

The Dual Quaternion Momentum as the Existing Universe & Black Holes

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ABSTRACT

The Interactions: One of the most important concept in Geometry is, distance, which is the Quanta in geometry, while in Material-Geometry the composition of Opposite, the Material-Point which is the Quanta in Chemistry and Physics. As in Algebra Zero,0, is the Master-key number for all Positive and Negative numbers and this because their sum and multiplication becomes zero, and the same on any coordinate-System where $\pm$ axes pass from zero, The Rolling of Positive $\oplus$, constituent on the Negative $\ominus$, constituent, creates the Neutral Material Point which Equilibrium. Angular-Momentum is identical with Spin and consists the First-Discrete-Energy-Monad which occupies, Discrete Value and Direction, in contradiction to the Point which is Nothing, Dimensionless and without any Direction. Quaternion $[(+)\cup\cup(-)]\equiv$ Box B_R which carries the Principal stress σ between $A(+)$, $B(-)$ which σ , as Centripetal-acceleration is the minimum Energy becoming from the in-storage AB acceleration and is equal to the Gravity Force g . Because of the Revolving and Periodic, acceleration of Gravity $g \equiv \pm \sigma$ exists as the First Energy-Box- B_R , while in the Second B_P is followed the Local-Extreme-case where Gravity $g \equiv \pm \sigma$, is altered Locally by changing the Principal-stress σ with an Local-uniform-Pressure $\rightarrow g_L \equiv g \ k = g$. [Force/Area] = G , i.e. The minimum Local - Energy acceleration is the known, Universal Gravitational-constant $G = g \ k = k_E g = k_L \sigma$, for Macrocosm and Microcosm, Obeying Newton's Laws of motion. Constant G , is the mechanism for the First-kick-Start on the Granular-Energy-monad, g , which Acts in the lightest and less-mass Particle and which is Hydrogen. The Electron-Nutation-Energy due to g effect, is the minimum frequency $f_N \equiv f_R = 2,8398447.10^{10} \text{ s}^{-1}$ and which exists in all Atoms. This Energy in Hydrogen-Cave as E-M, Conductor $\equiv$ The Pin of Atom $\rightarrow$ Plug Into their Sockets, which are the Orbit - Bracket - Hooks $\equiv$ The Hands of Atoms $\leftarrow$ i.e. The Atoms Plug with their Pins into the other Atoms-Drains = Holes, and so are Bonded. This is the Resonance frequency between all Atoms, and because Hydrogen is Common to all Atoms, so Bond to Molecules and Crystals and all other Compounds in this Cosmos. The Quaternion $\bar{w}$, $\bar{B}$, Energy-Magnitudes are the two Fundamental-motions Produced from any two Opposite $[\oplus \leftrightarrow \ominus]$ and exist as DUAL-Nature, Universe-Black Holes, as Photon Particle-Wave, & as many others.

Keywords: The Universe, what is a Black-Hole, what is the Antigravity.

A: THE STRUCTURE OF THE EUCLIDEAN GEOMETRY. [6 -12]

- a1 Point is nothing, has not any Position and Dimension, and may be anywhere in the known Space therefore, the Primary point A, being nothing also in no Space, it is the Only - Point and no-where (i.e. Primary Point is the Only Space and from this all the others). [6]

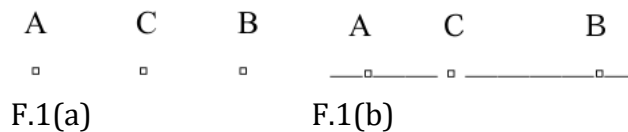
- a2 Straight line is 0, Positive, Negative, consisted of $\pm \infty$ Points which are nothing, and since it is composed of infinite Points which are filling the line, then nature of line is that of Point i.e. (the all is one for Lines and for Points).
- a3 Plane is Positive, Negative, $\pm$ Neutral lines and since Points are Imaginary lines it is composed of infinite Straight lines which are filling Plane, so then, nature of Plane is that of Line and that of Points (i.e. the all is one for Planes, Lines and Points).
- a4 Space is + Positive, - Negative, $\pm$ Neutral Planes and since Points are Imaginary Planes it is composed of infinite Planes which are filling Space, so then, nature of Space is that of Plane and that of Points (i.e. the all is one for Spaces, Planes, Lines and Points).

