-Point $f_n = n.f_1 = \frac{E}{h} = \frac{n.v}{2\pi r} = \frac{n\sigma}{4\pi r}[1+\sqrt{5}\,] = \left|\frac{\sigma.\Phi}{2\pi.r_n}\right|$, and from $v = w\, r = 2\pi f\, r$ then , $\mathbf{f_n} = v/2\pi r = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\sigma.\Phi}{2\pi.r_n}$, and $\bar{\mathbf{v}} = \boldsymbol{\sigma}\,.\,\boldsymbol{\Phi}$ ...(**a**) , and ± Spin $\mathbf{S_G} = \bar{\mathbf{B}} = J\, w = \boldsymbol{\pi}^2.\, \mathbf{r}^4\, .\, \mathbf{f_{n=g}}$
i.e. ***Gravitational-Constant*** **Force ≡ 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 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 $[2^3 = (\oplus \leftrightarrow \ominus)^3]$, The Impedance , g_Z , of the 3D-Space is → ln(3) ← and of Anti – Space is → $\pi\sqrt{3}$ ← and this because consist the moulds of Growth [45] . From above ,
→ **The Light velocity vector** $\bar{\mathbf{v}} = \bar{\mathbf{c}}$ is **Acting on cave** , $\mathbf{r = L_P}$, and finding **Impedance** , $\mathbf{m_g}$, **becomes the Centrifugal-Force** $\mathbf{F_g}$ of **Cave** and becomes the **Gravity g** ← as ,
$\mathbf{F_g} = m_g[\frac{c^2}{r}] = J\, w^2 . \frac{c^2}{r} . g_Z = [\frac{\pi r^4}{2}].[\frac{c}{r}]^2.[\frac{c^2}{r}].\{2^3.\ln(3).\pi\sqrt{3}\} = \mathbf{4\sqrt{3}\ ln(3)\ .\pi^2\ r\ c^4}$, or
Gravity → $\bar{\mathbf{g}} = \mathbf{4\sqrt{3}\,.\ln(3)\,.\ \pi^2\ L_P\, c^4}$ ← **i.e.** → For the **In-Planck`s-length**
It is the Centripetal-Force , $F_g = \bar{g}$ **, of The Pointy-Spinning** Material-Points $\mathbf{S_{pg}} = \bar{\mathbf{B}} =$
$= 4.\sqrt{3}\,.1{,}0986122886681.\pi^2.1{,}616199.10^{-35}.[2.99819938]^4 = \mathbf{9\ ,\ 8076754\ .}$
Moreover from relation $(4\pi a^3/3)^3 = 1{,}616229.10^{-35}$, $a = 5{,}447.10^{-11}$, or semi-major axis of Hydrogen cave is $a = 10^{-11}$ m , and $a = 2x = 2\ ,1145016.10^{-11}$ m . Placing in Hydrogen-Rim Period **T** , and Prior Semi-major axis **a** , then→ $\mathbf{k} = \frac{T^2}{a^3} = \frac{[3{,}04513.10^{-16}]^2}{[2{,}1145016.10^{-11}]^3} = \frac{9{,}2728109.10^{-32}}{9\ ,4541768.10^{-33}} =$
9, 808238 $\frac{s^2}{m^3} = \frac{N}{Kg}$, a Constant-Energy-Unit , ***agreeing with Gravity constant*** **g** , *measured.*
For the **Out-Planck`s-length** Photon-velocity equation $\bar{v}_m = \mathbf{n}.\bar{\mathbf{c}}\ .\{\ \boxed{\bar{f}_n} + \mathbf{f_n}\ \}$ and from $\bar{v}_m = w\, r = \mathbf{n}.\boldsymbol{\pi}.\mathbf{c}$, $f = [\frac{\mathbf{n.c}}{\mathbf{2r}}]$ **,** then → $\bar{v}_m = \mathbf{n}.\bar{\mathbf{c}}\ .\{\ [\ \boxed{\bar{f}_n} + \mathbf{f_n}\ \}$ ← **which is velocity-Out** $\mathbf{L_P}$.
Photon was proved to be a Material-Point in cave , **r** , where its **Inner Storage** is ***The Stationary-Standing-wave*** the Electromagnetic-Wave $[E^2+H^2] = 2(2r).c.\sin 2\varphi$ with **n** Lobes representing the ***Normal mode vibration*** with frequencies $f_n = n\,.\,f_1 = \frac{E}{h} = \frac{n.v}{4r} =$
$= \frac{n\sigma}{2\pi r}[1+\sqrt{5}\,]$, on Two or more Possible nodes of the Standing-Wave , $\oplus\ \lambda/2\ \ominus$ **.**
The two Spaces ⊕ and Anti-Space ⊖ Exist on the Two opposite-nodes of the Standing-wave wavelength , **λ ,** and for the **Outward Storage** *is the Propagating Electromagnetic- Wave* as ,
→ $\{[\varepsilon E^2+\mu B^2] = 2.\lambda c.\sin.2\varphi\}$ ← *where* , **Particle** $2r = n\,\lambda = \mathbf{n}.\bar{\mathbf{c}}\ .\{\ \boxed{\bar{f}_n}\ \}$. The Cave **r** ,is the ***Electromagnetic-Energy-Storage ,*** and equal to → $\mathbf{n}.\bar{\mathbf{c}}.\{\ \mathbf{f_n} = \frac{E}{h}\ \}$ which is Electromagnetic - Radiation E , B ,which is the **Wave Conveyer of Cave** , **r ,** with frequency **f** = Energy E / h .
From relation Stress $\boldsymbol{\sigma} = \frac{\mathbf{c}}{\boldsymbol{\Phi}} = \frac{2\pi rf}{(n)\Phi} = \frac{2\pi rf}{1.\Phi} = \frac{2\pi.1{,}616199.10^{-35}.2{,}93949410^{42}}{1{,}6180339} = 1{,}84456315.10^{8}$

t/m2 = 1,84456315.10^{11} Kg / m2 , and is the Information-way for the **In-Planck-length** .
Stress σ_{PL} = **n**.1,84456315.10^{11} Kg/m2 , 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 Gravitational constant G and a cave , **r** , then $\rightarrow \sigma = \frac{G}{4\pi r^2} = \frac{G}{\pi(2r)^2} = \frac{G}{\pi s^2}$, or a vector **s** . Above relation means that Force **G** needs a Vector-surface $\pi.s^2$ to be spread as Stress $\boldsymbol{\sigma}$, which is the case of Constant-light-velocity , **c ,** as the ***first Surface*** .

b.. The case of a vector ,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. $G \equiv \sigma.\Phi^3 \equiv \Phi^2.[\{\sigma\ \Phi\}] \equiv [\frac{2B}{\pi r^3}] \equiv 2\pi f_P\, r \equiv w\, r \equiv \bar{v} \equiv m\, a \equiv m\, g = \bar{c} = \frac{2.B}{\pi r^3}] = g\, .k_E$ from where issues $\Phi^2.[\, m\, g\,] = g\, .k_E$, or $m = \frac{k_E}{\Phi^2}$ an expression of mass **m** and $\mathbf{k_E}$.

c.. Since Stresses follow equation $\boldsymbol{\sigma} = \frac{F}{A} = \frac{2\pi rf}{\Phi}$, conclusively **Forces and Areas** are every-where and are related to any-cave **r** , through **f** , which is the mean of **every-Information**.

d.. Since the Nutation-Frequency $f_N = \frac{r_e.Q_e}{2\pi.J_3 w} = 2,8398447.\ 10^{10}\ s^{-1}$, then $f_N = \frac{r^2_e.\Phi.Q_e}{2\pi.J_3 G}$ i.e. the effect of Gravity issues in caves and is related to G as Nutation - Force .
The Golden-Ratio-frequency $f_P = \frac{\sigma.r}{\pi.\bar{B}} = \frac{n\sigma.\Phi}{2\pi r}$, 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** , $\mathbf{r} \neq L_P$, faces-to the Impedance $\mathbf{Z_c}$, from Velocity $\bar{\mathbf{c}}$, and Becomes the minimum-Energy-cave in L_P , and Equal to $\mathbf{E \equiv r\, Z_c\, \bar{c}}$
$r_H = \frac{h}{c.Z_c} = \frac{[6,62606957.10^{-34}]}{2,99798\ .10^8\ 1,0460975.10^{-31}} = \mathbf{2,1127839.10^{-11}}$ m , which is the Hydrogen cave.
Energy in this cave is $E = \mathbf{k} = \frac{T^2}{a^3} = \frac{[3,04513.10^{-16}]^2}{[2,1145016.10^{-11}]^3} = \frac{9,2728109.10^{-32}}{9\ ,4541768.10^{-33}} = \mathbf{9,\ 808238}\ \frac{s^2}{m^3} = \frac{N}{Kg}$

f.. Atoms Bonding happens on , **Slit-Vectors { Bracket-Orbit-Hook }** which occupy the **Unit-Energy-Space frequency** in order that the Electron-Hook $\ominus$, to Joint with the Bracket-Proton $\oplus$. For this to happen is needed a common equation for the *different* [**Bracket-Orbit-Hook ≡ 2r] as** $\rightarrow$ $\ddot{r} + w^2 r = 0$ where $w = 2\pi f_1$ as above frequency , $2\, r = \Delta$ is the amplitude of an vibration , and then $T = 2\pi\sqrt{\frac{m}{k}}$, **Natural** $\mathbf{f_1} = T^{-1} = \frac{1}{2\pi}\sqrt{\frac{k}{m}}$
$= \frac{1}{2\pi}\sqrt{\frac{g}{\Delta}}$ in cave $2r = \Delta = \frac{g}{k}$, i.e. **Hook is an Energy Loop**.

g.. From Gravity-Force $DE \equiv [\bar{c}.\nabla i] \equiv \bar{c}\,[\nabla i] \equiv$ The Travelling-Energy-cave , $\bar{\mathbf{c}}$, 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 Atom-Range-action follows that ofElectric-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 , where constant $C = \frac{\pi ab}{T} = \frac{\pi a}{T}[\frac{1}{r^2}] = \frac{\pi a}{T\, r^2}$. From relation $r = 2a.\cos\varphi$ is , $\cos\varphi = \frac{r}{2a}$, $\frac{1}{r} = \frac{1}{2a\cos\varphi}$ and $\frac{d1/r}{d\varphi} = \frac{1}{r}\tan\varphi$, and from Central-motion-Energy velocity $\rightarrow v^2 = 4C^2.[\frac{e^2\ \sin^2\varphi}{p} + \frac{1}{r^2}] =$
$v^2 = 4C^2.[\tan^2\varphi + 1] = \frac{4C^2}{r^2}\ \frac{1}{\cos^2\varphi} = \frac{16C^2a^2}{r^4}$ and ***the velocity*** $\rightarrow \mathbf{v} = \frac{4Ca}{r^2} = \frac{2\pi f}{r} = \frac{w}{r}$
The Centripetal -acceleration $a_p = \frac{v^2}{r} = -\frac{16C^2a^2}{r^4} \cdot \frac{1}{a} = -[\frac{16\ C^2a}{r^4}]$, and is equal to $\frac{a_p}{\cos\varphi}$, therefore the , ***Centripetal-acceleration*** $\mathbf{a_p} = -\frac{32C^2a^2}{r^5} = -\frac{32\pi a^4[\,1\,]}{T^2 r^4\ [\,r^5\,]}$ and for r = a then $\rightarrow \mathbf{a_p} = -[\frac{32\,\pi}{T^2\ r^5}]$, and the Force of cave $F = -[\frac{32\pi mf^2}{r^5}] = -[\frac{32\pi.S\ f^2}{v\ .\ r^6}]$ 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 $\varphi = 180^{\circ}$ in Photoelasticity . From equation $\boldsymbol{\sigma} = \frac{v \rightarrow c}{\Phi^2}$ 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 is that there is NOT Negative-Mass NOT Space-time , **But** Reaction to velocity-change and Space-Energy. Concerning Gravity-Force DE ≡ $\bar{c}$ [∇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 $V_C = r \,.\, F_C$ and , Spin → S =[$\frac{amc}{\pi}$] =$\bar{B} = \frac{2L}{\bar{w}} = \frac{2L}{2\pi f} = \frac{\pi^2 r^4 . f}{2}$.

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 **DE ≡ $\bar{c}$ [∇i]** . [72]

3.. Electromagnetic-Forces :

Electricity is the motion of the Material-Points , and their relation.

The **Three Elements** ≡ Digits of Material-Geometry are →{⊕ , [⊕↔⊖] , ⊖} ≡ [+, 0 , -]←

The **Permutation** , *arrangement* , of the Two-Elements $P_1^2 = \mathbf{2}$, i.e. are → [⊕,⊖] - [⊖,⊕]←

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 → $P_1^3 \,.\, P_1^3 = 6 \times 6 = 36$ 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 [⊕ , ⊖] the Growth is $10^{[10]^2} = 10^{20}$ Positions ≡ Distances ≡ r , and since issues $10^{-x} = \frac{1}{10^x}$ then $\mathbf{b} = 36.10^{-20}$, and → $\bar{\mathbf{v}} = \frac{F\Phi}{A} = [\frac{G\Phi}{A}] = [\frac{6{,}673692.10^{-11}.1{,}6180339887}{36.10^{-20}.}] = 2.9995163.10^8$ m/s

i.e. **Ubiquity of Material-Geometry in Electromagnetism** is ,$\bar{\mathbf{v}}$, Instantly-Everywhere .

For Charges issues **Coulomb law** of Forces between Charges as → $\mathbf{F_c = C \frac{q_1 . q_2}{r^2}}$, and the United Newton-Coulomb **Electro-Mechanical** Equation , $\mathbf{q\,\bar{B}_L = 2\pi\, m\, f}$, for masses as the Resonance frequency $\mathbf{f_R = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}}}$ between Charges and masses .The System M_T=masses Q_T = Charges creates a constant Magnetic-field with **Magnetic-field-Strength** $\bar{B}_F = |\frac{2\pi . M_T}{Q_T}|f$

Energy in cave is $E_K = \frac{k}{r} + \frac{L^2}{2m\,r^2} = \frac{k}{r} + \frac{L^2}{2(\frac{S}{r^2.w})\,r^2} = \frac{\pi}{r} + \{\frac{Sw}{2} = \frac{cS}{2r}\} = \frac{\pi}{r} + \frac{cS}{2r}$, related to Spin ,cave.

Dual-Photon $\bar{\mathbf{v}} = \bar{\mathbf{c}}.[\boxed{\bar{f}_n} + \mathbf{f_n}]$, is **Particle + Wave ≡ Energy** moving with light-velocity and its Duality exists in frequency . The Material-Points travel with velocities $\mathbf{n}.\bar{\mathbf{c}}$, and are as $\bar{\mathbf{v}}_\mathbf{m} = n.\bar{c}.\{\boxed{\bar{f}_n} + f_n\} \equiv [\frac{G}{\Phi^3 L_P}]\{\boxed{\bar{f}_n} + f_n\}$, where $\boxed{\bar{f}_n}$ is the Stationary Storage and [f_n] Travels as an Propagating Electromagnetic-Radiation where motion ≡ Energy ≡ Wave as Electric-Force and is altered to the , **Space ≡ Magnetic force** as $\bar{\mathbf{E}} = \bar{\mathbf{B}}$ c .

The Propagating-Photon follows the Dual-Property $\bar{\mathbf{v}} = \lambda_n . f_n = \bar{c}\,.[\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}]$.

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

Remarks : On the **Duality-Photon** $\mathbf{\{\bar{c}\,.\,\boxed{\bar{f}_n} + \bar{c}\,.\,f_n\}}$ ≡ → Particle + Wave ←

a.. From equations $f = \frac{\sigma_1 \Phi}{2\pi r}$ and $\sigma_1 \,.\, [1 \pm (\sqrt{5})] / 2 = \sigma.\Phi$, then **Frequency** $\mathbf{f_P}$ of Photon is Independent of the Amplitude [$\varepsilon E^2 + \mu B^2$] 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. the ***Conversion of the Light-Energy into Chemical-Energy*** .

c.. **Photon** in the Microcosm of Hydrogen - Cave can-**Give** such **Potential-Energy as Resonance-Energy–Frequency** $\mathbf{f_R}$ **,** as that Energy in **[Bracket – Orbit - Hook] which Joints the Atoms to Produce** the **Molecules** .

d.. **Electric-Force** ***is the Dominant where Particles are responding to the*** **Constructive [⊕→(+)←⊕]** or **[⊖→(+)←⊖] ,** and to **Destructive [⊕→(-)→⊖] Interference as** , **Constructive** _ $[\oplus \to \oplus = \oplus\oplus] \equiv CI^{+,+}_{=+1} \equiv \mathbf{W^+}$,,,, $[\ominus \to \ominus = \ominus\ominus] \equiv \mathbf{CI}^{-,-}_{=0\,-} \equiv \mathbf{W^-}$,

Interference → $[\oplus \to = \oplus] \equiv CI^{+\to}_{=+n} \equiv \mathbf{W^{++}}$ ….3-Types of **CI**-Forces .

Destructive _ $[\oplus \to \ominus = 0_+] \equiv DI^{+,-}_{=0+} \equiv \mathbf{Z^+}$, $[\oplus \to \ominus = 0] \equiv DI^{+,-}_{=0} \equiv \mathbf{Z^o}$,

Interference → $[\oplus \to \ominus = 0\,\_] \equiv DI^{+,-}_{=0\,-} \equiv \mathbf{Z^-}$ .....3-Types of **DI**-Forces .

With the above Mould are Originated all Types of Forces , Strong and Weak.

From equality $G \equiv \boldsymbol{\sigma}.\Phi^3$, is seen the Quantum-Chromodynamics , *dependent on stress* $\boldsymbol{\sigma}$, and Harmonic-ratio Φ , while the Quantum Electrodynamics Origin on exchange forces .

In each wave of , **f** frequency and Force $\mathbf{F} = -\left[\frac{32\pi mf^2}{r^5}\right]$ corresponds a stress $\boldsymbol{\sigma} = \frac{F}{A} = \frac{2\pi rf}{\Phi}$,

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 $\mathbf{F_c = C}\ \frac{q_1.q_2}{r^2}$, while the ***Voltage*** is $\mathbf{V_r = C}\ \frac{q_1.q_2}{r}$ of cave , r , and it is

$\rightarrow \mathbf{V_r = F_c . r} \leftarrow$ ..(v) i.e. when Two Particles are in a cave **r** , where $-\infty < r < 0$ then ***Exists an Interaction between the two Particles*** and this is the **Stress** and the **Force** as above and are the < color –forces >.

4.. Strong-Forces :

a).Strong forces are created on, **Markos-STPL** ,in Pascal`s and Desargues`s Six-Point-Line. **BOSONS** are formed **Axially** to Common-circle in Sub-Space A_E , B_E , C_E , such for Space A , B , C , as for Anti-Space K_A , K_B , K_C ,and thus acquire their Spin and ***Instead of a Charge*** an **Voltage-Force ≡ Motion-in-Magnet ≡ Material-Point** from their Conductors, $\overleftrightarrow{AP_A}$, $\overleftrightarrow{AD_A}$ **,** when the $\oplus$ Breakage **Attacks** =≫ to , ∅ **Zero**-Charge , as $\oplus$ =≫∅ =≫ $\mathbf{Q_+} = \frac{g.S}{2\pi r^2}$ and are Launched with $\mathbf{Q}_{\overrightarrow{AK_A}}$, $\mathbf{Q}_{\overrightarrow{A_E K_A}}$ Quantities at $\mathbf{P_A}$, $\mathbf{D_A}$ Points of the STPL line with the Linear-relation $\bar{B}_F = \frac{\bar{v}.\bar{S}}{q.r^2}$ or $q.\bar{B}_F = \frac{\bar{v}.\bar{S}}{r^2}$, as below .

From $\bar{B}_F = \frac{m.2\pi}{q}.f = [\frac{2\pi.m}{Q_+}].f$, so , $\mathbf{F} = \bar{q}\ \bar{v}x[\frac{2\pi.m}{Q_+}f] = 2\pi.\bar{q}\bar{v}.[\frac{m}{mg}].f \equiv \frac{\bar{v}.\mathbf{S}}{\mathbf{r^2}}$ or $\rightarrow \frac{\mathbf{2\pi\bar{q}}}{\mathbf{g}}\ \mathbf{f} = \frac{\mathbf{v.S}}{\mathbf{r^2}}$

and **M-Force** $\bar{\mathbf{B}} = \frac{\bar{v}.\bar{S}}{q.r^2}$ or $\rightarrow \bar{\mathbf{B}} = \frac{3.10^8\ 5{,}691952.10^{-34}}{1{,}602.10^{-19}[10^{-19}]^2} = 1{,}065127.10^{32}$T , half Plank-M-Field

Nutation-Force $\mathbf{F_N} = q\ c\ B = 1{,}602.10^{-19}.[2{,}9978.10^8].1{,}065.10^{32} \equiv \mathbf{5{,}1146.10^{21}}$ N .