2a: The Fundamental Principles

2a1: The first dimensional Unit AB is of two Points A, B not coinciding which is the geometrical Shape that has as Position (the directions $\overrightarrow{AB}$, $\overleftarrow{BA}$) and as Magnitude (the length $|AB| = 0 \rightarrow N \rightarrow \infty$) $|AB|$ is a straight line through Points A, B. (F.1b), [6]

$$\downarrow$$

$$CA + CB = AB \quad \text{where,}$$



- ds = An Infinitely small increment of length AB in the direction $\overrightarrow{AB}$ or $\overleftarrow{BA}$.
- ∞ = An Infinitely great magnitude $|AB|$ in the directions $\overrightarrow{AB}$, $\overleftarrow{BA}$. Any Point
- C is on Straight line AB, only when exists the equation $CA + CB = AB$, i.e. The Whole AB is equal to the Parts CA and CB. (as equation F 1.b).

In case that $CA + CB > AB$ then Point C is not on line AB, and this is the main difference between Euclidean and Non-Euclidean geometries. In Definition 2 (a line AB is breathless length) is altered as for any Point C on line AB exists $CA + CB = AB$. Edge Points A, B not coinciding on Monad AB, keep the properties of Complex numbers with Imaginary Part which differs between the infinite Point [11]– [13] Unit AB creates Spaces with two basic Elements, The Position (which are the three directions $\overrightarrow{AB}$, $\overleftarrow{BA}$, $\overleftrightarrow{AB}$) and the Dimension (which is the Magnitude N such that $N = 0 \rightarrow |AB| \rightarrow \infty$), and when

- $A = B$ = The Principle of the Equality.
- $A \neq B$ = The Principle of the Inequality.
- $A \leftrightarrow B = \infty$ The Principle of Virtual Displacements. $W = \int P.ds = 0$, $ds = \partial W / \partial P$
- $\overrightarrow{PA} + \overrightarrow{PB} = 0$ The Principle of Stability

2a2: The Monads = Quantum = $\overrightarrow{ds} = AB / (n = \infty \rightarrow 0) = [a \pm b i] = 0 \rightarrow \infty$, are simultaneously (Actual Infinity) and also (Potential Infinity) in Complex number form and this defines, infinity which exists between all Points which are not coinciding and where ($ds > 0$), and because ds comprises any two edge Points with Imaginary part then this property differs between the

infinite Points. The Plank length is a Monad $ds = 1,62 \times 10^{-35}$, for the two Points A, B, and for the moment is accepted as the smallest possible size. Monad is also infinitely divided because edge Points A, B are not coinciding i.e.... $ds = 1 \times 10^{-N} < \infty$, where N is any number.

1. **Spaces of Unit-AB** are (in Plane) the Infinite (+) Circumscribed-Regular-Polygons on the circles with AB as Side (repetition of Unit AB) the Nth Space, the Nth Unit Tensor of the N equal finite Elements ds, and for the ∞ Spaces, the line $AB \leftrightarrow$. (Fig-1) The diameter of this circles extends to infinity (it is of Potential nature). [11]
2. **Anti - Spaces of Unit AB** are (in the three dimensional Space) the Symmetrically Infinite (-) Circumscribed- Regular-Polygons on the circles or (a Solid in Cube in Sphere with AB as side of the Solid). The Harmonic Repetition of Unit BA, symmetrical to AB) is the Nth Anti-Space, the Nth Unit Tensor of the N equal finite Anti - Elements, and for the ∞ Spaces, the Sphere through line BA. The diameter of this Spheres extends to the infinity (it is of Potential nature). [11]
3. **Sub- Spaces of Unit AB** are (in Plane) the Infinite Inscribed-Regular-Polygons in the circle with AB as diameter (are the Harmonic Repetition of the Roots in Unit AB) and in Nth Sub-Space, the Nth Unit Tensor of the N finite Roots and in case of the ∞ Elements are the Points on the circle, and for 3D-Space, the Points on Sphere AB). The Superposition of Spaces, Anti-Spaces and Sub-Space Layers of Unit AB is shown in Figure. **Remark:** (+) Spaces, (-) Anti -Spaces, ($\pm$) Sub-Spaces, of a Unit AB are between magnitude (Point = 0 = Nothing) and the Infinite magnitude ($\leftrightarrow = AB = \pm \infty =$ Infinite) which means that All Spaces exist in One Space only. Because in Spaces and Anti-Spaces, the ∞ Spaces of Unit AB is Sector $AB \leftrightarrow$, and in Sub-Spaces the ∞ Sub-Spaces of Unit AB are the Points on the circle with AB as diameter, then this ordered continuum for Points on the circle of Unit AB and on line AB shows the correlation of Spaces in Unit AB. i.e. Monads $ds = 0 \rightarrow \infty$ are Simultaneously, Actual Infinity (because for $n = \infty$ then $ds = [AB / n = \infty] = 0$, or A Point) and, Potential Infinity, (because for $n = 0$ then $ds = [AB / n = 0] = \infty$ is the straight line through AB. Infinity exists between all Points which are not coinciding, and because Monads ds comprises any two Edge-Points with Imaginary Part, then this Property is the difference between the infinite Points. [11]
4. **Neutral-Spaces of Unit-AB** are (in Plane) the Infinite Circles with AB as diameter (the Harmonic Repetition of the Roots in Unit - AB) and in Nth Sub-Space, the Nth Unit Tensor of the N finite Roots, and in case of the ∞ Elements are the Points on the circle, and for the 3D-Space, the Points on the Unit - Sphere AB). Since Spaces, Anti - Spaces and Sub-Spaces are created from Unit AB, and are Property of this Unit only, therefore these are a Restrained System (S) Presupposition for Unit $|AB| = ds$ (displacement ds) is Point A to move at the New Position B ($A \equiv B$) which means an IMPULSE (P) transfers Point A to B. Since in each Restrained System (S) the Work done (W) by Impulse (P) on a Virtual displacement ($ds > 0$) is zero, or $W = \int_A^B P ds = 0$ Therefore, Each Unit $|AB| = |ds| > 0$ exists, by this Inner Impulse (P) which means that, The Position and Dimension of all Points which are connected across the Universe and that of Spaces, exist because of this Static Inner Impulse P between A and B, on the contrary, should be one Point only (Primary-Point = Black-Hole $\rightarrow ds = 0 \rightarrow P = \infty$) Impulse $P = \infty$, and may be Vacuum, Momentum or Potential or Induced Potential and it is a Type of Effect of Push nature.

2a3: The Superposition of Plane Space, Anti-Space Layers and Sub-Space Layers

The simultaneously co-existence of Spaces, Anti-Spaces and Sub-Spaces of any Unit $|AB|$, Unit $AB = 0 \rightarrow \infty$, ($A \equiv B$) i.e., Euclidean, Elliptic, Spherical, Parabolic, Hyperbolic, Geodesics, Metric and Non-metric geometries, exist in Euclidean Model as an Sub-case within. The Interconnection of Homogeneous and Heterogeneous bounded Spaces Anti-Spaces and Subspaces of the Universe. The Unity of Opposites is also the Quantized Property of Euclidean geometry < all is one > as it is Discrete (for Monads AB) and Continuous (for Points A, B). For Primary Point A it is the only Space [17]

d-1: The Unique Case where $P = 0$ and $\Delta s > 0 = AB \rightarrow \infty$ is the Primary Neutral Space [PNS]
The Spherical connection of the same Points in PNS, is related on the influence ($P = 0 \rightarrow \overline{AB} \rightarrow \infty$) of the infinite (∞) Equilibrium Primary-Spaces and Anti-Spaces. For every Point in [PNS] exist the three Spatial dimensions (x, y, z) and the infinite dimensions of the (i) Layers at this Point existing from the other Layers (at small scale using coordinate system) of Primary Anti-Space and Sub-Space where $i = 1 \rightarrow \infty$. It has been also shown that, Every Point M of Primary Neutral Space [PNS] exists in this Space with a deficit of Impulse $P = 0 \rightarrow \infty$, due to the influence of the other Equilibrium Primary Spaces. This Property of Points in Neutral Space is the cause of their Continuously Survive. The Quantization of Points becomes through Vector Unit $d\mathbf{s} = |AB|$, and for Energy is done in bound States (loops) which withhold the diffusion (flow). The two fundamental dimensions (Quanta of Points (ds) and Quanta of Energy (dP), are connected on $|AB|$, So at any Point M exist the Impulses of all the other Spaces. All Points of [PNS] are Homogenous (i.e. all Points of PNS Space are Equivalent $\equiv$) and Isotropic (i.e. all directions, $\Rightarrow$, of AB are Equivalent) $\rightarrow [A \equiv A]$, For the Primary dipole and for Any dipole $Ai-Bi$ issues, The Position of Dipole in the equilibrium Space Anti-Space creates charge = momentum and Angular momentum (Spin = the intrinsic twist of Space, Anti-Space) which inextricably unify Geometry of Space and motion. [10]