Strong - Forces are created on , **Markos-STPL** ,in Pascal`s and Desargues`s Six-Point-Line **.** From Magnetic field $\bar{B}_F = \frac{m.2\pi}{Q_+}$ f ,and Centripetal-Coulomb force $\mathbf{F} = \bar{q}\bar{v}.\bar{B}_F = \bar{q}\bar{v}\ [\frac{2\pi.m}{Q_+}f] = 2\pi.\bar{q}\bar{v}[\frac{m}{mg}].f \equiv \frac{mv^2}{r} \equiv \frac{S.v}{r^2}$, since Spin S = r m $\bar{v}$ and $\rightarrow 2\pi.\bar{q}\bar{v}.[\frac{f}{g}] = \frac{\bar{v}.\mathbf{S}}{\mathbf{r^2}} \leftarrow$ or $\frac{\mathbf{2\pi\bar{q}}}{\mathbf{g}}\ r\ f = \frac{\mathbf{S}}{\mathbf{r}}$, $\frac{\bar{q}(\boldsymbol{\sigma\Phi})}{\mathbf{g}} = \frac{\mathbf{S}}{\mathbf{r}}$ and then becomes $\mathbf{r}\ .\boldsymbol{\sigma}\ .\ \bar{\mathbf{q}}_{\mathbf{Cave}} = \frac{\mathbf{S.g}}{\boldsymbol{\Phi}}$, since frequency $f = \frac{\sigma.\Phi}{2\pi r}$, the angular Momentum-Vector $\bar{\mathbf{B}} = \pi^2.r^4.f \equiv$ **Spin** $\pm\ \bar{\mathbf{S}} \equiv \frac{\pi r^3\sigma}{2}[1+\sqrt{5}] \equiv \pi r^3.\sigma\Phi \equiv [\frac{\mathbf{h}}{\mathbf{2\pi}}] \equiv \frac{2L}{2\pi f}$, or

$$\rightarrow \quad \bar{\mathbf{q}}_{\mathbf{Cave}} = \frac{\bar{S}.g}{\boldsymbol{\sigma}\ .\ r.\Phi} \equiv \frac{\bar{S}.g}{\bar{v}\ .\ r} \leftarrow \ldots..(q)$$

Above equation (q) relates **Charge** $\bar{\mathbf{q}}$, (Electricity) with caves r , and for light velocities then $\bar{\mathbf{q}}_{\mathbf{Cave}} = \frac{\pi r^2 g}{2}$, meaning that Charges are related to **r** Caves with light velocities **c** . From Spin $\bar{\mathbf{q}}_{\mathbf{Cave}} = \frac{\bar{S}.g}{\boldsymbol{\sigma}\ .\ r.\Phi}$ or $\rightarrow \bar{\mathbf{q}}_{\mathbf{Cave}} \equiv \frac{\bar{S}.g}{\bar{v}\ .\ r} \leftarrow \ldots(q)$, i.e. the Work Produced by the ***Spin in Caves*** is transformed into Stresses , $\boldsymbol{\sigma}$, and Charges , $\bar{\mathbf{q}}$, meaning the ***Electromagnetism*** .

Above relates the Inside existing Spin **S** of cave , **r** , with force , **F** , which creates Charge , $\bar{\mathbf{q}}$. These Charges , $\pm\ \bar{\mathbf{q}}$,{following Spin 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** , $\pm\ \bar{\mathbf{q}}$, independently of **Charge-Type** and so is the **Origination of the Six-Forces** , i.e. In the same cave , **r** , Charge $\bar{\mathbf{Q}}_+$, creates the Magnetic field $\bar{\mathbf{B}}_\mathbf{F}$, following Coulomb law and in where the Gravity , **g ,** acts on Charge mass $\mathbf{m}_+$ and creates the Nutation frequency $\mathbf{f_N}$, and the Inertial-Force **F** . This Useful-Property allows MRI-**Photos** from the Surface of the caves . The Hydrogen cave $L_H = \mathbf{r} = \frac{\mathbf{h}}{\mathbf{c.Z_c}} = 2{,}1127839.10^{-11}$ m is the min-cave in Planck`s-cave with the max-Energy **h** . The cave with [**Anti-Space + Space-Positions**] is $0{,}707106781.10^{-20}$ m and is the **Border-line** between the , **Weak and the Strong Forces** , and this because in cave exist the maximum number of Space-Positions . By placing the cave r =10^{-21} then the above cave , **r** , in Nucleus-Cave gives charge $\mathbf{Q_+} \approx \mathbf{0}$ and from Spin , $\bar{\mathbf{q}}_{\mathbf{W-S}} = \frac{g.\bar{S}}{v.r} = \frac{9{,}8076754.[5{,}691952.10^{-34}]}{2{,}9979.10^8.[10^{-21}]} = 18{,}62130710^{-21}$J/$1{,}602.10^{-19}$eV= $0{,}11622.10^{o}$ eV or it is the E-**Border-line** between the S-W Forces as $\rightarrow\ \bar{\mathbf{q}}_{\mathbf{Weak-Strong}} \equiv \mathbf{0{,}11622\ eV} \leftarrow$ **All Particles and Forces End in STPL , Pascal`s , $\mathbf{P_A}$ , and Desargues`s Points , $\mathbf{D_A}$. $\mathbf{AK_C}$,** Creating the , **+ Force** $\mathbf{G^+} = \oplus \rightarrow \varnothing$, and $\mathbf{AK_B} = \oplus \leftarrow \varnothing$, Creating the , **– Force** $\mathbf{G^-}$**.** It was shown that Newton-Force in a **Neutrino-cave** 10^{-18} m exhibits **five attractions** of different Strengths. These attractions are from the Strong forces as $\{\oplus \leftrightarrow \oplus\}$, $\{\ominus \leftrightarrow \ominus\}$.

For 3-Combinations → [s s s] ≡ $[-\frac{1}{3}-\frac{1}{3}-\frac{1}{3}+W^{-}] \equiv \left(-2/3\ |\mathbf{W}^{-[-1/3]}\mathbf{W}^{-}\right) \equiv (-1\ |W^{--})$ and because of the 3-Negative (-) elements exists Strong -**Repulsion** , But Final-Interaction becomes as ,**Attraction** , and this because of the **NEW Equilibrium** on the vertices of the Equilateral triangle vertices-formation , called **the New-Positions** , of the Space and Anti-Space , forming the Strong Forces $\{\ominus\leftrightarrow\oplus\leftrightarrow\ominus\} \equiv \begin{matrix}+ & - & +\\ - & + & -\end{matrix}$ which differ $10^{1\approx5}$ of Strength , Red , Blue-color to Violet-color , as in **Quantum Chromodynamics** , [91] .

For 3-Combinations → $[\bar{s}\ \bar{s}\ \bar{s}] \equiv [\frac{1}{3}+\frac{1}{3}+\frac{1}{3}+W^{+}] \equiv \left(2/3\ |\mathbf{W}^{+[+1/3]}\mathbf{W}^{+}\right) \equiv (+1\ |W^{++})$ and because of the 3-Positive (+) Elements exists Strong -**Repulsion ,** But Final-Interaction becomes as **Attraction** , and this because of the **NEW Equilibrium** on the vertices of the Equilateral triangle Vertices-Formation , called **the New-Positions** , of the Space and Anti-Space , forming the Strong-Forces $\{\oplus\leftrightarrow\ominus\leftrightarrow\oplus\} \equiv \begin{matrix}- & + & -\\ + & - & +\end{matrix}$ which differ $10^{1\approx5}$ of Strength , Violet-color to Blue, Red-color , as in **Quantum Chromodynamics** , [91].

i.e.. as Photoelasticity describes the ***Changes in Stresses and Strain in a material*** ,so QCD Determines the **Stresses and Strain** { Energy - Space } , in **Cosmic-Caves** Subjected to Coulomb-Forces .This **Light-Wave** is seen as Screen of , ***Fringe-Pattern*** ,Tension-lines.

5.. Weak-Forces :

1.. Weak-Forces are created on , **Markos-STPL** , in Pascal`s and Desargues`s Six-line-Points .

2..The ⊕ Breakage being alternative at Space-Points **A , B , C** → **Attacks** to the ⊖ **Charges** at Anti-Space-Points $\mathbf{K_A}$,$\mathbf{K_B}$,$\mathbf{K_C}$, and forms **Leptons** { $\mathbf{e^-}$, $\boldsymbol{\mu^+}$, $\boldsymbol{\tau^+}$, $\boldsymbol{\nu_e}$, $\boldsymbol{\nu_\mu}$, $\boldsymbol{\nu_\tau}$ } , and **Quarks** {**d , s , b , u , c , t** } , **ON STPL** Points $\mathbf{P_A}$, $\mathbf{P_B}$, $\mathbf{P_C}$--$\mathbf{D_A}$, $\mathbf{D_B}$, $\mathbf{D_C}$ respectively.

3..Because the ⊕ Breakage **Attacks** =≫to ⊖ **Charge** thus Anti-Particles are Generated only from the Opposite-motion , ***Opposite-direction*** , in their Conductors . D , P → I ← P , D

4.. From [91] The Geometry of STPL line allows Six Quantities on the three Loads as The **Artificial 3-Phase-Star**-Circuit and The-**Physical 6-Phase-Delta**-Circuit for $\mathbf{Q}_{\overrightarrow{AK_A}}$, and $\mathbf{Q}_{\overrightarrow{A_E K_A}}$, Elementary -Particles are all-launched at $\mathbf{P_A}$ and $\mathbf{D_A}$ Points of STPL .

5.. Primary Particles occupying mass **m** , exert Gravitational Attraction on each other .

The Work Produced by the Spin S , increases the Charge $\bar{q}_{Cave}$ as → $\frac{\mathbf{S(g.c)}}{\mathbf{\Phi}} \equiv \mathbf{r}.\boldsymbol{\sigma}.\bar{\mathbf{q}}_{\mathbf{Cave}}$

For the **Repulsion-Strong**-Forces $[\oplus \rightarrow = \oplus] \equiv CI^{+\rightarrow}_{=+n} \equiv \mathbf{W^{++}}$, and because in each Phase $\varphi = 180^{o}$ the Energy increases , is Presented < **color force** > as in Photoelasticity and thus exert **Attraction** via the Strong –Nuclear-Force which is the **Stress** → $\boldsymbol{\sigma} \equiv G/\Phi^3$.

For the case of Two Protons in Hydrogen-cave , these become Bound , forming the Helium Nucleus and because the Dynamic-Strip-Polygon doesn`t close , [p + p =⟶ ⟶] a Neutron

is also needed to keep the Helium Nucleus Stable [p→∅←p] . A wide analysis in [91-92]

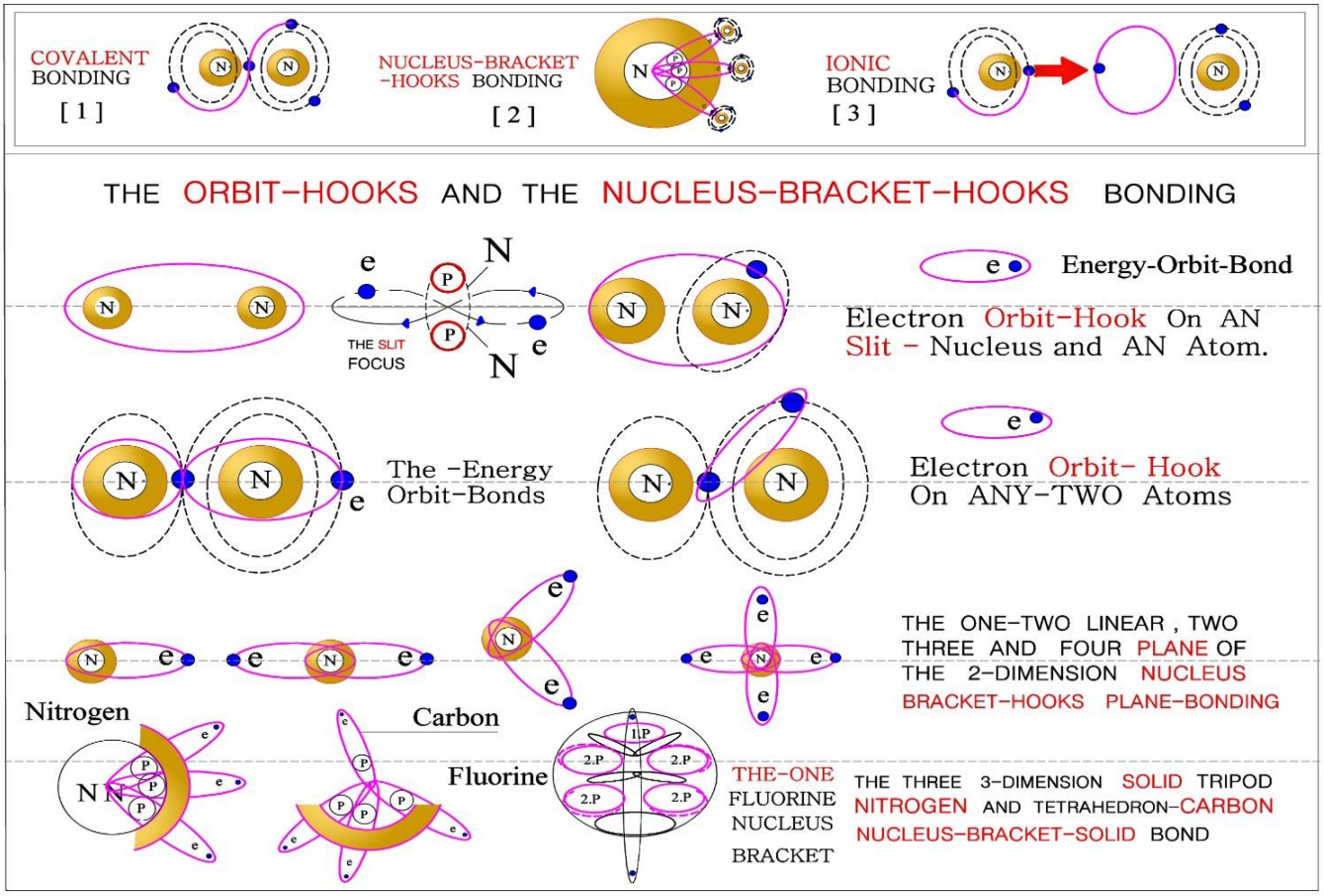


Figure – 30 - : The Types of Atoms - Bonding .

I... THE ATOMS - BONDING **:**

1i.. Energy and Motion in General :

Motion in Mechanics is the equation of velocity → $\bar{v} = \frac{ds}{dt}$ = constant ,from a Point A to Point B , meaning that the Change of **ds** = d(AB) , in time is constant , or analogous to an index , **a** , as equation $\bar{v} = \frac{ds}{dt} = a\,s$, or $\frac{ds}{s} = a\,dt$ …(1) . By Integration then → $\ln(\frac{ds}{C}) = a\,t$, where C = the constant of Integration , and (1) becomes , $\frac{s}{C} = e^{at}$, or $s = C\,e^{at}$ ….(2)

For s = 0 , equation (2) is at the beginning of motion and → $C\,e^{at} = 0$, or for $t = -\infty$ **i.e.**

Motion does Not Exist , and Existed **Only when it was in the deep Past , which is Invalid .**

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 $W = \int_A^B P.ds = 0$ or $[ds.(P_A+P_B) = 0]$, i.e. for any monad ds > 0 Impulse $P = (P_A+P_B) = 0$ and $[ds.(P_A+P_B) = 0]$, Therefore , Each Unit AB = ds > 0 , [⊕↔⊖] , exists by this Inner Impulse (P) where $P_A + P_B = 0$, or $P_A \equiv -P_B$

Applying this logic on **Two caves** either Ellipse or Circular , at the Common Point **B** , [F-31] then to exist Orbital-Bonding (AB)↔(BC) at common Point , B , of the two Electron-Orbits 1,2 is ***Needed the Balancing of*** the ***Spaces*** (AB),(BC) , and ***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 point **B** where 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 is tangential to the F_c , F_W ,Energy-Plane**.** By this way ***Energy-Velocity-Vector*** $\bar{v}_{e1}$ of (AB) Electron-cave **Passes** to Space-cave (BC) as ***Centripetal-Force -Vector*** $\bar{F}_C$, where issues $\bar{v}_{e+r1} + \bar{v}_{e+r2} = 0$

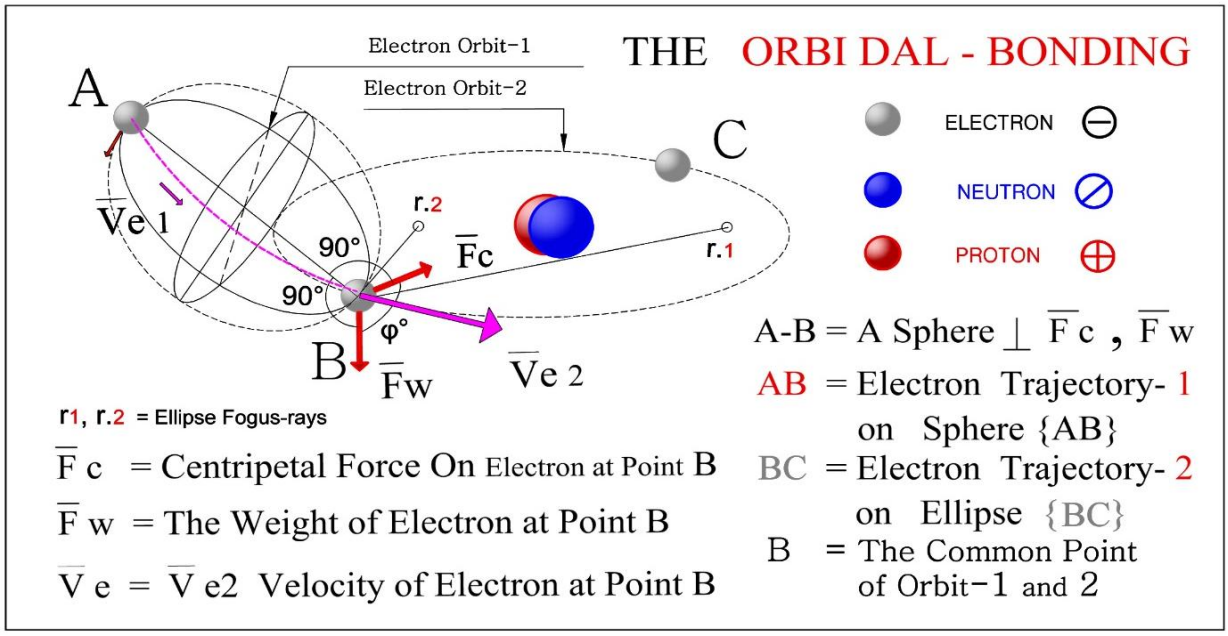


Figure – 31 - : The Balancing Orbital-Bonding between Orbit-1→ $\bar{\mathbf{v}}_{\mathbf{e1}}$,and Orbit-2 → $\bar{\mathbf{v}}_{\mathbf{e2}}$: From all trajectories on ***Sphere*** [AB , R] , the ***Transverse-Plane*** at common Point B , which is Perpendicular to Vector $\bar{\mathbf{v}}_{\mathbf{e2}}$ and in which Plane lies the Resultance of the Centripetal-$\mathbf{F_C}$ and Weight -$\mathbf{F_W}$ Vector , ***it is the Balancing of Space and Motion*** , i.e. → **The Path for Bonding** . The ***Transverse-Plane*** forms an angle , **φ** , to Plane $B_{r\,1}$, $B_{r\,2}$, of the Centripetal -$\mathbf{F_C}$.

Since Transverse-Plane is Perpendicular to $\bar{\mathbf{v}}_{\mathbf{e2}}$ then the Component-Velocities are zero and $\bar{\mathbf{v}}_{\mathbf{e+r1}} + \bar{\mathbf{v}}_{\mathbf{e+r2}} = 0$ lying on $\bar{v}_{B\,r1}$, $\bar{v}_{B\,r2}$ Vectors or the ***Stability of Velocities*** **.**

2i.. 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 the Centripetal Force at Point B is Perpendicular to Tangential-Plane [$\bar{\mathbf{v}}_{\mathbf{e}}$, $\mathbf{F`_W}$] , differently to Proceeded-Plane.

Because in any circular motion , the Centripetal Force-Vector is , $\mathbf{F_C} = \frac{mv^2}{r}$, and weight Vector $\mathbf{F`_W} = m\,g$, then reaction on trajectory is Perpendicular to their Plane , therefore the inclination of this Plane for equilibrium is $\tan\theta = \mathbf{F_C / F_W} = \frac{v^2}{r\,g} = \frac{[2{,}9979.10^{8}]^2}{2{,}1127839.10^{-11}.9{,}8077} =$ $0{,}4337236.\,10^{27} = 4{,}337236.\,10^{26}$ and $\theta \cong 90^{\circ}$.

In case where this **Tangential-Plane** [$\bar{\mathbf{v}}_{\mathbf{e1}}$, $\mathbf{F`_W}$] of 1-Space is common to another 2-Space as [$\bar{\mathbf{v}}_{\mathbf{e2}}$ , $\mathbf{F`_W}$] then exists a ***Balancing*** between the two Spaces 1 , 2 , and velocity vector $\bar{\mathbf{v}}_{\mathbf{e2}}$ bisects the Outer angle of Ellipse r_1 - r_2 rays . or is Perpendicular to the circle-radius , r . Because the Projections of ***Velocity-Vector*** $\bar{\mathbf{v}}_{\mathbf{e1}}$, $\bar{\mathbf{v}}_{\mathbf{e2}}$ are equal then $\bar{\mathbf{v}}_{\mathbf{e+r1}} = -\ \bar{\mathbf{v}}_{\mathbf{e+r2}}$ and ***Energy-Velocity-Vector*** $\bar{\mathbf{v}}_{\mathbf{e1}}$ of Space-1 **Passes** to Space-2 as ***Centripetal- Force -Vector*** $\bar{\mathbf{F}}_{\mathbf{C}}$, The Total-Energy for Unit-mass in caves is → $E = K_E + P_E = (½).1.\,\dot{x}^2 + U(x) = \text{constant}$ .The Ordinate of the Phase-Plane is given by Planar equation , $\bar{\mathbf{v}}_{\mathbf{e}} \equiv \dot{x} = \pm\sqrt{2[E - U(x)]}$ and for Electron velocity $\dot{x} = 0$, *it is the moment where Electron is quitting* Orbit-1, then 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 Hydrogen-cave .