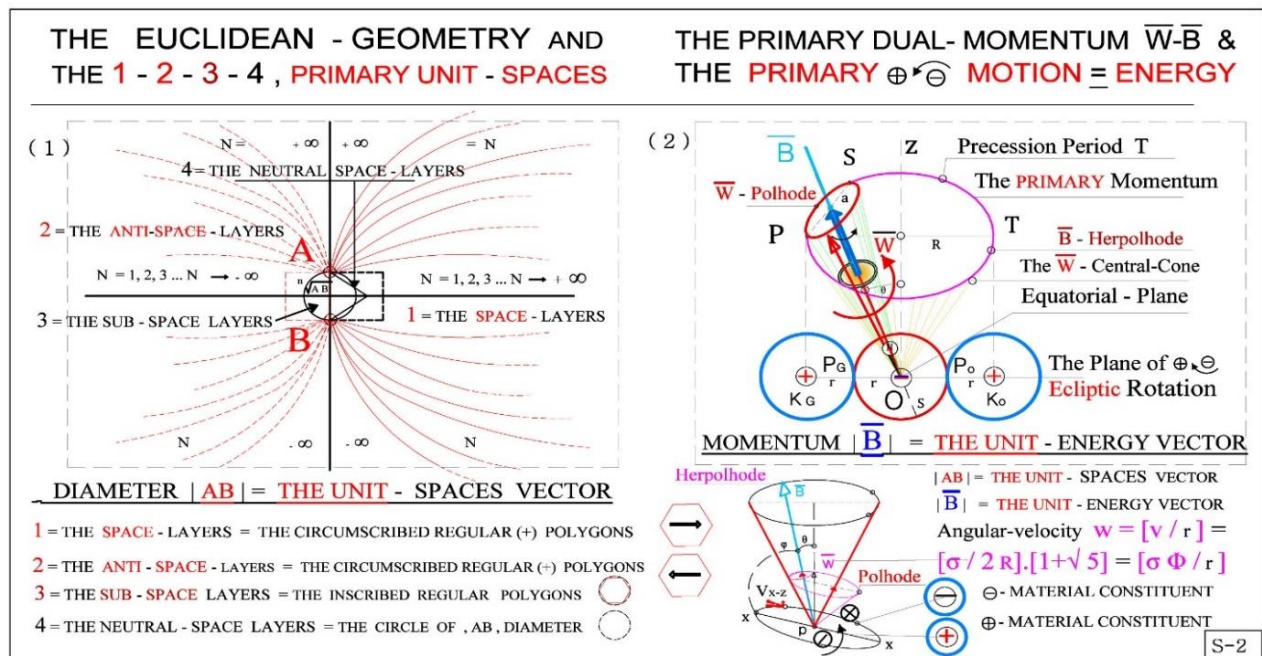


Figure 1: The 4-Primary-Spaces of Euclidean-Geometry and the Primary Rotational Quantized motion $\equiv$ The Unit-Angular-Momentum-Energy in PNS Spaces.

3a: The Quantization of the $\rightarrow \{\text{Energy} - \text{Space Universe}\} \leftarrow$

In a Conservative System the Total Energy $\equiv$ Motion is constant and the Differential equation of motion can be established by the Principle of Conservation of Energy. For the free vibration of an Undamped System, the Energy is Party Kinetic = E_K which is stored in the mass by virtue of its velocity and Party Potential = E_P which is stored in the form of Strain energy in elastic deformation, or the Work done in a Forced-Field such as gravity. Since Issues $E_K = E_P$ so and $E_K + E_P = \text{constant}$. From the theory of Vibrations, {All Systems possessing mass= m and Elasticity = $E = 1 / k$ are capable of free vibration in the absence of external excitation which is its Natural frequency of vibration = ω_n and the equation of motion is $\rightarrow \ddot{x} + \omega_n^2 x = 0 \leftarrow$ where $\omega_n^2 = \frac{k}{m}$, Gravitational force $G = m g$ } i.e. Since the Hydrogen-cave System H, as E-M Conductor, Possesses mass m_H , and light-velocity c , then vibrates IN-OUT the Space-Positions (x, y, z) of all Universe with its Natural frequency $\omega_H = \sqrt{\frac{k}{m_H}}$. or and frequency $f_H = \frac{\omega_H}{2\pi}$, and is a Wave - function providing the complete Description of the Physical Reality. From, Work = $W = \text{Force} - F_{i,j,k} \times \text{Displacement } ds_{i,j,k} = (F_{i,j,k} \times ds_{i,j,k}) = (F \times ds)$, and for the Unit of time dt , $\rightarrow W / dt = F \times (ds / dt) = (F \times \vec{v}_{i,j,k}) = \text{Power} = P$. i.e. Power $\equiv$ Force $\times$ Velocity or $(P = F \times \vec{v})$

Remarks, from Mechanics - Physics:

1. Energy $E = \frac{1}{2} m_H \cdot c^2$, or $\rightarrow 2E = m_H \cdot c^2 \leftarrow$ and Velocity = The light-velocity c ,
2. Wave length $\lambda_H = \frac{2\pi c}{\omega_H}$, and Wave Amplitude $A_H = \frac{\lambda_H}{2\pi}$,
3. Hydrogen Power $P_H = 0,5 \cdot m_H \cdot [A_H]^2 \cdot [c]^2$
4. The Hydrogen Stress-Vector σ_H is related to c as, $c = \Phi \cdot \sigma_H$
5. Since Hydrogen cave is an E-M Conductor then it is a Wave with Natural frequency, and since occupies the Property of $\rightarrow$ Atoms-Plug $\equiv$ Pin and Atoms-Drain = Hole so are Bonded $\leftarrow$ in a multi-DOF System at the Stationary Conditions.
6. To find the Eigenvalues and Eigenvectors of a multi-DOF System, Iteration method of motion is formulated by either the Flexibility Matrix $[a]$ or the Stiffness Matrix.
7. Momentum $\equiv \pm \text{SPIN} \equiv [\text{Gravity and Antigravity}]$ because velocity $\vec{c} = [\frac{G\Phi}{A}]$, Precedes That of A-Momentum $\Rightarrow \vec{B} = r m \vec{c}$. Exists Vector $B \perp r\text{-}c$ Plane.
8. Since Angular-velocity $|\vec{\omega}|$, a vector, Rotates in one axis k with respect to one variable only and this happens IN {PNS-Space, Atoms-Space, Objective-Reality and in Universe} then Quaternion - Momentum, $\vec{B}$ & $\vec{\omega}$, and $W \equiv$ Motion are Stabilized in the DUAL - TYPE, such in Microcosm, as in Macrocosm, or Both as Omnipresent.
 1. The DUAL-Momentum $\vec{B}$ & $\vec{\omega}$, as Real $\equiv$ Existing-Universe, Imaginary $\equiv$ Black-Holes
 2. The DUAL - Photon, as Real $\equiv$ Space $\equiv$ Particle and, Imaginary $\equiv \{E \Rightarrow M - \text{Wave}\}$.
 3. The DUAL - Spin $\vec{B}$, as Real $\equiv$ Space $\equiv$ Gravity and, Imaginary $\equiv \{\text{Anti} - \text{Gravity}\}$.
 4. The DUAL - Matter $\vec{B}$, as Real $\equiv$ Space $\equiv$ Atoms and, Imaginary $\equiv \{E \Rightarrow M - \text{Wave}\}$.
 5. The DUAL-Refracton of Energy as Real $\equiv$ The Space angle φ , Imaginary $\equiv \vec{v}_1, \vec{v}_2$ {The Energy $\equiv W$ from the different velocities, $\vec{v}_1, \vec{v}_2$ }.