3i.. The Equilibrium of Orbital Bonding :

In Figure-31- , the Material-Point (Electron) moves under the action of , $\bar{\mathbf{F}}_{\mathbf{e}}(X , Y , Z)$ force *Magnetic field*, On ***Transverse-Plane*** , f(x,y,z) ,which forms an angle ,**θ**, with Plane $B_{r\,1}$, $B_{r\,2}$. **To Show the System`s-Balancing-Positions** when , δx , δy , δz , are the Possible-motions . The equilibrium equations for the Force acting on the Plane are ,

$$\bar{\mathbf{F}}_{\mathbf{e}} = X\,\delta x + Y\,\delta y + Z\,\delta z = 0 , \qquad \text{…..(a)}$$

$$\frac{\partial f}{\partial x}\delta x + \frac{\partial f}{\partial y}\delta y + \frac{\partial f}{\partial z}\delta z = 0 \qquad \text{…..(b)}$$

By multiplication of (b) with 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 ,

$$X + \lambda \frac{\partial f}{\partial x} = 0 \quad , \quad Y + \lambda \frac{\partial f}{\partial y} = 0 \quad , \quad Z + \lambda \frac{\partial f}{\partial z} = 0 \, , \qquad .....(c)$$

The Reaction-Force $\bar{\mathbf{F}}_{\mathbf{R}} = [\, \lambda \frac{\partial f}{\partial x} , \ \lambda \frac{\partial f}{\partial y} \ , \ \lambda \frac{\partial f}{\partial z} \,]$ is the Equilibrium to $\bar{\mathbf{F}}_{\mathbf{e}}(X , Y , Z)$ force which direction is Perpendicular to ***Transverse-Plane*** , f(x,y,z) …. oεδ, as before . $\theta \cong 90^{\circ}$ Stress **σ** , occupies Minimum and Maximum because is related to frequency and velocity as $f_{ph} = [\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}] \equiv \frac{\sigma + \sigma\Phi}{2\pi r} = \frac{\sigma[1+\Phi]}{2\pi r} = \frac{\sigma[\Phi]^{2}}{2\pi r}$, or $\boldsymbol{\sigma} \equiv \frac{\mathbf{f_{ph}.2\pi.r}}{\boldsymbol{\Phi}^{2}} \equiv \frac{\mathbf{w.r}}{\boldsymbol{\Phi}^{2}} \equiv \frac{\mathbf{v}}{\boldsymbol{\Phi}^{2}} \equiv \bar{\mathbf{c}} \frac{\mathbf{1}}{\boldsymbol{\Phi}^{2}}$, 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 $G \equiv \sigma.\Phi^{3} \equiv \Phi^{2}.[\{\sigma\, \Phi\}] \equiv [\frac{2B}{\pi r^{3}}] \equiv 2\pi f_P\, r \equiv w\, r \equiv \bar{v} \equiv m\, a = m\, g = \bar{c}\ ]$ then Stress $\bar{\boldsymbol{\sigma}} \equiv \frac{\bar{F}}{A} \equiv \{\, \boldsymbol{\sigma}\, \Phi \,\} \equiv [\frac{\mathbf{2B}}{\pi r^{3}}] \equiv 2\pi.\mathbf{f_P}\, r \equiv w\, \mathbf{r} \equiv \bar{\mathbf{v}} \equiv m\, \mathbf{a} = m\, \mathbf{g} = \bar{\mathbf{c}}\ ]$ is dependent on Total-Prior. **As soon as $A \equiv \bar{\sigma}\, \Phi \equiv$ {The Space +Anti-Space Positions in Universe },** become **Inadequate** for any **min-Energy-Storage** $\mathbf{A} = e^{-i.(\frac{\pi}{2}).b} = 0$, $207879576.b = 1{,}507.10^{-7}m$, then **Motion ≡ Energy** is first filling **The minimum cave** $r = 1{,}507.10^{-7}m$ and with the Necessary **Velocity Vectors → Burst Into another cave** $a > A = 1{,}507.10^{-7}m$ **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 , Ionic Bond** [58] . From relation $E_{Ph} \equiv \vec{c}.\{\, \boxed{\bar{f}_n} + \mathbf{f_n}\, \}$ is seen the Storages $\vec{c}.\boxed{\bar{f}_n}$, and from $\bar{\mathbf{q}}_{\text{Photon}} \equiv \frac{\vec{\mathbf{c}}.\sigma\Phi}{2\pi r} \equiv \frac{\bar{\mathbf{w}}c.\sigma\Phi}{2\pi}$ the Stresses of Information-Photons .

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 4 Fluoride becomes **C**-$F^{\,3\,D}_{4\,Solid}$ Bond .

4i.. 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 $\frac{d}{dt}(\frac{\partial L}{\partial \dot{q}_1}) - \frac{\partial L}{\partial q_i} = 0$ and Applying Kinetic-energy as $L = (1/2).m[\dot{x}^2 + \dot{y}^2 + \dot{z}^2]$, so that $\frac{\partial L}{\partial q_1} = \frac{\partial L}{\partial q_2} = \frac{\partial L}{\partial q_3} = 0$ 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 Second-Kind are , $m\ddot{x} = Q_x$, $m\ddot{y} = Q_y$, $m\ddot{z} = Q_z$,and if ***Transverse-Plane*** forms an angle , **φ** , to Plane $B_{r\,1}$, $B_{r\,2}$, as → φ = wt ← , then equation of motion becomes , $\frac{d}{dt}(m\dot{r}) - mr.w^2 = 0$, and for the (i) masses issues **The motion of material Point** → $\ddot{\mathbf{r}} = \mathbf{r}.\mathbf{w}^2$ …….(m)

This motion happens on , **Slit-Nucleus { Bracket- Orbit- Hook }** which occupy the **Unit Energy-Space frequency** in order that the ***Electron-Hook*** , ⊖ , to Joint with the ***Proton Bracket*** ⊕ . This to happen is needed the Common equation for the *different* [B-O-H] , where $w = 2\pi f_1$ and as above frequency , $2\, r = \Delta$, is the amplitude of vibration , where is $T = 2\pi^{2}\sqrt{\frac{m}{k}}$, Natural $f_1 = T^{-1} = \frac{1}{2\pi}{}^{2}\sqrt{\frac{k}{m}} = \frac{1}{2\pi}{}^{2}\sqrt{\frac{g}{\Delta}}$, because $k\Delta = mg$ and $2r = \Delta = \frac{g}{k}$ ...(1)

From Orbit-relation $\mathbf{a} = \sqrt[3]{\frac{1}{g.f^{2}}}$, and $f_1 = E / h = 13{,}6\ eV / \mathbf{h}$ = Energy-Space-frequency $= 3{,}28393.10^{15}/s$, ***then*** the Unit-Energy-Hydro-cave $\mathbf{a} = 2{,}1127839.10^{-11}\ m = \mathbf{2r}$ ...1a)

From Kepler Orbit equations $1 = k.f_n{}^{2}.a^{3}$, $4\pi^{2} f^{2}{}_{e}.m_e = k = \pi\, g$, then $m_e = \frac{g}{4\,\pi\, f^{2}{}_{e}}$ .....(2)

Because motions of masses , *in Nucleus* , happen under the same Orbit-circumstances then from ($1f_1$),(2) $\frac{g}{4.\pi^{2}\Delta.} = \frac{g}{4\pi^{1}.m_e}$ and $\Delta = \frac{m_e}{\pi}$, for any mass $m_e = \Delta.\pi$, and $4\pi^{2}f^{2}.m = k$ ...(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 $k = 2\pi.\sqrt{\frac{m}{a^{3}}}$ ....(b)

From $k = \frac{4.\pi^{2}\, m.f^{2}}{1} = \frac{1}{f^{2}\, a^{3}}$ then $f^{4} = \frac{1}{4\pi^{2}m.a^{3}}$ and , $f^{2} = \frac{1}{2\pi}{}^{2}\sqrt{\frac{1}{ma^{3}}}$ or $\mathbf{f} = \sqrt[4]{\frac{1}{\mathbf{4\pi^{2}m.a^{3}}}}$ ….(c)

The Resultance Harmonic-mean mass $\mathbf{M_T}$ is as $\frac{1}{\mathbf{M_T}} = [\, \frac{1}{m_1} + \frac{1}{m_2} + \frac{1}{m_3} + \frac{1}{m_4}\ ]$, because follows ***The Parallel Connections Resistors*** inverse law as in Electricity and it is thus the Best Vector which Fits Harmonic to Galileo Center of masses m_i in molecules .

b.. Example : Water structure H_2O ,

1.. Hydrogen : mass → $m_H = 1{,}67355.10^{-27}$ Kg → 1 Electron

2.. Oxygen : mass → $m_O = 26{,}5663.10^{-27}$ Kg → 8 Protons , 8 Electrons

1.. As in Electricity issues , ***The Parallel Connections Resistors*** $\frac{1}{R_T} = [\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + ..]$

The ***Harmonic-Mean-Mass*** on the Center of the 3 masses is $\frac{1}{m_{2+1}} = [\frac{1}{m_1} + \frac{1}{m_2} + \frac{1}{m_3}]$

$= [\frac{10^{27}}{26{,}566} + \frac{10^{27}}{1{,}67355} + \frac{10^{27}}{1{,}67355}] = \frac{1}{m_{2+1}} = \frac{10^{27}}{0{,}811223}$, or → $m_{3T} = 8{,}112232.10^{-28}$ Kg

2.. From eq.(c) $f_{3T} = \sqrt[4]{\frac{1}{4\pi^2 m\, a^3}} = \sqrt[4]{\frac{1}{4\pi^2 8{,}1122.10^{-28}.9{,}45418.10^{-33}}} = \sqrt[4]{3{,}3027653.10^{56}} =$

$\mathbf{f_{3T}} = 1{,}3480916.10^{14}$ /s , which is the ***Resonance-frequency*** of H_2O Molecules .

3.. From Cave-relation , **a** Cave , is $a = d = \sqrt[3]{\frac{1}{9{,}808.f_{3M}{}^2}} = \sqrt[3]{5{,}6102298.10^{-30}} =$

$\mathbf{a} = 1{,}77688867.10^{-10}$ m , then **Bracket-Hook** $\mathbf{\Delta = 2a = 3{,}5537772.10^{-10}}$ m

i.e.. On Oxygen Slit - Nucleus , (8 - 6 = 2) the **TWO [Bracket-Orbit-Hooks]** ≡ **Δ** ≡ **2a = 3, 5537772.10^{-10}** m , are **Orbit -Vectors and Fixed at Plane angle** > 90º, and are **the Vector`s Negative Electron-edges** , ⊖ , **which are Joint with an Positive Proton** ⊕ . **of the Hydrogen-Nucleus .** The Orbit-Ring **O ↔ O** happens on the

Water - Molecule -Structure as , $[H\oplus]\leftrightarrow\ominus\leftarrow\leftarrow \begin{matrix} P & P & P \\ O & & \end{matrix} \rightarrow\rightarrow\ominus\leftrightarrow[\oplus H] \equiv OH_2$.

Bracket-Orbit-Hook **Δ = 2a** , follow the above Mean-Harmonic-equation (m) of motion . The Above Property of , **Bracket-Hooks** , as Orbits ≡ Rings , denotes the Deep Relation between Material Geometry and that of all Nature , *Physics* .

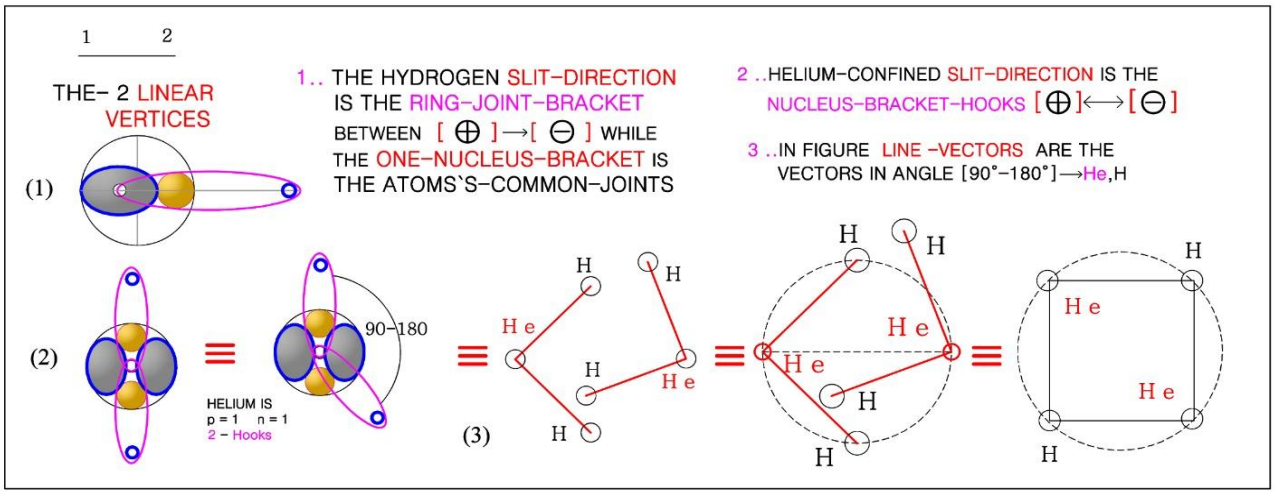


Figure – 32 - : The One **Hydrogen-Nucleus-Slit** , is The First – Nucleus-Bracket-Bond The One **Hydrogen-Orbit** is the **First Proton-Orbit-HOOK** on → **Hydrogen cave** . On **Helium-Atom** → exist **Two Nucleus-Brackets** , on two **Slit -Directions** .The One **Helium-Orbit-Hook** is for ,**Two Proton-Hook-Directions** (90 -180^0) , and so the Two Points-Hooks (H – H) → can Bond from **Square** bonding to any **Rhombus** Shapes . All the Bonding shapes happen in **Plane Trigonal Planar** Geometry as , **He** -$H^{2\,D}_{2\,Line}$. Following the Lewis-Symbols for the Share-Pairs of Electrons and Atoms then for Hydrogen Bonding issues, **H**-$H^{1-\infty D}_{1\,Vector}$, **He**-$H^{2\,D}_{2\,Line}$, **Li**-$H^{2\,D}_{3\,Plane}$, **Be**-$H^{2\,D}_{4\,Plane}$, **Bo**-$H^{3\,D}_{3\,Solid}$, **C**-$H^{3\,D}_{4\,Solid}$,,

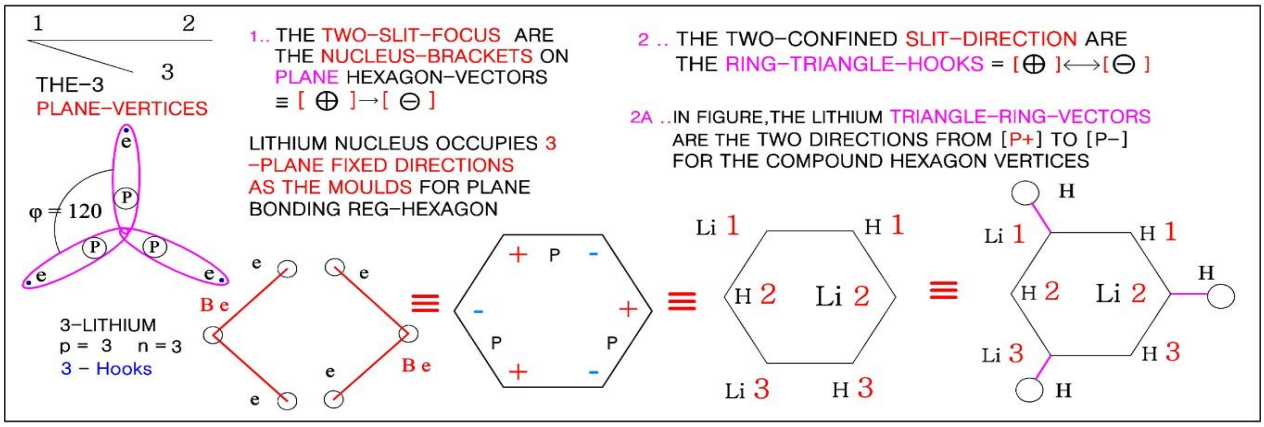


Figure – 33 - : The Three **Lithium -Nucleus-Slits** with angle **120^0** -Plane Directions of the Orbit-Hooks can Bond , *on Plane Directions* , in the Steady –Triangle -Shape which is The **Regular-Hexagon-Plane-Bonding .**

All the Bonding shapes happen in **Plane Polygonal Planar** Geometry from , **Li**-$H^{2\,D}_{3\,Plane}$.

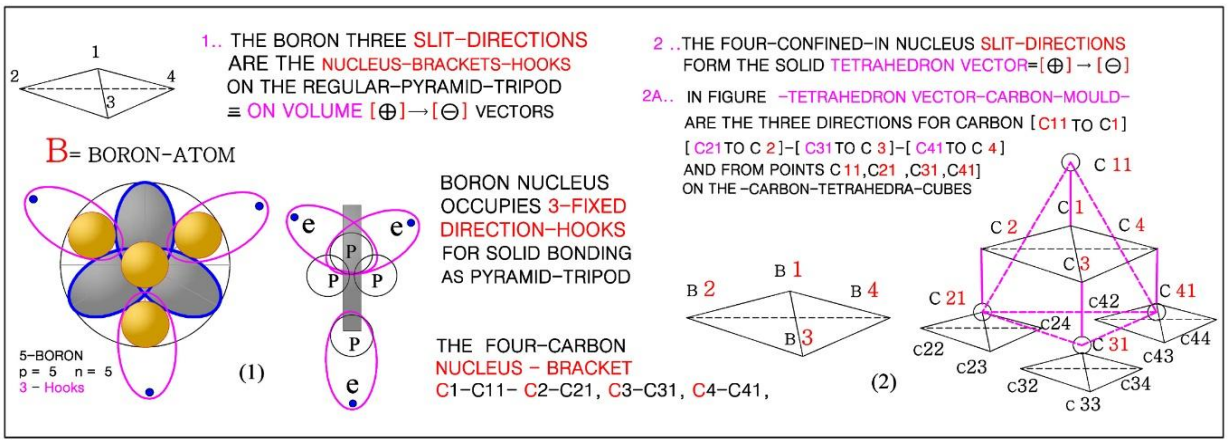
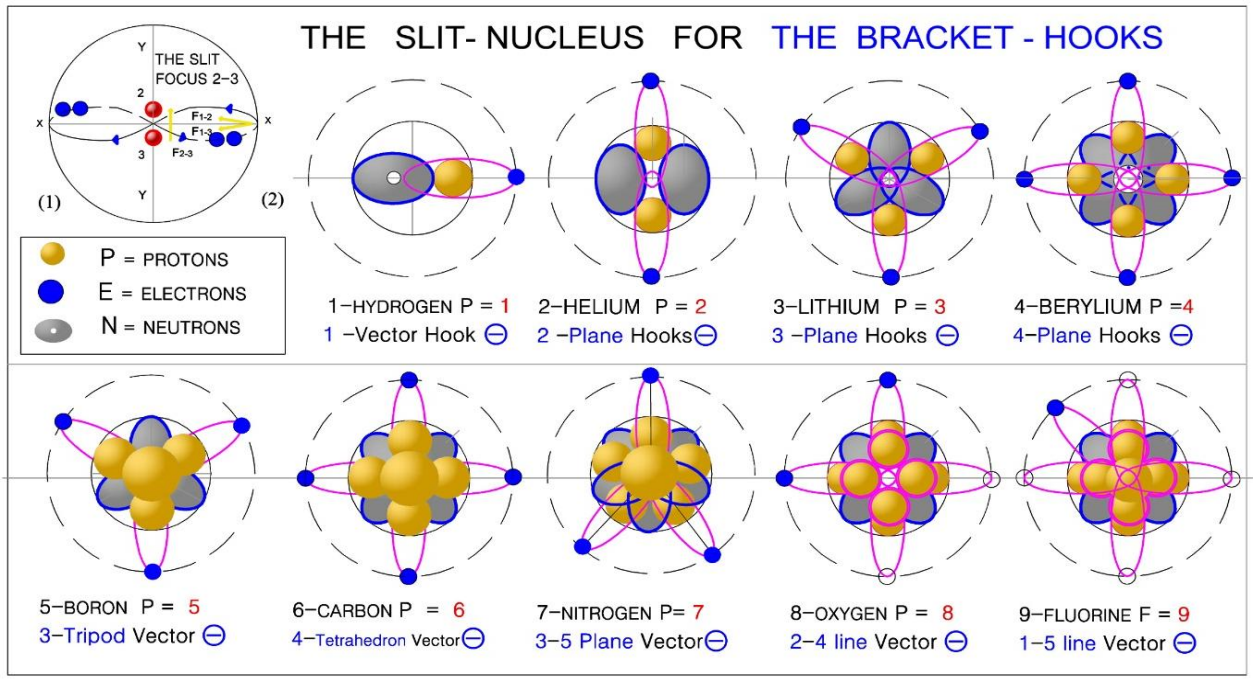


Figure – 34 - : On **The Boron-Atom** with the Three **Nucleus-Fixed-Bracket-Hooks** on a Trigonal Pyramid ***Directions*** issues the Space of three Planes , **Bo**-$H^{3\,D}_{3\,Solid}$.
On The **Carbon-Atom** with the Four Nucleus-Fixed-Bracket-Hooks on the ***Regular Tetrahedral*** C_{11}-C_{21}-C_{31}-C_{41}, issues the Space of four Planes as , **C**-$H^{4\,D}_{4\,Solid}$ Bond.

Remarks :

1.. The **Nucleus Fixed-Brackets-Hooks** occupy the Shape of the Permuted-Positions of the Atom and are the { **Electric-Field–Loops ≡** EF-Loop**} ,** as Vectors , Lines , Planes , Solids Fixed on the Nucleus-Protons .



2.. Brackets On **Nucleus-Slit-Positions** are the → Fixed-**Proton-Electron-Hooks .**

3.. The **Orbit-Hook** is the High-Energy-Vector **Antenna-Electric-Field–Loop≡** EF-Loop .

Figure – 35 - : 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 Carbon-density $C_L = \frac{\text{mass of molas(gm)}}{\text{Density}(\frac{gr}{cm3})\text{Avogadro}-N} = \frac{12\ gr}{2{,}1(gr/cm3)6{,}02214.10^{23}} = 9{,}454184.10^{-24}$ cm³
and $C_L = 2{,}11.10^{-8}$ cm = $2{,}11.10^{-10}$ m = 10.[2,11450164.10^{-11} m] = 10.[Hydrogen-cave]
It was Prior found that Bracket-length $B_L = \Delta = 2a = 3,\ 5537772\ .\ 10^{-10}$ m , so
Above relations $C_L = 10.\ H_L = B_L$ allows the Strong Carbon-Hydrogen Bonds .

5i.. The How Energy Orbits become Nucleus-Hooks :

Energy of Photon = motion / T ≡ $(\frac{v}{2\pi r}).[\sigma + \sigma\,\Phi]$= velocity → $\bar{\mathbf{v}}\ .[\frac{\sigma}{2\pi r}+\frac{\sigma\Phi}{2\pi r}] \equiv \bar{\mathbf{v}}.[\ \boxed{\bar{f}_n}\ + \mathbf{f_n}\ ]$
Both motions , in Orbits and in Nucleus , being in a Potential creates a Total-Magnetic-field

$$\mathbf{M_T = M_N + M_O} \qquad \text{…….. (1a)}$$

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 $M_{T1} + M_{T2} = M_{N1} + M_{O1} + M_{N2} + M_{O2}$,
or $M_{T[1-2]} = [M_{N1}+M_{N2}] + [M_{O1}+M_{O2}] \equiv |\bar{R}|$ ……..(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 $\mathbf{f_R}$, 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 $M_1X + M_2Y + M_3Z = 0$ ……..(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 , $r_{1,2} = [\bar{R}M_T] / |R^2|$, of Atoms-System P-e .
The Total-Energy for Unit-mass is as → $E = K_E + P_E = (½)\ \dot{x}^2 + U(x) = \text{constant}$.
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 , $g\ f^2\pi^3 = 1 = g\ \pi^3.[\frac{B^2}{p}]$ ..(4)

System-Total-Energy → $L = \bar{B}\ \bar{w} = \frac{J.w}{2}\ w = \frac{\pi r^4}{2}\ [2\pi f]^2 = \mathbf{2\pi^3 r^4 f^2} = r\ mv = r\ m.wr$, and mass
$\mathbf{m} = \frac{2\pi^3 r^4, f^2}{r^2 2\pi f} = \frac{\pi^2 r^2}{1}\mathbf{f} = [\frac{2\pi\ r}{4}].\bar{\mathbf{v}}$, while **Angular-Momentum** $\bar{\mathbf{B}} = r.mv = r\ [\frac{\pi r v}{2}]\ v = [\frac{\pi\ r^2}{2}].v^2$
i.e. **The Spin is Related to Cave , r^2 , and Energy v^2 , the light velocity squared ..**
The measuring Process follows ,Total System-mass m_T , Hydrogen-Resonance frequency f_R , Common-Energy-Bracket-cave $\Delta = 2a$ **.** Or from Total-Energy-System equation ,
$\mathbf{2L = B\ w = B\ 2\pi f = 2\pi.[\frac{B^2}{\pi^2 r^4}] = [\frac{2.B^2}{\pi\ r^4}] \equiv h.\ f_R}$, and $\mathbf{f_R} = [\frac{2.B^2 \equiv 2\ S^2}{h.\pi.r^4}] \equiv [\frac{2\ S^2}{h.\pi.r^4}]$ i.e.
The Resonated frequency between two Atoms is related to their Spin B ≡ S and the created Resonated frequency $f_R \equiv [\frac{2\ S^2}{h.\pi.r^4}]$ on the Molecules M_{1-2} ,
denoting that **The Constant-conserved-Energy is the ,** Nutation **of Spin only.**
The Data of Bonding → $\bar{M}_T = \bar{S}_N + \bar{S}_O$,
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***] ≡ 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*** $\mathbf{f_R}$ ***is added in*** N-O ***loop or in*** → [The m_N , m_O ***Current-Potential-loop*** E = U(x)] as before .

e).. **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 .**

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 $\overline{M}_T = \overline{S}_N + \overline{S}_O$ where $\overline{M}_T = \overline{L} = I \times w$, **and** is Swinging on the **Precession-circle** and **w-Nib on Polhode curve** , **then the Resultant** $\overline{M}_T$,which is the Diagonal (Magnitude) of the Parallelogram with sides equal to $\overline{M}_N$, $\overline{M}_O$, **Changes** according to their rotation axis with angle ϑ .

At Nutation-Period , $\overline{M}_O$, **is Swinging** and angle ϑ **Decreases or Increases** , **so** their **Diagonal-Resultant** $\overline{M}_T$ **Increases or Decreases** and the Energy is transferred in → [m_N , m_O***Current-Potential-loop*** U(x)] ≡ **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 ⊥ to the variated $\overline{R}$ 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 $P_E \equiv U(x)$] . Hook PO = The Rim ,

This ORBIT-RIM is → **The Nucleus-Bracket-Rim-Vector ← 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 $\overline{R}$ as in (F16-3) .

Remark-3 → 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** ≡ ⊕Proton↔⊖Electron which **ORIGINATES The-Constant-Resonance-frequency** $\mathbf{f_R}$ 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** $\mathbf{f_R}$ **,** 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 ẋ of the **Orbiting-Electron Creates Work which is Conserved** as an **Electron-Magnetic-Field** , or **Magnetic moment** , $\overline{\mu}$, **i**n a time **T ,** and is a **Resonance-frequency** $\mathbf{f_R}$ **.**

When velocity ẋ = 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 swingging around the Magnetic-Vector** and this Motion , ***Nutation*** **, is transferred to the Nucleus**.

The Produced-Work as Frequency $\mathbf{f_N = \frac{sQ}{2\pi . J_3 w} \equiv f_R = 2{,}8398447.10^{10}}$ s^{-1}

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

Because of the Magnetic-field created **On-Orbit and Applied at-Nucleus with the same Effect then , exists LARMOR Equation as ,** $\mathbf{w_0 = \gamma . \beta_0 / 2\pi}$ **,** and for Hydrogen at 1,5 T Magnet , $\gamma = 2{,}675. 10^8$ /sT , β_0 = 1,5 T , then frequency **w** = 63,864 MHz = 63,864.10^8 Hz , frequency $\mathbf{f_N = 2\pi . w = 4{,}012575. 10^{10}}$ $\mathbf{s^{-1}}$.

Remark - 4 → On Figure – 9 :

BONDING , $\mathbf{f_N = \frac{sQ}{2\pi . J_3 w}}$ **,** 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 $\mathbf{f_R}$ and **requires more Energy Input** including that frequency . Nucleus with Spin S≠0 can absorb and emit Electromagnetic Radiation and undergo ,**Resonance**, when placed in a magnetic field. **This Magnetic-field of** Nucleus - Orbit **[p ↔ e] already exists in Protons ,** which Eternally becomes from the Swinging of the **Electron**-Angular-velocity-Cone **, with the Spin-Vector** $\bar{\mathbf{S}}$ 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** $\acute{\boldsymbol{\psi}}$ is under **NUTATION** $\acute{\vartheta}$ **,** and the **Response** is the **PRECESSION** $\acute{\varphi}$, or
THE → GRAVITY-ELECTRON-NUTATION ← is applied for a short time in the **Plane Perpendicular ,** $\perp$ **, to the variated Moment-Vector ,** $|\bar{\mathbf{R}}| \equiv |\mathbf{M_T}| = |\mathbf{M_N}|+|\mathbf{M_O}|$ and the Work produced is **Conserved** in → Nucleus - Orbit **[p ↔ e]** ≡ Energy-Box .
The angular velocity-cone $\bar{\mathbf{w}}$ **is Rolling with Spin-Vector** $\bar{\mathbf{B}}$ **in the central cone.**
6i.. The Process of Atom – Bonding :
Hydrogen-cave , becomes from the **G** Pushing → on **g** , on the Earth-Unit-coefficient, k_E , from Relation $G = g.[g_L\, k_L] \equiv g\,.[1*1] \equiv \rightarrow g$, or $\mathbf{G = g}$, while in all other relative Systems are equal to the proportionality of their Local-constant $\mathbf{k_L}$.
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 → $\mathbf{a = \sqrt[3]{T^2/g}} = \sqrt[3]{\mathbf{1/g\, f^2}} = 2{,}1145016.10^{-11}$ m ....(1) in Planck cave.
Electron Charge is created through vibration , $\mathbf{f_n}$,in the **Energy-Space-meters** ,**g** ,$\boldsymbol{\pi}$ from M-Point ,frequency → $f_N = n\,\frac{(1+\sqrt{5})\sigma}{4\pi r}$, and→ $\mathbf{w} = 2\pi.f_N = n\,\frac{(1+\sqrt{5})\sigma}{2r} = |\frac{n}{r}|.\frac{(1+\sqrt{5})\sigma}{2}$
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,
$\frac{\mathbf{w_n}}{\mathbf{2\pi}} = \mathbf{f_e} = \frac{1}{2\pi}\sqrt{\frac{k}{m}} = 3{,}283998.10^{15}$/s , or $4\pi^2\, f^2{}_e.m_e = \mathbf{k} = \boldsymbol{\pi}\,\mathbf{g}$ and → $\mathbf{m_e} = \frac{g}{4\,\pi\, f^2{}_e}$
All above Physical Structures Vibrate , ***In-Vectors*** with minimum Energy **,** and are forming the→ **Electron-charge ←** ***In Surfaces*** with minimum Energy **and forming the Orbitals .** Orbit relation $\mathbf{r^3\, f^2{}_p = Constant}$, as multiplication of cave **r** , and the frequency $\mathbf{f_N} \equiv$ Energy and the **Work** → which is motion ≡ h $\mathbf{f_1}$ is conserved in orbit **r** as energy $E = \frac{\sigma\Phi.\bar{B}}{2\,r} = \frac{(1+\sqrt{5})}{2}\frac{\{h\,\sigma\}}{\{2\pi r\}} = |\bar{\mu}|.\pi r^2$ in **n** , frequencies → $\mathbf{f_N = n}\,\frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{n\sigma.\bar{B}}{\pi^3 r^4}$
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 ⊕ Particles Jointed with Neutron-Material-Points in the center called Nucleus ≡ Focus , and the Negative-Charged-Particles ⊖ , moving in the ***Energy-Rims*** **≡** ***E-Ring-Hooks*** .
Some Atoms occupy the **Nucleus-Slit-Brackets** in Focus and the **Orbit-Brackets** on Orbits . which consist the **Charged-Moulds → 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 ≡ 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 $\bar{R} \equiv \sqrt[2]{X^2+Y^2+Z^2}$,central axis , creates the Two Opposite Spins S , perpendicular each other and $[M_{T[1-2]}]x[\bar{R}] \equiv 0$.
From above ,the only Energy in Nucleus is **the Spin ≡ 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** .

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 ± **IONS** ≡ **CHARGES** .

A **Second way is the Joint** of Two Atoms with an **Electric Field-Loop ≡ Mould** which **is Charged ,** and Supported on Atoms with , **Brackets** , if such exist .

Such Brackets exist on **Nucleus as → The-Slit-Proton-Brackets** ←and on **Orbits →The Orbit-Rim-Hook ≡** ± **IONS** ←all used for the **Electron-Orbit-Hook** Joints.

From analysis is seen that Atoms occupy the maximum Energy , at the closest approach $\mathbf{r_P}$, where at Focus is the maximum Potential-Energy ,

i.e. Orbits with min $\mathbf{r_P}$ 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 → ***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 → occur on **Helium** forming ± Vector-Bond ← He →

b. The-Two-Plane -Brackets → occur on **Lithium** forming , Plane Regular-Hexagon

c.. The-Three-Volume-Brackets → 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 ⊕ **Brackets** on Nucleus and the ⊖ **E-Orbit-Rings ≡ 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 $\mathbf{E= h.f_N}$ = $6.62607.10^{-34}.2{,}8398447.10^{10}$ = $18{,}817009.\ 10^{-24}$ J / $(1{,}6.\ 10^{-19})$ = $\mathbf{1{,}1760625.}10^{-4}$ **eV** ……(1)

i.e. The Potential-Energy Produced Due Nutation may be added to any Energy-level.

From Hydrogen Energy Levels Energy $E = \frac{-13{,}6\ eV}{n^2}$, and for n=1 then E = -13,6 eV

The Total Energy in Orbit =$1{,}1760625.10^{-4}$ - 13,6 = - 13,599824 eV , and Mould is

The Bracket → { **NUCLEUS+ORBIT-VECTOR+ELECTRON }≡ E= h.f** $_N$ ….(2)

The **Proton`s-Brackets** are FIXED on **(A)** Atom **NUCLEUS →Proton-Slit-Focus** ← and on **NUCLEUS** of Atom **(B) as** → ⊖ → ⊕ **Electron-Proton** of Atom (B) , OR on **Orbits** of Atom **(B) as → Orbit-Electron-Ring-Joint** ← Covalent-Bonding .

The Nutation-Electron at the End of Orbit-Vector is to-be Attract by the , ⊕ ,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 ≡ E = h.f $_N$ **, Electron by getting Potential-Energy in loop** $\mathbf{U_1+U_N}$ **, 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 → **Charged-Electric field Loop** of **Hydrogen** ←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 ≡ 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 $\mathbf{4\pi f^2_e . m_e = g}$, $w = 2\pi f$, from which occupy the **Direction** of $\mathbf{v} = 2\pi \mathbf{d}.\mathbf{f}$ → 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 ≡ **N-Brackets , O-Hooks**

1.. H = Hydrogen	2 e	1 e	1 p=Proton	**1**		↔	**1** , 2
2.. He= **Helium.**	2 e	0	**2** p	**2**		↔	**2 ,** 2
3.. Li = Lithium.	8 e	7 e	3 p	**3**		↔	**3** , 7
4.. Be = Beryllium	8 e	6 e	4 p	**4**	Plane	↔	**4 ,** 6
5.. B = Boron	8 e	5 e	5 p	**3**	Volume	↔	**3** , 5
6.. C = Carbon.	8 e	4 e	6 p	**4**	Volume	↔	**4** , 6
7.. N = Nitrogen.	8 e	3 e	7 p	**3-5**	Plane	↔	**3 ,** 5
8.. O = Oxygen.	8 e	2 e	8 p	**2-4**	Line.	↔	**2 ,** 6
9.. F = Fluorine.	8 e	1 e	9 p	**1-5**	Line.	↔	**1 ,** 6
10..Ne = **Neon**	8 e	0 e	**10** p	**2**		↔	**2 ,** 0
11..Na = Sodium	11 e	7 e	11 p	**1**.		↔	**1** , 1
12..Ma = Magnesium	12 e	6 e	12 p	**1**.		↔	**1** , 2
13.. Al = Aluminum	13 e	5 e	13 p	**1**		↔	**1** , 3
14..Si = Silicon.	14 e	4 e	14 p	**1**		↔	**1** , 4
15..P = Phosphorus.	15 e	3 e	15 p	**1**		↔	**1 ,** 3
16..S = Sulfur	16 e	2 e	16 p	**1**		↔	**1** , 2
17..Cl = Chlorine.	17 e	1 e	17 p	**1**		↔	**1** , 1
18..A = **Argon**	18 e	0 e	**18** p	**2**		↔	**2 ,** 0
19..K = Potassium.	19 e	17 e	19 p	**1**		↔	**1** , 1
20..Ca = Calcium.	20 e	16 e	20 p	**2**		↔	**2** , 2
21..Sc = Scandium.	21 e	15 e	21 p	**1**		↔	**1** , 3

On the **Occupied-Positions** , **The Nucleus-Protons ,** are Joint the Energy-Brackets as is { **Electric-Field–Loops ≡** EF-Loop**}** ↔ Brackets ≡ **Proton – Electron - Hook ,**

Brackets on the ***Nucleus*** are 1).. Nucleus →**Nucleus–Electron–Proton-[**EF-Hook**]**

2).. Nucleus →**Proton–Electron – Proton [**EF-Loop**]**

Brackets on Orbits are the 3).. Orbit → **Electron – Electron –** [EF-Loop**]**

Bonding occurs between **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 lower Voltage and Bond .This Hydrogen-Linear-Orbit [⊕→⊖] of High

Energy-Vector is the **Orbit-Charge-Hook** .

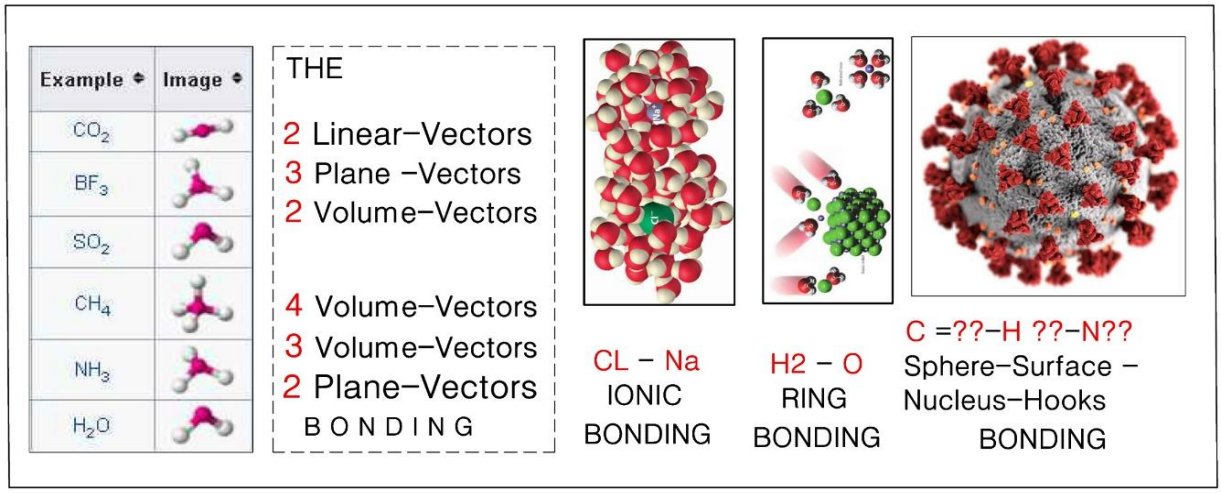


Figure – 36 - : The Vector , Linear , Plane , Volume , are The Elements-Types for Bonding.

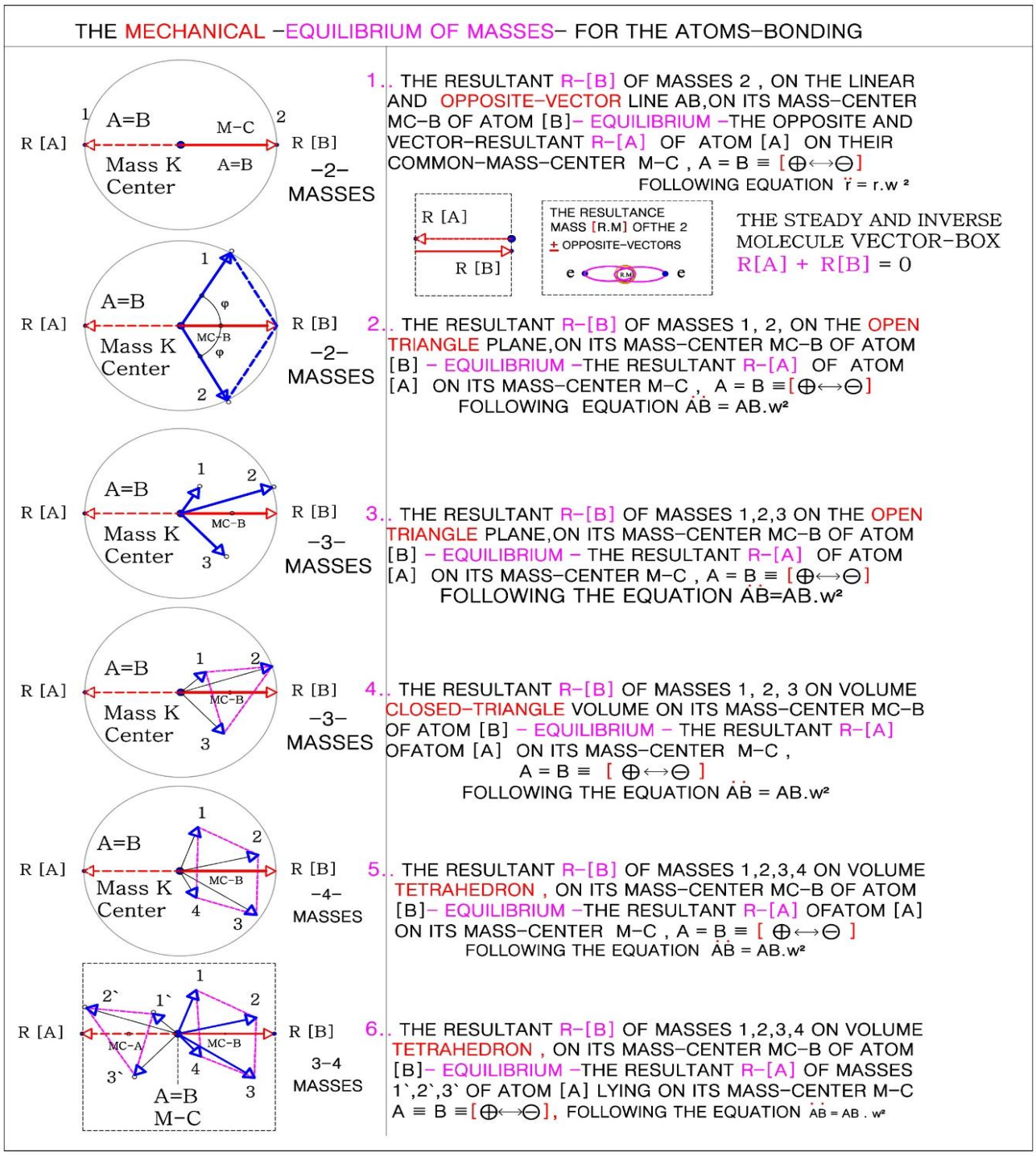


Figure – 37 - : The Vector , Linear , Plane , Volume , Elements-Types , of Bonding .

In (1) is shown the Stability of the Opposite-Vectors $\overleftarrow{A} \leftarrow K \rightarrow \overrightarrow{B}$ at K , center of equilibrium in the Molecule [A-B] .

In (2)-(6) is shown Vector , KA . It is the Resultant of masses on Atom [A] and is equal and Opposite to Vector , KB , which is the Resultant of masses on Atom [B] where issues $\overrightarrow{KA} + \overleftarrow{KB} = 0 \equiv$ Molecule [A-B] .