The Results in Hydrogen - Cave:

1. Hydrogen-Cave, IN - OUT Universe occupies mass m_H , velocity $\vec{c}$, and Power P_H

2. Electron in Hydrogen-cave Precesses and Nutates due to the Gravitational constant G . The produced Work is stored in form of $\rightarrow$ Stress Energy as Hydrogen-Bracket-Hook $\leftarrow$ The Electron Precesses from the continuous and immense-communication to gravity, g . Electron-Spin is the Angular-momentum-vector $\vec{B}$ and rotates according to equation $\frac{dB}{dt}$
3. The Stationary $\rightarrow$ Tetrahedron, In-Sphere, Cube, Ex-Sphere $\leftarrow$ [92-99] construction of Atoms Permits the Space – coordinate - Structure of Atoms, The Wave-eigenfunctions of many non-commuting Physical operators as Momentum Power, from the Quantum-Mechanical description of the Physical-Reality is Complete i.e. IF-known the Physical Operators, their coordinates are simultaneous Physical reality.
4. The Interactions of Two or more Systems with known Status, can be calculated for any time by the {Carrier-Modulating-Modulated, Demodulation-Process} using Markos Program < Programming Atoms-Bonding & Their Compounds > [100,104]. SO The-All Historical Doubt of Einstein-Podolsky-Rosen for Q-Mechanics Completion VANISHES
5. The Programming of Atoms Bonding is the Quantization of Atoms -Wave -Energy to all Possible Equilibrium Positions of the $[\oplus \leftrightarrow \ominus]$ constitutes Reactions. The Wave-Energy as Vibration travels at 75-90 % of the light speed c , while the Wave-Energy in Black Holes is $n \pi c$ of the light speed. [100-101]
6. From all the Possible Reactions in Compounds, the Bonding or the Releasing of energy is the Vital rule of the Theory of Vibrations. The Program Programming the Atoms and their Compounds, analyses the Interactions of two or more Energy Systems with known Status using the $\rightarrow$ Carrier-Modulating-Modulated-Demodulation Waves Process $\leftarrow$ Some following Wave's Properties that are Defined:
 - 6a: The Equilibrium Mode – Shapes, Φ , Diagrams.
 - 6b1: The Circular – Frequencies, $\mathbf{W}_R$, in 10^{15} Hz,
 - 6b2: The Natural – Frequencies, $\mathbf{f}_R$, in 10^{15} Hz,
 - 6c: The Resultant Energy – State, $\mathbf{E}_R$, in e-Volt,
 - 6d: The Electric-Magnetic Field, $\mathbf{E}_R - \mathbf{M}_R$, in 10^{-12} Ampere - 10^{-6} Tesla,
 - 6e: The Intensity of the λ -Electric-Field, $\mathbf{I}_\lambda$, in 10^{-12} Ampere,
 - 6f: The Intensity of Magnetic-Field, $\mathbf{M}_\lambda$, in 10^{-6} Tesla,
 - 6g: The Wavelength, λ , in 10^{-10} meters,
 - 6h: The Wave Velocity, $\bar{v}$, in 10^5 meters / s,
 - 6i1: The Resultant Voltage at Wavelength-sides, $\mathbf{V}_\lambda$, in Volt,
 - 6i2: The S-Bands Voltages at Wavelength-sides, $\mathbf{V}_\lambda$, in Volt,
 - 6j: The Radius of the Helical motion, $r = \mathbf{A}_R$ in 10^{-10} meter,
 - 6k: The Total Carrier Power, $\mathbf{P}_{CT}$, in 10^{-20} Watt,
 - 6l: The Total Side-Bands Power, $\mathbf{P}_T$, in 10^{-20} Watt,
 - 6m: The Side-Bands Amplitude, $\mathbf{A}_B$, in 10^{-10} meter,
 - 6n: The Side-Bands Coefficients, $a - m$, in n-n,
 - 6o: The Modulating Phase Shift, ϕ , in Rad / 2π ,
 - 6p: The Modulating Factor, $\mathbf{m}$, in n-n,
 - 6q: The Total Energy-Status, $a - m$, in H-W,

4a: The Spaces Correlations and the Primary Motion

Euclidean Geometry Spaces occupy Position (x, y, z) and Dimension $|\uparrow\downarrow|$ at any Point P, Cauchy Stress Tensor defines the State of Stress (σ, τ) to the Traction-Vector $(T^e = e. \sigma)$ The Position of

Spaces is defined from any 3-dimension Coordinate (x, y, z) or Angular-System (φ, θ, ω) or any other System with axis from any fixed Point O.