The-Energy-Bracket as **Proton-Electron-Orbit-Vector joint {**where $E = h.f_N = 1{,}1760625.10^{-4}$ 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 $\{R\text{-}M\} = \sum_1^n mi$ so ,

In A-B axis issues the Stability of Vectors from Symmetry and Equality .

From Material-Geometry-Rules where **P** ≡ Charge-Positions , **D** ≡ Dimensions ,

a.. The-One-Linear-Bracket → occur on **Hydrogen** forming + Vector-Bond [K → B]

He-H $^{1\text{Direction}-\infty\text{Vectors}}_{2\text{Linear}\pm\text{Vector}-2\text{Position}}$ ≡ **He- {**H $^{1\text{D}-\infty\text{Vectors}}_{2\text{LP}}$ ≡ H $|^{1\text{D}\rightarrow\text{V}}_{1\text{N}-\text{LP}}|\}$,

b.. The-Two-Linear-Brackets → occur on **Helium** forming ± Vector-Bond ← He →

[1 ← K]-[K→2] ≡ **He**-H $^{1\text{D}-2\text{Line}\pm\text{Vectors}}_{2\text{LP}\rightarrow\varphi\text{Line}}$ ≡ **He** $|\text{X}^{1\text{D}\leftarrow\pm\rightarrow}_{2\text{N}-\text{LP}}|$,

c. The-Three-Plane -Brackets → occur on **Lithium** forming , Plane Regular-Triangle.

[K → 1]-[K→2]-[K→3] ≡ **Li**-H $^{2\text{D}-\text{Triangle}}_{3\text{PP}=\text{Plane}}$ ≡ **Li** $|\text{X}^{2\text{D}-\text{Tri}}_{2\text{N}-\text{PP}}|$,

d. The-Four-Plane -Brackets → occur on **Beryllium** forming , Plane Regular-Orthogonal

[K → 1]-[K→2]-[K→3]-[K→4] ≡ **Be**-H $^{2\text{D}-4\text{Sited}}_{4\text{PP}=\varphi\text{Plane}}$ ≡ **Be** $|\text{X}^{2\text{D}-4\text{Si}}_{4\text{N}-\text{PP}}|$,

e.. The-Three-Volume-Brackets → occur on **Boron** forming , the Solid Regular Tripod

[K → 1]-[K→2]-[K→3] ≡ **Bo**-H $^{3\text{D}-\text{Tripod}-\text{Pyramid}}_{3\text{vP}=\text{Solid Positions}}$ ≡ **Bo** $|\text{X}^{3\text{D}-3\text{Pyr}}_{3\text{N}-\text{VP}}|$,

f.. Four-Volume-Bracket-Hooks → occur on **Carbon** forming the Solid-Regular-Tetrahedron

[K → 1]-[K→2]-[K→3]-[- K→4] ≡ **C**-H $^{3\text{D}-4\text{Points Regular}-\text{Tetrahedron}}_{4\text{vP}\rightarrow\varphi=60-\text{Solid Point Positions}}$ ≡ **C** $|\text{X}^{3\text{D}-\text{Teh}}_{4\text{N}-\text{VP}}|$,

as the first 3-DIM-Mould on {R-T} , which is the Base of **Organic-Chemistry** $\mathbf{C_1\,H_4}$.

g.. Three-Volume-Bracket-Hooks → occur on **Nitrogen** forming , the Solid-Regular-Triangle

[K→1]-[K→2]-[K→3] ≡ **N**-H $^{2\text{D}-\text{Triangle}}_{6\text{P}=\varphi\text{Plane}}$ ≡ **N** $|\text{X}^{2\text{D}-\text{Hex}}_{6\text{N}-\text{PP}}|$

h.. Two-Plane-Bracket-Hooks → occur on **Oxygen** forming , Two-Perpendicular ⊥ Vectors

[K→1-1]-[K→2-2] ≡ **O**-H $^{2\text{D}-2\perp\text{Plane Vectors}}_{2\text{P}\rightarrow\varphi=90\rightarrow\text{Plane}}$ ≡ **O** $|\text{X}^{2\text{D}\rightarrow\downarrow\text{V}}_{2\text{N}-\text{PP}}|$

or the Solid Regular-Tripod .

i.. One-Line-Bracket-Hook → occurs on **Fluorine** forming , The One-Direction-Vector

[K→1] ≡ **F**-H $^{1\text{D}-\text{Line Vector}}_{1\text{P}\rightarrow\varphi\text{ Line}}$ ≡ **F** $|\text{X}^{1\text{D}\rightarrow\text{V}}_{1\text{N}-\text{LP}}|$

j.. Two-Line-Brackets-Hooks → occur on **Neon** forming , The two Opposite ± Line-Vectors ,

[1→K]-[K→2] ≡ **Ne**-H $^{1\text{D}-2\pm\text{LineVectors}}_{2\text{P}\rightarrow\varphi=180\rightarrow\text{Line}}$ ≡ **Ne** $|\text{X}^{1\text{D}\leftarrow 8\rightarrow\text{V}}_{1\text{N}-\text{LP}}|$

n.. The-$\mathbf{n_{th}}$Space-Brackets → 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** $|^{1\text{D}\rightarrow\text{V}}_{1-\text{LP}}|$, **He** $|^{1\text{D}\pm\leftarrow}_{2-\text{LP}}|$, **Li** $|^{2\text{D}-\text{Tri}}_{2-\text{PP}}|$, **Be** $|^{2\text{D}-4\text{Si}}_{4-\text{PP}}|$, **Bo** $|^{3\text{D}-3\text{Pyr}}_{3-\text{VP}}|$, **C** $|^{3\text{D}-\text{Teh}}_{4-\text{VP}}|$ **N** $|^{2\text{D}-\text{Hex}}_{6-\text{PP}}|$, **O** $|^{2\text{D}\rightarrow\downarrow\text{V}}_{2-\text{PP}}|$, **F** $|^{1\text{D}\rightarrow\text{V}}_{1-\text{LP}}|$, **Ne** $|^{1\text{D}\rightarrow\text{V}}_{1-\text{LP}}|$, **Na** $|^{2\text{D}-\text{El}}_{1-\text{PP}}|$, **Ma** $|^{2\text{D}-\text{El}}_{1-\text{PP}}|$, **i.e.**

After The-3D-Solid , **X** , Atom follows { $^{\infty,1\,,2\,,3-\text{Dim}-\text{Shape}}_{\text{n,Space}-\text{Positions}}$ **X** or $\mathbf{X}^{1,2,3-\text{Dim}-\text{o}}_{\text{n.Plane}+\text{Posit}}$ } Bonding

Explanation : **Symbol** of **Carbon C** is → **C** $|^{3\text{D}-\text{Teh}}_{\text{n}=4\text{N}-\text{VP}}|\equiv$ **C** $|^{3\text{ Dimension}-\text{Hooks onTetrahedron}}_{4\text{ Brackets}-\text{Volume Position}}|$,

Where , **4N - Brackets** is the number of the - **Nucleus → Proton–Electron-[**EF-Loop**]** while 4O-Brackets is the - **Orbit → 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 .

Spin $\bar{\text{S}}$, as Space + Energy in caves → $\bar{\text{S}}\equiv\frac{\bar{\text{c}}.\text{r}}{\text{g}}\bar{\text{q}}$, creates the Two-Types of Charges $\pm\bar{\mathbf{q}}$, which are the Sources of Electromagnetism and from Charges $\pm\bar{\mathbf{q}}$, the Coulomb-forces **F** which Forces Joint the Charges through the **Constructive [⊕→(+)←⊕]** or **[⊖→(+)←⊖] ,** and to the **Destructive [⊕→(-)→⊖] Interference** .

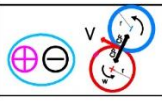
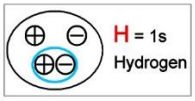
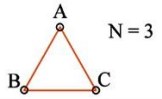
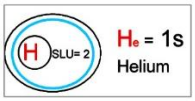
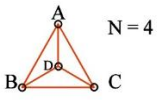
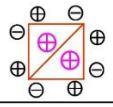
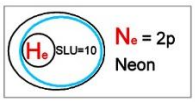
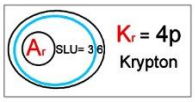
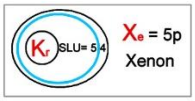
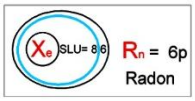
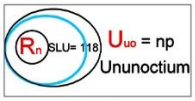
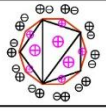
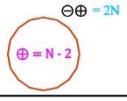
Euclidean`s Geometry Quantized Spaces		Euclidean Geometry	Material Geometry	Material Dimensions	Permitted Units ⊖-⊕	MOULDS Permitted Positions	S L U The Full Orbital Units
1		2			3		4
1	Point	• A		The First ONE Dimention Point - Space	2	2 P^2	The Inner-Atoms Onion - Structure
2	Line Segment	A B		The First ONE Dimention Line - Space	4	1	 H = 1s Hydrogen
3	Plane Reg.3gon	 N = 3		The First TWO Dimention Plane - Space	6	2	 H_e = 1s Helium
4	Volume Reg.4gon	 N = 4		The First THREE Dimention Volume - Space	8	8	 N_e = 2p Neon
5	Space Reg.5gon	 N = 5		The First FOUR Dimention Volume -Space	10	18	 A_r = 3p Argon
6	Space Reg.6gon	 N = 6		The First FIVE Dimention Volume - Space	12	32	 K_r = 4p Krypton
7	Space Reg.7gon	 N = 7		The First SIX Dimention Volume - Space	14	50	 X_e = 5p Xenon
8	Space Reg.8gon	 N = 8		The First SEVEN Dimention Volume - Space	16	72	 R_n = 6p Radon
9	Space Reg.9gon	 N = 9		The First EIGHT Dimention Volume - Space	18	98	 U_{uo} = np Ununoctium
10	Space Reg.10gon	 N = 10		The First NINE Dimention Volume - Space	20	128	P = Number of Positives = N-2 and N = Spaces = The Number of Points
N	Space Reg.Ngon	 N = N	 ⊖⊕ = 2N ⊕ = N - 2	The First N - 1 Dimention Volume - Space	2 N	162 / 2 N^2	

Figure – 38- : Euclideean and Material-Geometry-Elements . The Atoms Structure is that of Onion under-Plane-conditions .The three Elements Generate Microcosm + Macrocosm. The **Three Elements** ≡ Digits of Material-Geometry are { ⊕ , [⊕↔⊖], ⊖ } ≡ [+, 0 , -] The Positive , The Zero , The Negative with their Global meaning .
The Heap of Masses **m** = M_T follow Newton laws , The Charges [⊕, $\pm \bar{\mathbf{q}}_\mathbf{p}$,⊖] follow the Coulomb law , The Zero-Electron Charges [⊕↔⊖] ≡ ± **0** , the Material-Geometry Rules the Arrangements , ***The Positions*** **n** , the Material-Geometry Rules of Combinations and Permutations **.** Charges [⊕, $\pm \bar{\mathbf{q}}_\mathbf{p}$,⊖] 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 .

7i.. The Atoms – Bonding Mechanism :
1..The Helium Bonding : **He** $|^{1D\ \leftarrow\pm\rightarrow}_{2N-LP}|$ ≡ **He** $|^{1D}_{2}|$ ↔ with Hydrogen and others is as , **He** $|^{1D}_{2}|$ ↔ H^0_1 ≡ $H_e[X\,^1_2]$, where at Nucleus-Bracket-Hook Index **2** , can be Placed Any Two Elements of table Occupying , 1 or 2 , Charge-Positions

Under the Energy-Cave-Obligation $f_1 = \frac{1}{2\pi}\sqrt[2]{\frac{g}{2r^3}}$, so exists

$H_e \leftrightarrow [X\,{}^{1}_{2}] \equiv H_eH_e\ ,\ H_eH\ ,\ H_eL_i\ ,H_eB_e\ ,\ H_eB\ ,H_eF_2\ ,\ H_eNa_2\ ,\ H_eMa_2\ ,\ H_eAl_2\ ,$
$\equiv H_eSi_2\ ,\ H_eP_2\ ,\ H_eS_2\ ,\ H_eCl_2\ ,\ H_eK_2\ ,\ H_eN_2\ ,\ H_eCOH\ ,H_e[HN]\ ,$
$\equiv H_e[ON_a]\ ,H_e[M_aF]\ ,H_e[OH_2+OH_2] = H_e[H_2O]2\ ,H_e[B_eNH] = H_eB_eNH$

2..The Carbon Bonding : $\mathbf{C}\,|\,{}^{3D-Teh}_{4N-VP}\,| \equiv \mathbf{C}\,|\,{}^{3D}_{4}\,| \leftrightarrow$ with Hydrogen and others is as ,

$\mathbf{C}\,|\,{}^{3D}_{4P}\,| \leftrightarrow H^0_1 \equiv C[X\,{}^{3}_{4}]$,where at Nucleus-Bracket-Hook Index **4** , can be Placed Any 1-4 Elements of table Occupying , 1 to 4 , Charge-Positions .

$C \leftrightarrow [X\,{}^{3}_{4}] \equiv [H\,] \rightarrow C\,[X\,{}^{1}_{4}] \rightarrow CH_4\ ,$
$\equiv [H\,] \rightarrow C\,[X\,{}^{1}_{1-4}] \rightarrow CH_1\ ,\ CH_2\ ,CH_3\ ,CH_4\ ,$
$\equiv [H_e] \rightarrow C\,[X\,{}^{1}_{2+2}] \rightarrow C\,H_{e_2}\ ,\ CH_eH_2\ ,$
$\equiv [L_i] \rightarrow C\,[X\,{}^{1}_{2+2}] \rightarrow C\,B_{e2}H_2\ ,C\,L_iH_2\ ,$
$\equiv [B_e] \rightarrow C\,[X\,{}^{1}_{1-3}] \rightarrow CB_eH\ ,\ CB_eH_2\ ,$
$\equiv [B\,] \rightarrow C\,[X\,{}^{1}_{1-3}] \rightarrow CBH\ ,\ CB_2H_2\ ,\ CB_3H_1\ ,$
$\equiv [O\,] \rightarrow C\,[X\,{}^{3}_{4}] \rightarrow C_2OH_6\ ,C\,O_4F\ ,C\,O_4F_2\ ,C\,O_4F_4\ ,C\,O_4F_4\ ,$

The Compounds of Carbon are as $\rightarrow C \leftrightarrow C_n = C\,C\,{}^{3D}_{4n-2(n-1)} = C_nH_{2(n+1)}$, and for

n = 1 , $C \leftrightarrow C_1 = C_1H_{2(1+1)} = C\,H_4$,
n = 2 , $C \leftrightarrow C_2 = C_2H_{2(2+1)} = C_2H_6\ ,C_2H_2$,
n = 3 , $C \leftrightarrow C_3 = C_3H_{2(3+1)} = C_3H_8$,
n = 4 , $C \leftrightarrow C_4 = C_4H_{2(4+1)} = C_4H_{10}$
n = 5 , $C \leftrightarrow C_5 = C_5H_{2(5+1)} = C_4H_{12}$
n = 6 , $C \leftrightarrow C_6 = C_6H_{2(6+1)} = C_4H_{14}$
n = n , $C \leftrightarrow C_n = C_nH_{2(n+1)} = C_nH_{2(n+1)}$

The Compounds of Carbon $\mathbf{C}\,|\,{}^{3D}_{4P}\,| \leftrightarrow \{N\,{}^{3D}_{3P}] \equiv [X\,{}^{3}_{4}\} \rightarrow C\,[X\,{}^{1-3}_{1-3}\,] \rightarrow CH_3N_1\ ,CH_2N_2\ ,CH_1N_3$

The Compounds of Carbon $\mathbf{C}\,|\,{}^{3D}_{4P}\,] \leftrightarrow \{O\,{}^{2D}_{2P}] \equiv [X\,{}^{2}_{2}\} \rightarrow C\,[X\,{}^{1-3}_{1-3}\,] \rightarrow CO_1H_3\ ,CO_2H_3\ ,CO_3H_1$
$\rightarrow CO_4F_1\ ,\ CO_2$

The Compounds of Carbon $\mathbf{C}\,|\,{}^{3D}_{4P}\,] \leftrightarrow \{F\,{}^{3D}_{1P}] \equiv [X\,{}^{3}_{1-4}\} \rightarrow C\,[X\,{}^{1-3}_{1-3}] \rightarrow CF_1H_3\ ,CF_2H_3\ ,CF_2H_2$
$\rightarrow CF_3H_1\ ,CF_3\ ,\ CF_4$

The Compounds of Carbon $\mathbf{C}\,|\,{}^{3D}_{4P}\,] \leftrightarrow \{Ne\,{}^{1D}_{2P}] \equiv [X\,{}^{1}_{2-4}\} \rightarrow C\,[X\,{}^{1-3}_{1-3}] \rightarrow CNe_1H_2\ ,CNe_2H_2\ ,$
$\rightarrow CNe_3H_1$

The Compounds of Nitrogen $\mathbf{N}\,|\,{}^{2D}_{3PP}] \leftrightarrow \{H\,{}^{0D}_{1P}] \equiv [X\,{}^{1}_{1}\} \rightarrow N\,[X\,{}^{1}_{1}] \rightarrow NH_3\ ,NHe_1Li_1\ ,NH_1He$
$\rightarrow NLi_2H\ ,NHNa_1Cl\ ,N_2BeH\ ,NBe_1H\ ,\ NBH\ ,$

The Compounds of Nitrogen $\mathbf{N}\,|\,{}^{2D}_{3PP}] \leftrightarrow \{C\,{}^{3D}_{4NP}] \equiv [X\,{}^{1-3}_{1-4}\} \rightarrow N\,[X\,{}^{1-3}_{1-4}] \rightarrow NCH_3\ ,N_2CH_2\ ,N_1H$
$\rightarrow N_2CH_3\ ,N_3CH_2\ ,N_2CH$

The Compounds of Nitrogen $\mathbf{N}\,|\,{}^{2D}_{3PP}] \leftrightarrow \{O\,{}^{1D}_{2NP}] \equiv [X\,{}^{1-3}_{2LP}\} \rightarrow N\,[O\,{}^{1-3}_{2-3}] \rightarrow NKO_3\ ,NHO_3\ ,NPO_3$
$\rightarrow NOH,\ NO_2H\ ,NO_3,\ KNO_3\ ,N_2O\ ,$

The Compounds of Nitrogen $\mathbf{N}\,|\,{}^{2D}_{3PP}] \leftrightarrow \{\mathbf{Ne}\,{}^{3D}_{2OLP}] \equiv [X\,{}^{1-3}_{1-2}\} \rightarrow N\,[Ne\,{}^{1-3}_{1-2}]$, because for Noble-Gaz-Atoms issues $\rightarrow \{R\text{-}M\} = \sum_1^n mi$, and so
$\rightarrow NNeH_1\ ,NNe_2Na\ ,NNe_2Cl\ ,$

The Compounds of Nitrogen $\mathbf{N}\,|\,{}^{2D}_{3PP}] \leftrightarrow \{Na\,{}^{2D}_{1OP}] \equiv [X\,{}^{1}_{3L}\} \rightarrow N[Na\,{}^{1}_{1}] \rightarrow NNa_1\ ,NHNa_2\ ,NNa_3$

The Compounds of Nitrogen $\mathbf{N}\,|\,{}^{2D}_{3PP}] \leftrightarrow \{Ma\,{}^{2D}_{1OP}] \equiv [X\,{}^{1}_{3L}\} \rightarrow N[Na\,{}^{1}_{1}] \rightarrow NHMa_1\ ,NKMa_1\ ,NMa_3$

The Compounds of Sodium $\mathbf{Na}\,|\,{}^{2D}_{1OP}] \leftrightarrow \{Cl\,{}^{2D}_{1OP}] \equiv [X\,{}^{1-2}_{1L}\} \rightarrow Na[Cl\,{}^{1}_{1}] \rightarrow Na\,Cl\ ,NaCl_2\ ,NaH,$

Some Molecule **Common-Compounds** from **Inorganic-Substances** .

Carbon Monoxide	$CO \rightarrow \mathbf{C}\,|\,{}^{3D}_{4P}\,] \leftrightarrow \{O\,{}^{2D}_{2P}\,] \equiv [X\,{}^{2}_{2}\} \rightarrow C\,[X\,{}^{2}_{(1-2)}\,] \rightarrow CO$	,
Carbon Dioxide	$C\,O_2 \rightarrow \mathbf{C}\,|\,{}^{3D}_{4NVP}] \leftrightarrow \{O\,{}^{2D}_{2P}] \equiv \{X\,{}^{2D}_{(2+2)PP}\} \rightarrow C\,O_2$	,
Calcium Carbonade	$CaCO_3 \rightarrow \mathbf{C}\,|\,{}^{3D}_{4NVP}] \leftrightarrow \{O\,{}^{2D}_{2P}] \equiv \{X\,{}^{2D}_{(3+1)NP}\} \rightarrow C\,O_3Ca$	
Carbon Molecule	$C_2H_4 \rightarrow \mathbf{C}\,|\,{}^{3D}_{4NVP}] \leftrightarrow \{C\,{}^{3D}_{4NVP}] \equiv \{X\,{}^{2D}_{(2+2)NP}\} \rightarrow C_2H_4$	,
Carbon Molecule	$C\,H_2\,O \rightarrow \mathbf{C}\,|\,{}^{3D}_{4NVP}] \leftrightarrow \{O\,{}^{2D}_{4NVP}] \equiv \{X\,{}^{2D}_{(2+2)\,NP}\} \rightarrow C\,H_2O$	,
Water Molecule	$H_2\,O \rightarrow \mathbf{O}\,|\,{}^{2D}_{2NPP}] \leftrightarrow \{H\,{}^{2D}_{1OPP}] \equiv \{X\,{}^{0D}_{1OP}\} \rightarrow H_2O$	,
Ammonia	$NH_4 \rightarrow \mathbf{N}\,|\,{}^{2D}_{4PP}\,] \leftrightarrow \{H\,{}^{1D}_{1P}\,] \equiv [X\,{}^{2}_{4}\} \rightarrow N\,H_4$	,
Laughing Gaz	$N_2O \rightarrow \mathbf{N}\,|\,{}^{2D}_{3PP}\,] \leftrightarrow \{O\,{}^{1D}_{2NP}] \equiv [X\,{}^{1-2}_{2+1}\} \rightarrow N_2O$	,
Salpetre Powder	$KNO_3 \rightarrow \mathbf{N}\,|\,{}^{2D}_{4PP}\,] \leftrightarrow \{O\,{}^{1D}_{2NP}] \equiv [X\,{}^{1-2}_{1+3}\} \rightarrow KNO_3$	,
Nitric Acid	$HNO_3 \rightarrow \mathbf{N}\,|\,{}^{2D}_{4PP}\,] \leftrightarrow \{H\,{}^{0D}_{1LP}] \equiv [X\,{}^{2}_{1+3}\} \rightarrow HNO_3$	,
Sulfur Molecule	$S\,O_3 \rightarrow \mathbf{S}\,|\,{}^{2D}_{4OP}\,] \leftrightarrow \{O\,{}^{1D}_{3P}\,] \equiv [X\,{}^{1}_{3}\,\} \rightarrow S\,O_3$	,

Sulfur Molecule $SO_4 \rightarrow \mathbf{S} \mid {}^{2D}_{4OP}] \leftrightarrow \{O\,{}^{2D}_{2P}\} \equiv [X\,{}^{2}_{4}\} \rightarrow S\,O_4$,
Sulfuric Acid $H_2SO_4 \rightarrow \mathbf{S} \mid {}^{3D}_{2OP}] \leftrightarrow \{O\,{}^{2D}_{2+2P}] \equiv [X\,{}^{2}_{4}\} \rightarrow SO_4H_2$,
Mineral Salt $N_aCL \rightarrow \mathbf{Na} \mid {}^{2D}_{1OLP}] \leftrightarrow \{Cl\,{}^{3D}_{1OP}] \equiv [X\,{}^{1-2}_{1L}\} \equiv NaCl\,{}^{3}_{1} \rightarrow N_aCL$,
Potassium Permanganate $KMnO_4 \rightarrow \mathbf{O} \mid {}^{2D}_{4PP}] \leftrightarrow \{K\,{}^{1D}_{1LP}] \equiv [X\,{}^{2}_{1-4}\} \rightarrow KMnO_4$,
Oxygen Fluoride $O_n\,F_2 \rightarrow \mathbf{O} \mid {}^{2D}_{2-4PP}] \leftrightarrow \{F\,{}^{1D}_{(1-5)LP}] \equiv [X\,{}^{1}_{1-5}\} \rightarrow OF_2 , O_2F$,
$\rightarrow O_2FF = O_2F_2$, O_3F_2 , O_4F_2 , $O_4F_2F = O_4F_3$,
$\rightarrow O_4F_2O = O_5F_2$, $O_5F_2O = O_6F_2 \rightarrow O_nF_2$,

Remarks :

1..Molecules are of 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 for frequency $f_{1X=O} = \sqrt[2]{\frac{g}{2\pi.r^3}}$,

$f_{1X=O} = \sqrt[3]{\frac{9,808}{2.\pi^3(9,2.10^{-11})^3}} = \sqrt{2,0316022.10^{29}} = 4,5073298.10^{14}$ H and for Fluorine ,

$f_{1X=F} = \sqrt[3]{\frac{9,808}{2.\pi^3(3,8.10^{-11})^3}} = \sqrt{28,824571.10^{29}} = 16,9778 .\ 10^{14}$ 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.

8i… Fluorine , **9-Proton** [⊕] , 9-**Electron** [⊖] ,**10-Newtron** [⊕↻↺⊖] – [⊕↔ ⊖] :

PROTON is→ **[u u d]** $\equiv [+\frac{2}{3} + \frac{2}{3} - \frac{1}{3} + W^+] \equiv \left(+\frac{3}{3}\middle|\mathbf{W^+Z^+}\right) =$ Two **u**-Quarks and One **d**-Quark .

Interaction of Up-Quark **u** , and Up-Quark **u** , is → $\mathbf{u\,u} \equiv [+\frac{2}{3} + \frac{2}{3} + \mathbf{W^+}] \equiv \mathbf{\Sigma}\,{}^{[u\,u]}_{D_A > D_A}$ 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 [⊕ → ⊖ = +] ≡ $DI\,{}^{+,-}_{0+} \equiv \mathbf{Z^+}$
Since ,u u, Summation occupies Constructive-Interference , $\mathbf{W^+}$, therefore is Stable .
The Process from measurements ,

1… DATA .

Up-Quark mass $\mathbf{m_u} = 8,91.10^{-30}$ Kg , Charge $\mathbf{q_u} = [+\frac{2}{3}].1,602.10^{-19}$ C , Diameter **a** = $5,0.10^{-17}$ m , The Down-Quark $\mathbf{m_d} = 10,7.10^{-30}$Kg ,Charge $\mathbf{q_d} = [-\frac{1}{3}].1,602.10^{-19}$ C, mean-Diameter **a** = $5,0.10^{-18}$ m or ,

From $\mathbf{m_u} = 5,0.10^6$ eV/c² = $(17,826614.10^{-37}).5.10^6$Kg then = $8,913307.10^{-30}$ Kg
$\mathbf{m_d} = 6,0.10^6$ eV/c² = $(17,826614.10^{-37}).6.10^6$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 → $[y_1+y_2 \rightarrow y_3]$

The System Total-Harmonic-**Mass** $\equiv M_T$ is → $\frac{1}{M_T} = \frac{2}{m_u} + \frac{1}{m_d} = \frac{2.10^{30}}{8,9133} + \frac{10^{30}}{10,696} =$
$= \frac{30,305243.10^{30}}{95,336656} = \frac{10^{30}}{3,1458799}$ and , $\mathbf{M_T = 3\,,1458799\,.10^{-30}\ Kg\,.}$ …….(1)

The System Total- Harmonic-Charge ≡ $Q_T \equiv 2.q_u + q_d = 2.(2/3).e - (1/3)\,e = +\frac{3}{3}e =$
$+ 1,6022.10^{-19}$ C , and the **System-Resonance-Charge** $Q_T = +1, 6022.10^{-19}$ C ….(2)

Unit-Cave **Frequency** is the Stationary-System becoming from Kepler second Planetary-law equation , $4\pi^2\,m\,f^2_o = k$, and constant law of Areas $1 = k\,.\mathbf{f}^2_o\ \mathbf{a^3}$. Their common k , is the Constant-Energy → $k = 4\pi^2\,m\,f^2_p = \frac{1}{\mathbf{f}^2_p\,\mathbf{a^3}}$ or , $f^4_p = \frac{1}{4\pi^2 ma^3}$ 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

$f_{2u\rightarrow d} = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}} = \sqrt[4]{\frac{1}{4\pi^2 3,1458799\,.10^{-30}(5.10^{-19})^3}} = \sqrt[4]{805,18982.10^{80}} = 5,3269.10^{20}$ H

The System`s Energy is $\mathbf{E}_{2u\to d} = h.f_{2u\to d} = 6,62606957.10^{-34} \; . \; 5,3269.10^{20} = 35,29641.10^{-14}$ Joules / $1,6022.10^{-19}$ C = $22,029965.10^{5}$ eV = **2 , 2029965 MeV** ….(3)

The Magnetic-fields laws for Charges and Periods are, $\mathbf{T} = \frac{2\pi.m_T}{q.\bar{B}_F}$, $\bar{B}_F = \frac{2\pi.m_T}{q.T} = \frac{|2\pi.m_T|}{Q_T}$ f

so $\rightarrow \bar{B}_F = \frac{|2\pi.\mathbf{m}_T|}{\mathbf{Q}_T}\ \mathbf{f}_{2u\to d} = \frac{2\pi.[3,1458799.10^{-30}]5,3269.10^{20}}{1,6022.10^{-19}}$ (Kg/Cs) = **65,7 .10 ^{9}** Tesla. ….(4)

From Energy-Relation W =2E= B w = J.w² , or **2E = 2π f B** then **Total -Spin*Frequency** $\bar{\mathbf{B}}\ \mathbf{f} = \frac{\mathbf{E}}{\mathbf{g}}$, and E = $\bar{S}$.g.f = 5,691952.10^{-34} {Kg/m/s}.g.[5,3269.10^{20} H]/$1,6022.10^{-19}$ = 1,8562244.10 ^{6} eV = **1 , 85622** MeV , **i.e. the Energy produced from total Spin-System**.

From Planck`s length $\mathbf{a} = \sqrt[3]{\frac{k}{f^2}}$ then $\mathbf{k} = a^3.f^2$, and since **Energy** E = k then Cave $\mathbf{a} = \sqrt[3]{\frac{E}{f^2}}$

or **Action-Range** $a = \sqrt[3]{\frac{E}{f^2}} = \sqrt[3]{\frac{[22,029965.10^{5}]}{(5,3269.10^{20})^2}} = \sqrt[3]{7,763628.10^{-36}} = 1,98010509.10^{-12}$ m.

The **Weak Forces , $\mathbf{W^+Z^+}$,** in System is the Coulomb`s Force → [u+u] > [d] ≡[$\frac{4}{3}$-$\frac{1}{3}$+W^+Z^+] which may be calculated from the Time needed , for Harmonic-mass to vibrate in cave **r** , so from Energy equation $\mathbf{r} = \frac{m.v}{q.B} = \frac{[3,1458799.10^{-30}\,Kg].2,9978.10^{8}}{1,6022.10^{-19}.[65,7.10^{9}]} = \mathbf{8,959064.10^{-14}}$ m ….(5)

and for Weak Forces **, $\mathbf{W^+Z^+}$,** in cave $\mathbf{d = 10^{-14}}$ m then Period $\mathbf{T} = \frac{d}{c} = \frac{8,959064.10^{-14}m}{[2,998.10^{8}m/s]} =$

= **2,9883468 . 10^{-22} s** , and The produced Energy in **d** , is → $\mathbf{E}_{W^+Z^+} = \underline{h} / T =$

$= \frac{1,055.10^{-34}\,J.s}{2.[2,9883468.10^{-22}s].[1,602.10^{-19}\,J/eV]} = 1,10173.10^{6}$ eV≡ **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] x **Cave** [r] = **Voltage** [V_C] → so Weak-Forces $\mathbf{W^+Z^+} = [\frac{E_{W^+Z^+}}{r}] = \frac{1,1017.10^{6}}{8,959064.10^{-14}} = \mathbf{1,229736.10^{19}}$eV...(7) or from Weak-Forces

$\mathbf{W^+Z^+} \equiv [\frac{h/T}{2.r}] \equiv [\frac{h.c/d}{2.r}] \equiv \frac{h.c}{2.d.r} \equiv [\frac{\mathbf{h.c}}{\mathbf{2e.r^2}}]$ eV = $\frac{1,055.10^{-34}\,J.[2,998.10^{8}m/s]}{2.\left[1,602.\frac{10^{-19}J}{eV}.[8,95906.10^{-14}]^2\right]} = \mathbf{1,2297.10^{19}}$ eV

ELECTRON :

Electron is created through the vibration , $\mathbf{f_n}$, in the ***Unit-Energy-Space*** , **g - π** , ***meters*** and thus follows both Rotational and Linear motion and so the **Constant-Energy k** is the same.

From M-Point , frequency → $f_N = n\frac{(1+\sqrt{5})\sigma}{4\pi r}$, and→ $\mathbf{w} = 2\pi.f_N = n\frac{(1+\sqrt{5})\sigma}{2r} = |\frac{n}{r}|.\frac{(1+\sqrt{5})\sigma}{2}$

The **Spring-like Central-force** from a fix Point , *the Source* , on an attached , *Probe* , mass is → F = - k r = - k r.$\bar{r}$ as equation $\ddot{x} + w^2 x = 0$ …(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 $x = [\dot{x}(0)/w_n].\sin w_n t + x(0).\cos w_n t$ …(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 ,

$\frac{\mathbf{w_n}}{\mathbf{2\pi}} = \mathbf{f_e} = \frac{1}{2\pi}\sqrt{\frac{k}{m}}$, or $4\pi^2 f^2{}_e . m_e = \mathbf{k} = \boldsymbol{\pi}\,\mathbf{g}$ and → $\mathbf{m_e} = \frac{g}{4\pi f^2{}_e}$ ....(2)

where **k** = Unit-Spring-Force ≡ [***meter*** of area].[***meter*** of force ≡ ***stress***] ≡ **π g** ...(2a)

From Planck`s equation $\mathbf{f_e = E / h}$ = [- 13,6 x $1,602.10^{-19}$ = $2,17872.10^{-18}$ Joule] / [$6,626.10^{-34}$Js] = **3, 2881029.$10^{15}$**/s ,where min-energy -13,6 eV is that of Hydrogen atom . Substituting all the **minimum-meters of Planck`s scale** then , **Electron mass** ,

$\mathbf{m_e} = \frac{g}{4\pi f^2{}_e} = \frac{9,8076754}{4.\pi.[3,2881.10^{15}]^2} = \mathbf{-7,219016.10^{-32}}$ kg …… (2b)

$\mathbf{f_e}$ = **3, 2881029.10^{15}**/ s , and $\mathbf{L_e}$ = **1 , 6819781.10^{-17}** m ……..(2c)

Equations become from relation → $\mathbf{4\pi . f^2{}_e . m_e = g}$ ← In Planck`s length .

e-Charge Becomes through the **One way**- N -Electric-Paths [⊕≪→⊖] , which formulate the **Electric Field-Pattern** , following the Charge-equation → $\bar{q} \equiv \frac{m_e c^2}{2} = \frac{g c^2}{8\pi f^2}$.

Gravitational Force is equal to → the Geometric-Resultant of Light-velocity **c** , and is acting on **Electron-Unit-Charge** $\bar{\mathbf{q}}$ ← or , $\mathbf{G = c\sqrt{2}\ \bar{q}}$, so then Electron-Charge is

$\bar{\mathbf{q}}_{Electron} = \frac{G}{c\sqrt{2}} = \frac{6,6736923.10^{-11}}{1,41429.2,9979346.10^{8}} = 1,574.10^{-19}$ C .

NEUTRON is→ [d d u] ≡ [$-\frac{1}{3}$ -$\frac{1}{3}$+$\frac{2}{3}$ +W^-] **≡**(0 |$\mathbf{W^-Z^o}$)**=** Two **d**-Quarks and One **u**-Quark.

Interaction of Down-Quark **d** , and Down-Quark **d** , is → **d d** ≡ [$-\frac{1}{3}$ -$\frac{1}{3}$+$\mathbf{W^-}$]**≡Σ** $\frac{[\mathbf{d+d}]}{\mathbf{P_A>P_A}}$ and the Summation of Down-Quarks [d + d] of Cave P_A , **Is attacked** →<< 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 [$\oplus \rightarrow \ominus = 0$] ≡ [$+\frac{2}{3}-\frac{2}{3}+\mathbf{Z^o}$] or ,CI $\bar{}\,\vec{}\,\bar{}$ ≡ [W^-] + DI $^+\,\vec{}\,\bar{}$ ≡ $\mathbf{Z^o}$ and [d d u] ≡(0 |$\mathbf{W^-Z^o}$)

The Process from measurements ,

1… DATA .

The Down-Quark-mass $\mathbf{m_d}$ = 10,7.10^{-30}Kg , Charge $\mathbf{q_d}$ = [$-\frac{1}{3}$].1,602.10^{-19} C, mean-Diameter **a** = 5,0.10^{-18} m . Up-Quark mass $\mathbf{m_u}$ = 8,91.10^{-30} Kg , Charge $\mathbf{q_u}$ = [$+\frac{2}{3}$].1,602.10^{-19} C , Diameter **a** = 5,0.10^{-17} m , or ,

From $\mathbf{m_d}$ = 6,0.10^6 eV/c² → (17,826614. 10^{-37}) .6.10^6Kg = 10,695968.10^{-30} Kg

$\mathbf{m_u}$ = 5,0. 10^6 eV/c² → (17,826614. 10^{-37}). 5.10^6Kg = 8,913307.10^{-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+δ) } 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 → [y_1+y_2→ y_3]

The System Total-Harmonic-**Mass** ≡ M_T 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 Resonant-mass , M_T = 3 ,3425529 .10^{-30} Kg ….(1)

The System Total- Harmonic-Charge ≡ $Q_T \equiv 2.q_d + q_u = 2.(-1/3).e + (2/3)\,e = 0\,e$,

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 π² m $f^2{}_o$ = k , and constant law of Areas 1 = k .$\mathbf{f^2{}_o\ a^3}$. Their common k , is the Constant-Energy → k = 4 π² m $f^2{}_p=\frac{1}{\mathbf{f^2{}_p\ a^3}}$ or , $f^4{}_p=\frac{1}{4\pi^2 m a^3}$ 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 $\mathbf{E}_{2d\rightarrow u}$ = 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.($\bar{v}$ x $\bar{B}$) shows that + q charges turn Right while –q charges turn Left .

The Magnetic-fields laws for Charges and Periods are, $\mathbf{T}=\frac{2\pi.m_T}{q.\bar{B}_F}$, $\bar{B}_F=\frac{2\pi.m_T}{q.T}=\frac{|2\pi.m_T|}{Q_T}$ f

so → $\bar{B}_F=\frac{|\mathbf{2\pi.m_T}|}{\mathbf{Q_T}}\ \mathbf{f_{2d\rightarrow u}}=\frac{2\pi.[3,34255.10^{-30}]4,962072.10^{20}}{1,6022.10^{-19}}$ (Kg/Cs) = **409 .10 ^{9}** Tesla. ….(4)

From Energy-Relation W =2E= B w = J.w² , or **2E = 2π f B** then **Total -Spin*Frequency** $\bar{\mathbf{B}}\ \mathbf{f}=\frac{\mathbf{E}}{\mathbf{g}}$, and E = $\bar{S}$.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 , $\mathbf{W^-Z^o}$,** in System is the Coulomb`s Force → [d+d] > [d] ≡[$-\frac{2}{3}+\frac{1}{3}+W^-Z^o$] which may be calculated from the Time needed , for Harmonic-mass to vibrate in cave **r** , from Energy equation $\mathbf{r}=\frac{m.v}{q.B}=\frac{[3,3425529.10^{-30}\,Kg].2,9978.10^8}{1,6022.10^{-19}.[409.10^9]}$ = **1, 52911.10^{-14}** m ….(5)

and for Weak Forces **, $\mathbf{W^-Z^o}$,** in cave **d =10^{-14}** m then Period $\mathbf{T}=\frac{\mathbf{d}}{\mathbf{c}}=\frac{1,52911.10^{-14}m}{[2,998.10^8 m/s]}=$

= **5,100773 .10^{-23} s** , and The produced Energy in **d** , is → $\mathbf{E}_{W^-Z^o}=\underline{h}\ /\ T=$

$\frac{1,055.10^{-34}\,J.s}{2.[5,100773.10^{-23}s].[1,602.10^{-19}J/eV]}$ = 6,4554113.10^6 eV≡ **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] x **Cave** [r] = **Voltage** [V_C] → so Weak-Forces $\mathbf{W^-Z^o}$= $[\frac{\mathbf{E}_{W^-Z^o}}{r}]=\frac{6,4554.10^6}{1,52911.10^{-14}}$ = **4,22141.10^{20}** eV ....(7) or from Weak-Forces

$\mathbf{W^-Z^o}$ ≡$[\frac{h\ /\ T}{2.r}]\equiv[\frac{h.c/d}{2.r}]\equiv\frac{h.c}{2.d.r}\equiv[\frac{\mathbf{h.c}}{\mathbf{2e.r^2}}]$ eV = $\frac{1,055.10^{-34}\,J.[2,998.10^8 m/s]}{2.\left[1,602.\frac{10^{-19}J}{eV}.[1,52911.10^{-14}]^2\right]}$ = **4,22141.10^{20}** eV

Since [d d u] Summation occupy the **Zero-Constructive-Interference** therefore is Stable and Forces (W^-, Z^o) are equal and opposite as , → [W^-+ Z^o = 0] ≡ [$\ominus \leftarrow \oplus \rightarrow \ominus$] ←

Summarizing the above and setting them in **Fluorine-Atom** then ,
a-***Proton***$\oplus\rightarrow$ mass $\mathbf{m_p}$ = 3,146.10^{-30} Kg $\rightarrow$Charge $\mathbf{C_p}$ =1,602.10^{-19} C $\rightarrow$ **d** = 9,1.10^{-15} m
b-***Electron***$\ominus\rightarrow$mass $\mathbf{m_e}$ = 9,11.10^{-31} Kg $\rightarrow$Charge $\mathbf{C_e}$ =1,602.10^{-19} C $\rightarrow$ **d** = 5,0.10^{-17} m
c-***Neutron***[$\oplus\leftrightarrow\ominus$]$\rightarrow$mass $\mathbf{m_n}$ = 3,342.10^{-30} Kg $\rightarrow$Charge $\mathbf{C_n}$ = 0 ,0 C $\rightarrow$ **d** = 7,6.10^{-15} m
The Nucleus Total-Harmonic mass $\equiv M_T$ is $\rightarrow \frac{1}{M_T} = \frac{9}{m_P} + \frac{10}{m_n} + \frac{9}{m_e} = \frac{9.10^{30}}{3,146} + \frac{10.10^{30}}{3,342} + \frac{9.10^{31}}{9,11}$
$= \frac{10^{30}}{0,3495555} + \frac{10^{30}}{0,3342555} + \frac{10^{30}}{10,1222222} = \frac{10^{30}}{1,6803072}$, and M_T = 1,680307. 10^{-31} Kg ....(1)
The Nucleus-Orbit Total-Harmonic-Charge $\rightarrow$ $Q_T = 9.q_p + 9.q_e + 0.q_n$ = 28,8396.10^{-19} C
and the **Resonance-System-Charge** Q_T = 2,88396. 10^{-18} C .....(2)
The frequency of the Closed-Nucleus-Orbit-System becomes from Kepler second Planetary law equation , 4 π^2 m f^2_o = k , and constant law of areas 1 = k .$\mathbf{f^2_o\ a^3}$. Their common k , constant energy k = 4 π^2 m $f^2_o = \frac{1}{\mathbf{f^2_o\ a^3}}$ or , $f^4 = \frac{1}{4\pi^2 m a^3}$ and $f = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}}$ becomes ,
$f = \sqrt[4]{\frac{1}{4\pi^2 m.a_H{}^3}} = \sqrt[4]{\frac{1}{4\pi^2 1,680307.10^{-31}(2,1127839.10^{-11})^3}} = \sqrt[4]{15,87188.10^{60}}$ = 1,995984.10^{15}H ..(3)
According to Planck E = h f = 6,62606957.10^{-34}.1,995984.10^{15} =1,322553.10^{-18} Joules
The System M_T = **masses ,** Q_T= **Charges creates a constant Magnetic-field** $\overline{B}_F = |\frac{2\pi.M_T}{Q_T}|f$
M-field $\overline{B}_F = |\frac{2\pi.M_T}{Q_T}|f = \frac{2\pi.1,680307.10^{-31}[1,995984.10^{15}]}{6,4044.10^{-18}.}$(Kg/Cs) = 3,2902905.$10^{-2}$ Tesla ..(4)
$\overline{B}_F$ = **0,003291 Tesla** $\rightarrow$ ***The Magnetic-Field Strength of a Sunspot .***
1Tesla = [N.s / C .m] = [N / Ampere .m] = [Kg /C.s] = 10^4 Gauss =10^{-3} Millie -Tesla.
For cave $\mathbf{a = \sqrt[3]{T^2/g}} = \sqrt[3]{\mathbf{1/g\ f^2}} = \sqrt[3]{1/g\ [1,995984.10^{15}]^2}$ = 2,34054021.10^{-9} m Energy equation E = $\frac{1}{a^3}[\frac{4\pi^2}{c^2} + \frac{L^2}{2m}]$ where L = the Spin S = 5,691952. 10^{-34} {Kg/m/s} , and R-mass M_T = 1,680307.10^{-31} Kg of System , c $\equiv$ 2,998.10^8 m/s . **E** = [1,825441.10^{19}] x [Σ] = [4,392086.10^{-16} +1,000000.10^{-36}] = **8,0174938.10^3 J + 2.10^{-17} J** ..... (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 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 , $\{\ \bar{c}\ .\ \boxed{\bar{f}_n}\ + \bar{c}\ .\ \mathbf{f_n}\ \}$
where , $\bar{c}\ .\ \boxed{\bar{f}_n} \equiv$ Storage $\rightarrow$ **Particle ,** $\bar{c}\ .\ f_n \equiv$ Information $\rightarrow$ **Wave** , and through Photosynthesis the conversion of the Light-Energy into Chemical-Energy.
2... Since Energy E = $\frac{1}{a^3}[\frac{4\pi^2}{c^2} + \frac{L^2}{2m}]$ = 8.10^3 J + 2.10^{-17} 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 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 $\boldsymbol{\sigma} = \frac{\mathbf{F}}{\mathbf{A}} = \frac{2\pi af}{\Phi} = \frac{2\pi a}{\Phi}[\sqrt[4]{\frac{1}{4\pi^2 m.a^3}}]$ where Action-Range a = $\sqrt[3]{1/g\ f^2}$, in order that the Generated-Molecule is Stable [89] .