The Dimension of Spaces is defined as the distance between any two Points O, P, and from any fixed Point O is the magnitude $|OP| = \vec{n} |OP|$, where $\vec{n}$ is The Unit Line - length direction and is identified by vector $\vec{n} \equiv |AB| = \text{The Unity Monad}$.

In Fig-1-1, On AB Diameter = $2R = \text{The Monad of Neutral-circle}$ exist the Spaces with their Sides $\lambda_n = 2\sqrt{R^2 - a_n^2}$, and their Critical-sides $a_n = \frac{1}{2}\sqrt{4R^2 - \lambda_n^2}$, as below

1. For Spaces, the Polygon Side is $\lambda_{n(S)} = 2\sqrt{R^2 - a_{n(S)}^2}$,
2. For Anti-Spaces, the Polygon Side is $\lambda_{n(AS)} = 2\sqrt{R^2 - a_{n(AS)}^2}$,
3. For Sub-Spaces, the Polygon Side is $\lambda_{n(SS)} = 2\sqrt{R^2 - a_{n(SS)}^2}$,
4. For Neutral - Spaces, the Polygon Side is $\lambda_{n(NS)} = 0$, while in Material-Geometry becomes from the Centripetal Force $F_C = \sigma = \frac{m.v^3}{r} = J \omega^2 r$, where the Unity Monad $r \equiv \text{monad } R = \frac{\sigma}{J.\omega^2} = \frac{\sigma}{\vec{B}} = \frac{\text{Stress}}{\text{Angular-momentum}}$, and Polygon Side $\lambda_{n(NS)} = 2\sqrt{R^2 - a_n^2}$ i.e. The Primary Space is Originated from the Stress $\Rightarrow \sigma$, and from the Angular Momentum $\Rightarrow \vec{B}$, Produced from the Two - Opposite $[\oplus \leftrightarrow \ominus]$ constitutes.

5a: The Origination of Primary Motion in E - Spaces

The Stress - State (σ, τ) in Spaces is defined from the Cauchy Stress Tensor where, Exists at any Point inside a material in the deformed State Placement or Configuration. The second order Tensor consists of nine components and relates a unit length direction vector $\vec{n}$ to the Traction-Vector $T_j^{\vec{n}}$ across an Imaginary Surface (in M-Geometry is Φ) Perpendicular to $\vec{n}$, $T_j^{\vec{n}} = \vec{n} \sigma$, or $T_j^{\vec{n}} = \sum \sigma_{ij} n_i$, obeying to the Tensor transformation law for Stress Analysis. A contact Force ΔF exerted at Point P of element area ΔA , the ratio $\Delta F/\Delta A$ becomes dF/dA and the couple stress vector ΔM vanishes and prior tensor becomes $T_j^{\vec{n}} = \lim_{\Delta S \rightarrow 0} \Delta F_i/\Delta S = \frac{dF_i}{dS}$. Equation means that the Stress-Tensor depends on the Position (location) in Body and the orientation of the Plane on which it is acting. From Spaces (4) in Material-Geometry of PNS -Space (Fig-1-2) the eternal Rotation of the two Opposite $[\oplus \cup \cup \ominus]$ constitutes, and because of their in between Stress σ which is equal to the Centripetal-Force then issues $F_C = \sigma = \frac{m.v^3}{r} = J \omega^2 r = \vec{B} r$, where the monad $r \equiv \text{monad } R = \frac{\sigma}{J.\omega^2} = \frac{\sigma}{\vec{B}}$ i.e. The Stress σ , which is created between the Opposite $[\oplus \leftrightarrow \ominus]$, and through the only Possible Rotational-motion, Originates the Angular-velocity $\vec{\omega} = \frac{\sigma.\Phi}{r} = 2\pi r.f$ and the Angular Momentum $\vec{B} = \frac{\sigma}{r} = \frac{\sigma}{R}$, which when Placed on AB Diameter = $2R = \text{The Monad}$ consist the Neutral - Spaces - Energy.