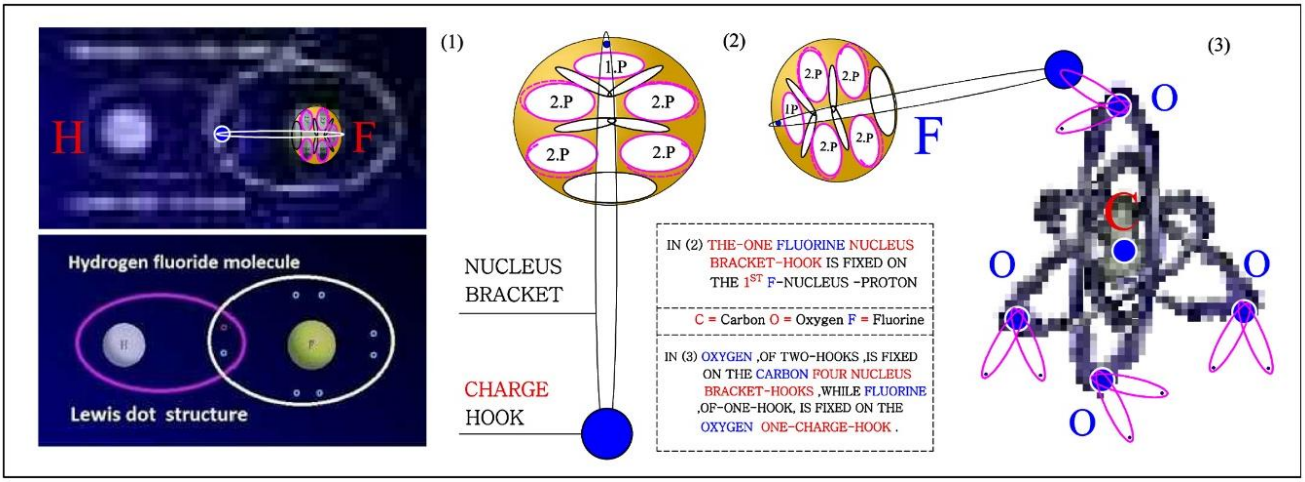


Figure – 39. The Fluorine-Oxygen-Carbon Molecule is the Strongest Molecule.

8i-1.. The Structrure of $C\,O_4\,F$.

Carbon mass → $m_C = 1{,}9888594\,.10^{-30}$ Kg → 6 Protons , 6 Electrons
Oxygen mass → $m_O = 2{,}6492848.10^{-30}$ Kg → 8 Protons , 8 Electrons
Fluorine mass . → $m_F = 3{,}1458799.10^{-30}$ Kg → 9 Protons , 9 Electrons

a.. As in Electricity issues , ***The Parallel Connections Resistors*** $\frac{1}{R_T} = [\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + ..]$ and this also , from ***Conservative-Energy-System*** motion where masses follow the equation $\frac{d}{dt}(m\dot{r}) - mr.w^2 = 0$, or motion , $\ddot{r} = r.w^2$ **,** of **The-One-mass-System**.

The ***Harmonic-Mean-Mass*** on the Center of the 3 masses is $\frac{1}{m_{2+1}} = [\frac{1}{m_1} + \frac{1}{m_2} + \frac{1}{m_3}]$

$= [\frac{10^{27}}{26{,}566} + \frac{10^{27}}{1{,}67355} + \frac{10^{27}}{1{,}67355}] = \frac{1}{m_{2+1}} = \frac{10^{27}}{0{,}811223}$, or → $m_{3T} = 8{,}112232.\,10^{-28}$ Kg

b.. From eq.(c) $f_{3T} = \sqrt[4]{\frac{1}{4\pi^2 m\, a^3}} = \sqrt[4]{\frac{1}{4\pi^2 8{,}1122.10^{-28}.9{,}45418.10^{-33}}} = \sqrt[4]{3{,}3027653.\,10^{56}} =$

$\mathbf{f_{3T}} = 1{,}3480916\,.10^{14}$ /s , which is the ***Resonance-frequency*** of $C\,O_4\,F$ Molecules .

c.. From cave-relation , **a** cave , is $a = d = \sqrt[3]{\frac{1}{9{,}808.f_{3M}{}^2}} = \sqrt[3]{5{,}6102298\,.10^{-30}} =$

$\mathbf{a}_{Fm} = 1{,}77688867.10^{-10}$ m , then **Bracket-Hook** $\mathbf{\Delta}_{Fm} = \mathbf{2a = 3,\,5537772\,.\,10^{-10}}$ m ,
and with the same measurements for Hydrogen → $\mathbf{\Delta}_H = 3{,}90253318.\,10^{-11}$ m

$\mathbf{\Delta}_C = 2a = 8{,}889927\,.\,10^{-11}$ m → $\mathbf{f_C} = 1\,,0774756\,.\,10^{15}$ H
$\mathbf{\Delta}_O = 2a = 8{,}737318.\,10^{-11}$ m → $\mathbf{f_O} = 1\,,0693626\,.\,10^{15}$ H
$\mathbf{\Delta}_F = 2a = 4{,}7983275.10^{-11}$ m → $\mathbf{f_F} = 0\,,9606715\,.\,10^{15}$ H
$\mathbf{\Delta}_{F-mol} = 2a = 35{,}537772\,.\,10^{-11}$ m → $\mathbf{f_{F-mol}} = 0{,}13480916.\,10^{15}$ H

i.e.. If 4-Hydrogens are Placed on the , **Carbon** , **4-[Bracket-Orbit-Hook]** ≡ **BOH** , then Bonding Proceeding Stops because System lacks of Positions .
IF **On Carbon - Slit - Nucleus** , (6 - 2 = 4) , of the **FOUR [Bracket-Orbit-Hooks]** $\mathbf{\Delta}_C \equiv \mathbf{2a = 35{,}537772.10^{-11}}$ m , are Placed **4 Oxygen** as 3- Oxygen **Orbit –Vectors** $\equiv \mathbf{\Delta}_O \equiv$ of Two Plane , Line-Vectors and Fixed at **Plane angle** > 90º, and On the **4th** Oxygen Vector Placed the **Fluorine ,** which is → **The ONE-[Bracket-Orbit-Hook] with One Charge edge** , ⊖ , and Energy E = U(x) , **Joint with an Positive Proton** ⊕ of **Fluorine ,** THEN CO_4F stable molecule is generated , following v-M **Elastic-Limit**. Since Hydrogen and Fluorine are both of **1-[Bracket-Orbit-Hook**] so stick together .

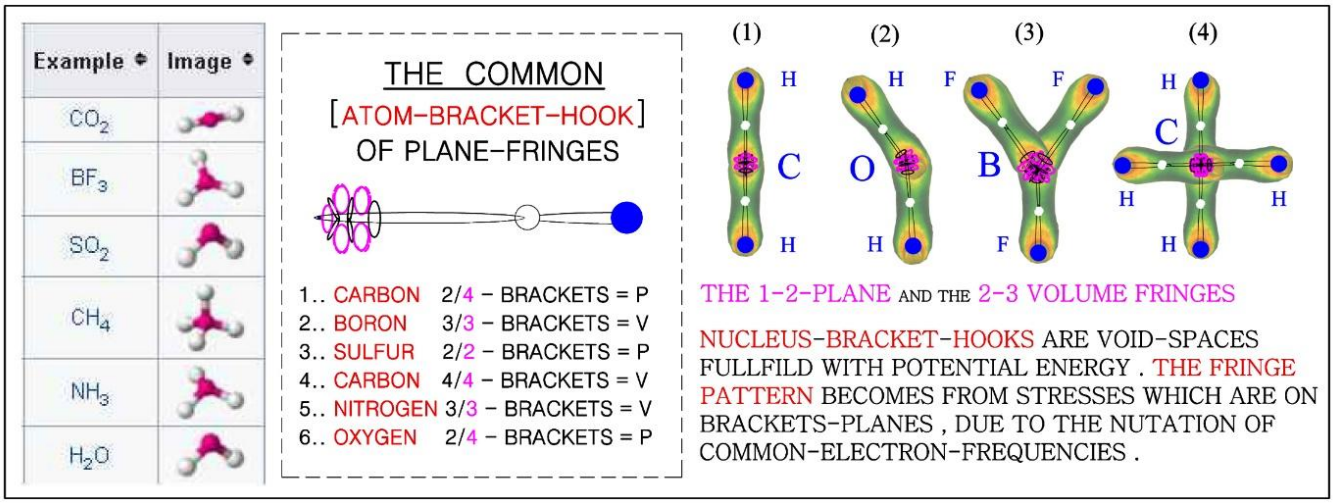


Figure – 40. The Photo Stress Fringes in Atoms-Compounds and Molecules .

9i…The Photo - Stress Method on Atoms-Plane-Brackets :

The Photo Stress Method is used to measure the ***Surface-Strains*** in any Part of an Structure . In Mechanics ,***Material-Systems*** ≡ Systems Possessing mass and Elasticity , issues Principle that of < Degrees of freedom > . The ***Configuration-Fringes-System*** consists the ***Space-Part*** and their Colors ≡ ***Principal-Stresses*** consists the ***Energy-Part*** of the System .

Since Electromagnetic waves are Polarized to→ Electric and the transverse Magnetic Fields , so their speed depends on the medium`s index 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*** $\rightarrow \sigma = \frac{\mathbf{F}}{\mathbf{A}} = \frac{2\pi r}{\Phi} f$ or from $\mathbf{f_n} = v/2\pi r = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\boldsymbol{\sigma.\Phi}}{\mathbf{2\pi.r_n}}$,→ ***and*** is Produced from the Resonance frequency f_n becoming from the Common-Electron-Nutation ≡ **CEN** .

The common-Nutation occurs on the Atoms-Compound-Bonding-Orbit , differently Brackets without electron lack of Nutation . In Fig-40. , CO_2 , 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 $U = U_o.\sin(2\pi. f_n t) = 2\pi.U_o.\sin(f_n t) = i.\sqrt[2]{R^2 + (wL)^2 + \overline{(wC)^{-2}}}$ 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 →

From the Theory of Elasticity $\varepsilon_x - \varepsilon_y = \frac{\delta}{2dK} = \frac{N.\lambda}{2dK}$ ……..(1) where ,

ε_x , ε_y ≡ The Principal-Strains of two Perpendicular directions $x \perp y$,

d ≡ The Thickness of a Plate-Surface as that of the two or four Brackets ,

K_{soc} ≡ The **Strain-Optical-coefficient** and equal to $\frac{n_x - n_y}{\varepsilon_x - \varepsilon_y}$,

$K_{\rightarrow soc}$ ≡ The **Stress-Optical-coefficient** and equal to $\frac{n_x - n_y}{2[\varepsilon_x - \varepsilon_y]}$,

n_x , n_y ≡ The Index of Refraction in , x , y , direction ,

δ ≡ The Retardation between two Waves as is , $\delta = d(n_x - n_y) = 2d.K_{soc}(\varepsilon_x - \varepsilon_y)$,

λ ≡ The Wavelength of the Electromagnetic wave ,and for White-light $=575.10^{-9}$m

The Light-Intensity is → $I = E_x^2.\sin^2[\frac{\pi.\delta}{\lambda}] = E_x^2.\sin^2[\frac{\pi.\delta}{c}].f$, and Principal-Stresses

$\sigma_x - \sigma_y = \frac{E}{1+\nu}[\frac{N.\lambda}{2dK}] = \frac{E}{2(1+\nu)K}[\frac{N.\lambda}{d}]$, and the Shear $\tau_{max} = \frac{\sigma_x - \sigma_y}{2} = \frac{E}{4(1+\nu)K}[\frac{N.\lambda}{d}]$, where

σ_x , σ_y ≡ 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 ,

$\sigma_x - \sigma_y = [\frac{K_{\rightarrow soc}}{d}]\ \bar{N} = [\frac{K_{\rightarrow soc}}{d}].[\frac{\delta}{2\pi} = \frac{N.\lambda}{2\pi}] = [\frac{K_{\rightarrow soc}}{d}].\frac{N.\lambda}{2\pi}$ ……..(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** $\bar{B}_N = 2\pi.m_e.f_N / \bar{q}_N$ as the **Resonance frequency** $f_N = [\frac{sQ}{2\pi.J_3 w}] \equiv f_R = 2{,}8398447.10^{10}\ s^{-1}$. (6e.)

The Quantum-Energy E = h $\mathbf{f_N}$ = $6{,}62606957.10^{-34}$. $2{,}839844.10^{10}$ H /$1{,}6022.\ 10^{-19}$ eV = $1{,}17444789844.10^{-4}$ 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 $\boldsymbol{\sigma} = \frac{2\pi rf}{\Phi} = \frac{w.r}{\Phi} = \frac{\mathbf{v}}{\boldsymbol{\Phi}}$, and Light-velocity c , in **Brackets-Material Plane** results the Propagating Electromagnetic-wave as → $\bar{v}\,[\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}\,] \equiv \bar{c}.[\,\boxed{\bar{f}_n}\, + f_n\,]$

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 $\boxed{\bar{f}_n}$ and as the Changing-Energy-Part $\boxed{\bar{f}_{Stress}}$ 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 , $\bar{v}\,[\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}\,] \equiv \bar{c}.[\,\boxed{\bar{f}_n}\, + f_n\,]$,

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 ≡ [**Space - Part** ≡ Principal - Strain-Fringe , as Figure] + ≡ [**Energy-Part** ≡ 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 $\sigma_z = \frac{\boldsymbol{\sigma}}{\sqrt{\mathbf{3}}}$ **,** while

For the case of the **Atoms-Brackets-Plane-materials → *Brackets*** *apriori exhibit the* Two-directions for indices $(n_x - n_y)$ and *Retardation* $\delta = d(n_x - n_y) = 2d.K_{soc}(\varepsilon_x - \varepsilon_y)$, → **Stresses** become from the **Resonance-frequency** which is created from the Nutation of the One-Electron in the Common-Orbit .

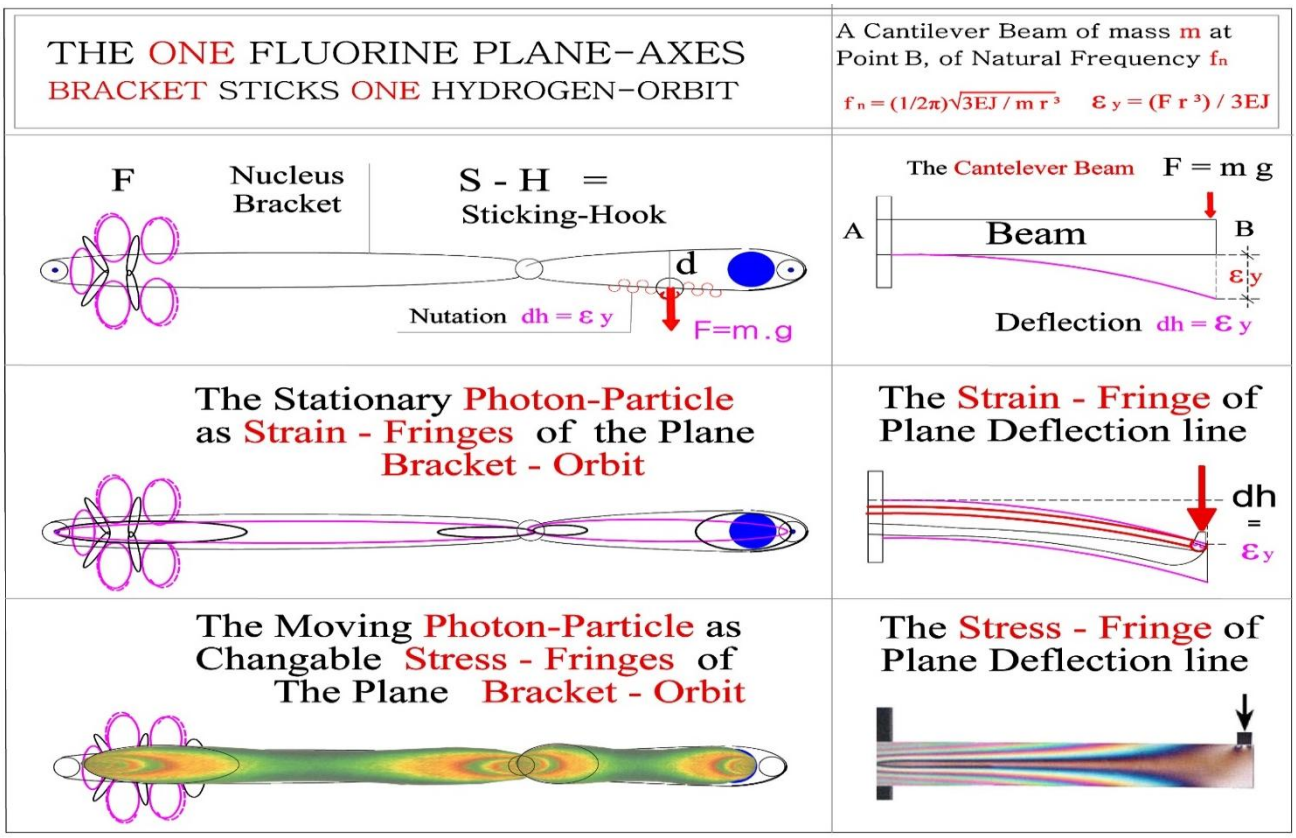


Figure – 41. The Electromagnetic-Wave $\{\bar{\mathbf{c}}.\boxed{\bar{f}_n} + \bar{\mathbf{c}}.\mathbf{f_n}\}$ in the , Atoms-Bracket-axes-Plane .

The Process of Photoelastic Fringe Pattern :

The existence of an Electron in Hydrogen-cave **r** , of thickness **d** ,creates the Magnetic field $\bar{\mathbf{B}}_e = |\frac{2\pi.m_e}{q_e}|\ \mathbf{f_e}$, dependent on Electron mass m_e , charge q_e , and frequency f_e . **Gravity** acting on Electron-mass creates force $F = m_e.g$ …(1) which in turn exhibits the Nutation of Electron which is Frequency $\mathbf{f_N} = \frac{r^2 m_e g}{2\pi.J_3 v} = 2{,}8398447.10^{10}$ H ...(2) . Nutation -frequency f_N is $f_N = n.f_1 = \frac{E}{h} = \frac{n.v}{2\pi r} = \frac{n\sigma}{4\pi r}[1+\sqrt{5}] = |\frac{\sigma.\Phi}{2\pi.r_n}|$ …(3) , and is related to Principal-stresses **σ** , And since $\boldsymbol{\sigma}_x - \boldsymbol{\sigma}_y = [\frac{K \to soc}{d}]\bar{N} = [\frac{K \to soc}{d}].[\frac{\delta}{2\pi} = \frac{N.\lambda}{2\pi}] = [\frac{K \to soc}{d}].[\frac{N.\lambda}{2\pi} = \frac{N.\,c}{2\pi.f}]$ ….(4) ***Fringes*** ,

Therefore ,

The needed Pressure on Brackets-axes-Plane for { Photoelasticity-Fringe-Pattern } is offered from the Electron-Nutation $\mathbf{f_N}$, meaning that Brackets of Electron-lack do Not Present Fringes . i.e. From (4) → $\mathbf{f_N} = n.f_1 = [\frac{N.\,c}{2\pi.(\sigma_x - \sigma_y)}] \equiv \{\bar{\mathbf{c}}.\boxed{\bar{f}_n} + \bar{\mathbf{c}}.\mathbf{f_n}\}$ results The Electromagnetic-Wave as **Dual -Photon** →$\{\bar{\mathbf{c}}.\boxed{\bar{f}_n} + \bar{\mathbf{c}}.\mathbf{f_n}\}$← **On**-which The Stationary-Part → ***is the Geometry-Fringe-Pattern*** ← and The Changeable-Part → ***is the movable and Changeable-Colors-Fringe-Pattern*** ← in the Geometry-Shape.

In (1) is shown the Stationary 2D - **Space-Part** which is ***The-Strain-Fringe-Pattern*** and is the **Particle-Photon** → $\bar{\mathbf{c}}.\boxed{\bar{f}_n}$ ← or $\bar{\mathbf{c}}.\boxed{\bar{f}_n}$ = wr $f_1 \equiv \boldsymbol{\sigma\,\Phi}.\mathbf{f_1}$, 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** → $\bar{\mathbf{c}}.\mathbf{f_n}$ ← or $\bar{\mathbf{c}}.\mathbf{f_n}$ = c.c $f_n \equiv \mathbf{c}.\boldsymbol{\sigma\,\Phi}.\mathbf{f_1}$, i.e. the movable and Changeable-Colors , *In the Shape* , of the Stationary-Fringe-Pattern.

The Generation of ***Electromagnetic–Radiation is the in-monads frequency-equation*** as , $\sin\frac{w.l}{c} = \sin\frac{2rw}{v} = 0$, satisfied by $\frac{2rw}{v} = \pi, 2\pi, 3\pi, , , \mathbf{n}\pi$, where ***Each , n , represents a Normal-Mode-Vibration-in monads*** , with Natural frequency determined from equation of ***Natural frequency*** → $f_n = \frac{\mathbf{n}}{\mathbf{2}.l}c = \frac{\mathbf{n}}{\mathbf{2}.l}.\sqrt{\frac{T}{\rho}} = \frac{\mathbf{n}}{\mathbf{2}.l}\sqrt{\frac{\sigma}{\rho}} = \frac{\mathbf{n}}{\mathbf{4r}}\sqrt{\frac{\sigma}{\rho}} = \frac{\mathbf{n}}{\mathbf{4r}^3}.\sqrt{\frac{(1+\sqrt{5})^2\sigma^2}{4\pi^2 r4}} = [\,n\frac{\sigma(1+\sqrt{5})}{\pi\,(2r)^3}\,]$ which is the index of Resonances .

EIGEN –VALUES ≡ RESONANCES

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 ≡ f_1 , f_2 , f_N ,$f_n = w^2$] ← 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 equations of motion for the **Un-damped N-DOF System** is written as $M.\ddot{x}(t) + Kx_{(t)} = 0$ for initial conditions $x(0) = x_o$ and $\dot{x}(0) = \dot{x}o$, 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 $[- w^2 M + K]\ \mathbf{u} . e^{iwt} = 0$ where **u** , is the constant scalar displacement-vector and

w = 2πf , the frequency of the System. The solution of the above equation determines the *Real or Complex numbers* , λ_1 , λ_2 , … $\lambda_n = w_n^2$, the called ***Eigenvalues*** , which satisfy the ***Characteristic equation*** det **K= [A** - λ **I**] **x** = **[A**-w^2.**I]** **x** = 0 where , **x** , is the eigenvector associated with the eigenvalues **λ = w²** , and the corresponding Non-zero vectors .

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 – λ 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 , (λ - λ_1).(λ-λ_2) … (λ-λ_n) = 0 and for λ = 0 then → det A = λ_1 . λ_2 … λ_n = 0

3..The Operator associated with Energy is Euler`s or Lagrangian and the Operator on the Wave-function is Laplace or Lagrangian equation.

Systems with N-DOF , *Degrees Of Freedom* :

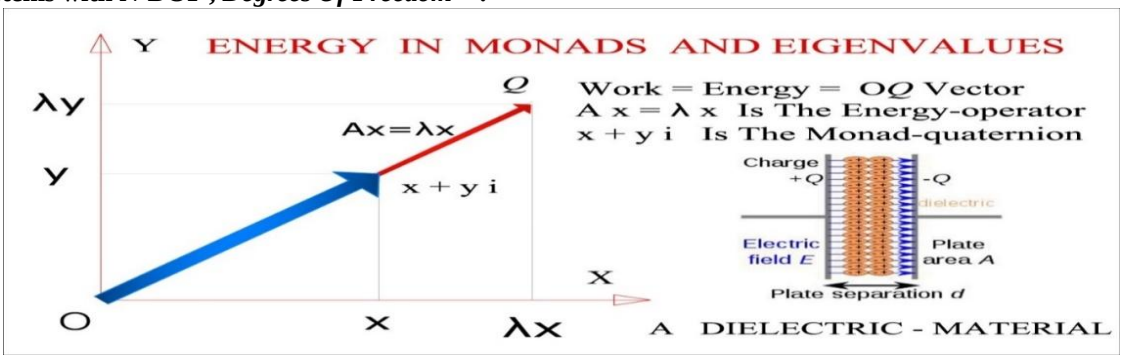


Figure – 42.

The ***Eigenvalues λ , in Energy monads*** :

a.. Monad is Quaternion [x + iy] and Energy the Vector $\vec{OQ}$ = {λ}.X

b.. Energy is the Work produced in monads and equal to W = 2L = $\bar{B} . \bar{w}$ = J . w^2

c.. The Configuration of a Stationary-System is expressed by the matrices $M.\ddot{x}(t) + Kx_{(t)} = 0$

d.. The Characteristic matrix K = [A – λ I] gives the **n** , roots such that det. A = $\lambda_1 . \lambda_2 .. \lambda_n = 0$

e.. Energy in Store 2λ= r = h/p ≡[f_1 ,f_2, $f_n \equiv$ n lobes] follows the *Stationary-Wave -Nodes-Principle.*

f.. Dielectric-medium is an Electric-Insulator that is Polarized by an, *applied or internal*, Electric-field .

g.. 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 $\lambda_N = \frac{2r}{n} = \frac{4\pi r c}{n\sigma.(1+\sqrt{5})} = \frac{8 r^2 c}{n\sigma\bar{B}}$ following the relation

$\lambda = c / f$, $f_N = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{n\sigma.\bar{B}}{8 r^2}$ and

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 .. $\dot{q}_1$, $\dot{q}_2$, $\dot{q}_3$, Potential Energy U(q_1 , q_2 , q_N) , and ***Work expressed in terms of Generalized-coordinates*** as Lagrange- equation ,

$\frac{d}{dt}\left(\frac{\partial T}{\partial \dot{q}_i}\right) - \frac{\partial T}{\partial q_i} + \frac{\partial U}{\partial q_i} = Q_i$ ……….(1) 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 $\delta W = \sum Qi.\delta q_i = Q_1\delta q_1 + Q_2\delta q_2 + \ldots$, 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 : [⊕↻↺⊖] , |⊖↔⊕|

C.. The Forced-Material-Point : M-Geometry : f_E [S ≡ $f_{1=N}$, f_2 , f_3 , f_n= w²] ← $f_E \equiv f_N$

D.. The Forced-Nodes -Structure : Mechanics : [-λ M + K] X = 0 [$\overline{A}$ – λ I] Y = 0

E.. The Valence-Bond-Particles : Chemistry : ® ® , ® ⊙® ®☼ ,⊙⊙⊙® ϴ , ® ® ® ® ® ®

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* , ⊕ , *Anti-spaces* , ⊖ , 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* , ⊕ , *Anti-spaces* , ⊖ , or (+) , (-) charge and consist the System.

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 ≡ $f_{1=N}$, f_2 , f_3 , $f_n = w^2$] ← 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 Quaternion z ≡ $s + \overline{v}\nabla i$, **ACTING** , another Quaternion z` ≡ $s` + \overline{v}\nabla i$ with Real and Imaginary Parts **OCCURS** , *a Relationship* , *a Resonance* , between these , and is described by their common ***Natural - frequency*** f_N ,mean-while motion in response to ***Imaginary parts***.

b.. Since monads are of Quaternion and of Wave-nature-Pattern Resistance is the mass , i.e. a ***Measure of any Reaction to motions*** and of , *Real* and of *Imaginary Part* as $R_z = R_s + R_{\overline{v}}$. 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 Inductance in Electric circuit , In M-Point **mass** m = $\frac{2}{c^2}$ (wr)³ = $\frac{h.w}{2\pi.c^2} \equiv \frac{2E}{a_a} \equiv [\frac{\overline{B}.\overline{w}}{\overline{B}x\overline{w}}]$ .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 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= $[\frac{4\pi r^2}{3}].f_n = n\frac{(1+\sqrt{5}).\sigma r}{3} = 2L = \bar{B}.\bar{w} = J.w^2$, is split into the , n , finite numbers of Energy-lobes dependent on the Angular-Momentum-Vector $\bar{B}$ ≡ Spin . Reorientation of Spin creates a New Nutation-Period $f_N = n\frac{(1+\sqrt{5})\sigma\, r}{3}$ as in Fig-41 , a New

wavelength $\lambda_N = \frac{2\,r}{n}$, where $\lambda = 2r$. Since frequency $f_N = n\frac{(1+\sqrt{5})\sigma .r}{3} = \frac{\lambda_N}{c}$ then ,

$\lambda_N = \frac{8.r\,c}{n\sigma^2.(1+\sqrt{5})}$, 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 $\mathbf{f_T}$. 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 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.

In Momentum-Paradox of light , **MP-*Light-Resonance*** occurs , when the Photon as System S , as { [S ≡ EM-R ≡ $f_{1=N}$, f_2 , f_3, f_D ,,f_n] and $\lambda_N = \frac{8.r\,c}{n\sigma^2.(1+\sqrt{5})} = \frac{8\,r^2 c}{n\sigma\bar{B}}$] } , *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 = $\bar{B}$ vector changes direction , then frequency is between [f_1,.., $f_n = w^2$] and becomes another Particle . [68] .

A light-Pulse , Driven forward , in a sort of Optoelestic shock-wave , E.M-R ≡ $f_{1=N}$, f_2 , f_3, f_R ,,,,,,f_n , *Electromagnetic-Radiation* , then Photon`s momentum

$$\bar{B} = \frac{r\sigma.(1+\sqrt{5})}{n} = [\frac{\sigma.(1+\sqrt{5})}{2}]\frac{2r}{n} = v_R.\frac{2r}{n} = \frac{2rc}{n.N_R} \quad \text{i.e.}$$

Photon momentum follows the Inverse-dependence of the Radiation-Pressure on the Refractive-Index .

From equation $f = \frac{\sigma\,(1+\sqrt{5})}{4\pi r} = \frac{n.\pi\sigma.\bar{B}}{8\,r^2} = \frac{n.\pi\sigma.}{8\,r^2}\frac{2rc}{n.N_R} = \frac{\sigma.\pi c}{4r.N_R}$ 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* $\bar{\mathbf{v}}$, that of change of velocity Vector and it *is acceleration* $\mathbf{d}\,\bar{\mathbf{v}}$, 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 / d t = the velocity and → d^2x / dt^2 = the acceleration of monad ,

The Second-order differential equation excited by a Harmonic external force $\mathbf{F_t.sin\ wt}$ is ,

$$m\frac{d^2x}{dt^2} + c\frac{dx}{dt} + k\,.\,x = F_t \sin wt \qquad \text{and ,}$$

corresponds Physically to the free damped vibration , for m , c , k constants , with general solution given by the equation $\mathbf{x} = A.e^{s1.t} + B.e^{s2.t} + X\sin(wt-\varphi)$ …(1) . where also $\mathbf{x} = ds$

The analogous in an RLC circuit , oscillating at its natural frequency is as , $L\frac{d^2q}{dt^2}+R\frac{dq}{dt}+\frac{1}{C}q = \mathbf{E_t\ sin\ wt}$, where the , L , R , C , constants define the , m , c , k , constants .

In Electromagnetism , *Change* , say a Space- monad is → 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 (±) 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 $V=\frac{E}{q}=\frac{q}{C}=L\frac{di}{dt}=R\,i$,

$$L\frac{d^2q}{dt^2}+R\frac{dq}{dt}+\frac{1}{C}q = E_t\ \sin wt\ , \qquad \text{where current } i=\frac{dq}{dt}\ ,$$

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

$\mathbf{q} = A\,.\,e^{s1.t} + B\,.\,e^{s2.t} + X\sin(wt-\varphi)$ ……(2) where also $\mathbf{q} = C\,(U_1 - U_2)$

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 $|\bar{v}|^2 = |\bar{v}x|\mathbf{x}|\bar{v}|y$ validating in clashed inherent vibration Particles .

Potential Energy is as the Voltage and occurs from Cross–product velocity v_x , v_y couple-components $v_x(r)$, $-v_x(r)$, on radius of curvature $\boldsymbol{\rho} = 4r\cos\varphi$, and from the transverse Centrifugal velocity Couple $v_y(r)$, $-v_y(r)$, the Magnetic Voltage .

Since $\boldsymbol{\rho} = XX` = 4r.\cos\varphi$ 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* , and this because of the Geometry- Mechanics relation .

Spin is the Resultant of Plane system of $\bar{\mathbf{S}}x$, $\bar{\mathbf{S}}y$, vectors into v_x , v_y axis which follows the Cross- product , and is composed to vector $\bar{\mathbf{S}}$ acting on breakage NN axis as a 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 Figure -12 **,** 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 $XX` = \rho = 4.r.\cos\varphi$ , which depends on angle φ , *is following a cosine`s curve* , and it is at N,N Points , where for $\varphi = 90^o$, then → $\rho = 0$ and for the extrema case at $\varphi = 270^o$, then → $\rho = 2\pi.r$, 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* $\bar{V}x(\tau) = c.\sin\varphi$ depends on angle φ , *following a sinus curve* , it is at N , N points , where $\varphi = 90^o$ and $\varphi = 270^o$, $v_x(\tau) = c$ and at middle points O , O`, where $\varphi = 0^o$, → $v_x(\tau) = 0$. It is continually equilibrium with the opposite velocity $-v_x(\tau)$.

The Changeable , *Tangential Velocity* $\bar{V}x(r)$, creates *Spin vector* $\bar{S} = 2rc.\sin2\varphi = 4rc.\sin\varphi.\cos\varphi$, depending on angle φ , *following the sinus curve* 2φ , and instantly at N , N points , *where* $\varphi = 90^o$ *and* $\varphi = 270^o$ `, which is the extrema case → $\bar{S} = 2\pi r.c$, and after this immediately becomes zero until angle $\varphi = 2\pi/5$ accepting the maximum value → $\bar{S} = 2r.c$.

At middle points O , O`, where $\varphi = 0^o$, then spin $\bar{S} = 0$ even if $\rho = 4r$.

Since ***Spin* = *Torque*** = $[\bar{\mathbf{S}}x]x[\bar{\mathbf{S}}y] = v_x(\tau).\rho.\sin\varphi$ = 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⊥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 Vx(τ) ,-Vx(τ) , Vy(τ) ,-Vy(τ) is a Centripetal force making monad to move in a circle or a helix as equation C - F = mv**x**w = - (wr)².v**x**H= -(wr)³**x**H . 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 $W = \frac{1}{2}[\varepsilon E^2+\mu H^2]$ spread as the ***First Harmonic*** and equal to Spin $\bar{S} = 2\pi r.c$. Planck`s Energy E = h.f = (h/λ).c is equal to the Isochromatic Pattern **Fringe-order** in monad

As the difference of Principal Stresses , $\sigma_1 - \sigma_2 = (a/d).N = (a/d).n.f_1 = (8\pi r^2/3).n.f_1$,
and the Summation of their Isochromatic Quantized Fringe-order is ,

$E = \bar{S} = 2\pi r.c = [\frac{8\pi r^2 f1}{3}] . [\frac{n(n+1)}{2}] = [\frac{4\pi r^2 f1}{3}]\ n.(n+1)$ *of* the same cave $(wr)^2$.

When stress (σ1-σ2) 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
then diminishes . For n = 1 , *its the First Harmonic* , $E = 2\pi r.c = [\frac{4\pi r^2}{3}].f_1.[1]$, and for
n = 2 *the Second Isochromatic fringe Quantized* order , n , **as threes** and , $E = [\frac{4\pi r^2}{3}].f_1 \rightarrow \varphi$ trisection with Energy-Bunched variation $f_2 = 2f_1$. This is the way of Energy storing in caves

J.. EPILOGUS :

As was seen , The Frequencies 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 ± axes pass from zero The Rolling of Positive ⊕ , constituent on the Negative ⊖ , constituent , creates the Neutral Material Point which Equilibrium . ***Spin*** $\bar{\mathbf{B}}$, 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 . **The Space is Quantized as Energy-Caves** under the effect of Gravitational-force G , and **Energy is Quantized as Frequency** in **Energy-Caves**

following Kepler`s First-law of equal areas in equal intervals . **Quaternion** [(+)↻↺(-)] **is a Quantum-Mould** for Space [(+)(-)] and Energy ≡ motion ≡ Force x Displacement as [↻↺ or ↑↔↓] ≡ Standing Box $\mathbf{B_Q}$ ≡ 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 $[r + \bar{v}\,\nabla i\,]^{1/w} = \mathbf{e}^{-\mathbf{i}.(\pi/2+2k\pi).w}$, is created the **min-Space ≡ cave r** = $\mathbf{1{,}07.10^{-7}}$ m and the **min-Energy** ≡ $\bar{v}$ = w r = 2πr **f** , as frequency $\mathbf{f_m = 2\,,839844\,.\,10^{10}\,H}$.

Gravitational-force **G** effecting on light velocity $\bar{\mathbf{c}}$ creates Electron-charge $\bar{\mathbf{q}}$ and Electron $\bar{\mathbf{e}}$, while acting on Planck`s-cave the Gravity **g** ≡ ± σ , as **G** = g k = $\mathbf{k_E}$ g = $\mathbf{k_L}$ σ = g.g_L k_L , and $\bar{\mathbf{c}}$ effecting on the min-Planck-cave in L_P formulates Hydrogen-cave **H** with its electron H_e . **Constant G** is effecting on **Gravity g** and in turn **g ,** effects on Electron $\bar{\mathbf{e}}$ of ***Hydrogen-cave*** **Originates Nutation-motion** in Precession as Resonance-frequency $\mathbf{f_N} \equiv \mathbf{f_R} \equiv$ **Work ≡ Energy**, and is stored in the [Nucleus-Electron] **Orbit** , as the $\mathbf{w_L}$ Larmor – frequency giving Photos everywhere from Atom-size 10^{-16} m . Moreover

[A]..The **Link** between **G** and all above is the Duality-Photon [**Particle &Wave**] which as Particle is an Confined $\mathbf{f_N}$, in a ***Stationary-*** **n, frequency -Wave-*Storage*** , and as Wave an Propagating ***Electromagnetic-Wave*** .

[B]..**Atom is** a **Cave** containing a **Heap of masses and Charges** .This configuration **forms a Harmonic Oscillator** which creates an **Electromagnetic Wave** ,the **Quantum of Energy and Space ,**which are the **Natural-frequency of Atom** $\mathbf{f_1}$ **,** and the **Storage** of Magnetic-field $\bar{\mathbf{B}}_\mathbf{L}$.

[C].. **The United Coulomb-Newton-Law** for **Interactions ,** is the Extreme case of any two Touched Charges in Field **E** ,as $k[q_1.q_2] = g\,E$ **,** Producing the Nutation of Orbit-Electrons . Elementary Particles Become from Permutations of the three Elements , ⊕ , ⊖ , ∅ , in Sub-Space , and Interact in STPL Voltage-Points P , D , with Forces the ***Wave-Constructive*** and ***Destructive-Interference Placed*** ⊕ Space and ⊖ Anti-Space , at the Two nodes of the ***Standing-waves-Wavelength*** . The Relation of frequencies and Stresses become from the Eternal-motion of the Opposites which are the only Elements of this cosmos , which Drive us to the Energy - Space Constructions of everything existing in Objective - Reality .It was done

an effort to frame the all Document in Classical Mechanics so that the Reader can understand the Deep-meaning of equations ,because that we call **Nature follows The Material Geometry and its Rules .** Electromagnetism in M-Geometry becomes from the One-Force of Energy-Space-Universe and which is that of Newton`s Gravitational-Constant G only.

[D].. **The Photo-Stress Method** applied on the Two Glue Elastically-Plane-Material-Brackets occupy an Precise-Resonant-frequency becoming from the difference of Stresses related to the Nutation-frequency of the common-Electron . The two Nucleus-Bracket-Hooks consist a Plane of a Tuning-fork because of their different length and consequently two Indices of Refraction , which Indices define the Strain-Optical-coefficient which in turn accomplish the Strain-Fringes . The **Nutation-frequency** creates a Pressure on the System Nucleus - Bracket which in turn a Voltage across the System .That Voltage causes an ***Interior-Distortion-Fringe*** which is the **Interior-Strain-Fringe** and an ***External-Distortion-Fringe*** which is the Shape of the **Angle** between the Two-Brackets of the System . Simultaneously the System of the two masses is vibrated at its **Natural frequency** which is the ***One-mass-Harmonic vibration***.

Because of the Two different indices of Refraction Brackets , the **Dual-light is Polarized** and Its Intensity follows the **Stress-Fringe** $\sigma_x - \sigma_y = [\frac{K \to soc}{d}].[\frac{N.\lambda}{2\pi} = \frac{N.c}{2\pi.f}]$ from Nutation-Frequency $f_N = n.f_1 = [\frac{N.c}{2\pi.(\sigma_x - \sigma_y)}] \equiv \{\bar{c}.\boxed{\bar{f}_n} + \bar{c}.f_n\}$, which is Perpendicular to the Strain-Fringe $\varepsilon_x - \varepsilon_y$.

- Markos Georgallides 1/3/2020 -

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