1c: The Rolling of Polhode Unit-Space into the Herpolhode Space-monad Cone

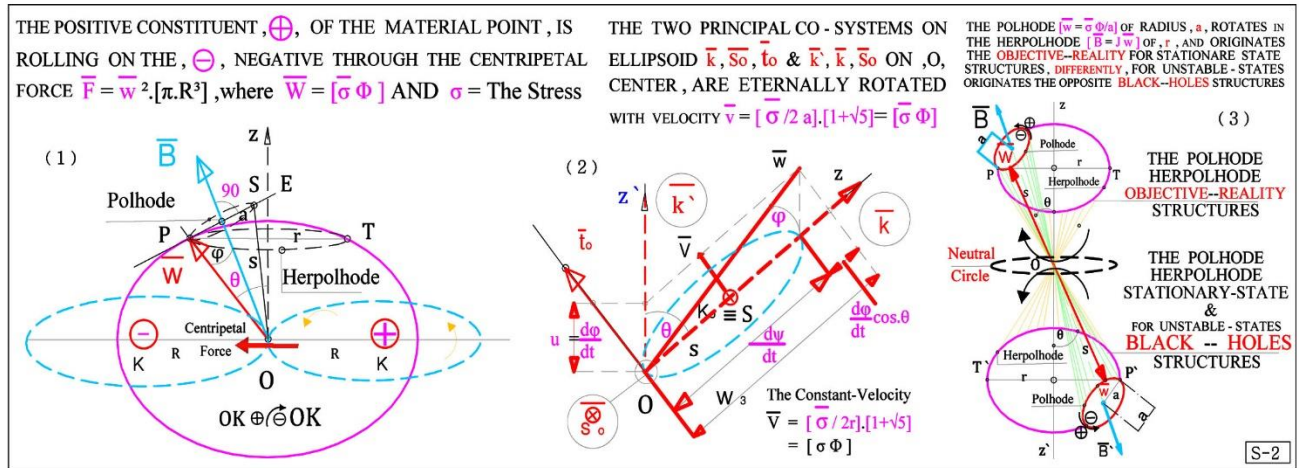


Figure 2: The Central Axial-Ellipsoid of $\oplus$ constituent Rotating through constant Point O.

In (1-2) The $\oplus$ Material Point OK, $\{\oplus \equiv O, [OK = R] \equiv \text{The Space}\}$, continually Rotates around The $\ominus$ Material Point OK, $\{\ominus \equiv O, [OK] \equiv \text{The Anti-Space}\}$, on $2R$ circle. The center of their Common circle forms the material angle $\varphi = \varphi_P \cdot t = \left(\frac{v_P}{\sqrt{c^2 - r^2}}\right) \cdot t$, CREATS at any contact Point P the Centripetal Force $\vec{F}_c = \frac{mv^2}{r} = \frac{\pi r^2}{2r} [w^2 \cdot r^2] = \frac{\pi \cdot r^3}{2} [w^2]$.

The vector $\vec{w}$ of Angular velocity w , formulates the Polhode Cone of Base-radius a , and of $OP = S$ side forming the w -angle with z axis, while the vector $\vec{B}$ of Angular Momentum B , formulates the Herpolhode Cone of Base-radius r , of $OP = S$ side and θ -angle with z axis In (3), is the MPMP Space where Time is not existing $t = 0$, and the same for motion also.

In PNS-Space the 3-dimension motion of the Primary constituents $[\oplus \cup \ominus]$ the time is as Period T , and Momentum is the Angular-velocity $\vec{w}$ and Angular Momentum $\vec{B}$, where the Momentum $\vec{B} = r m v = m \vec{w} r^2 = \pm \left[\frac{\pi \cdot r^2}{2}\right] \cdot \vec{c} \times \vec{r}$ and $\pm \left[\frac{\pi \cdot r^2}{2}\right] \equiv$ the Hemi - circle area.

The Polhode is of radius a , and rotates with an angular velocity $\vec{w} = 2\pi \cdot f_P$ in the Cone $\pi a^2 \cdot s$. The Herpolhode is of radius r , and is the Stationary Cone $\pi r^2 \cdot s$ with an angular Momentum $\vec{B} = r m v = r m (w r) = m \vec{w} r^2$. The Polhode Cone is rolling on OP and contact common line, into the Herpolhode Cone without friction. i.e. The motion in PNS-Space exists as the Rotation of Space Point P (+) on $[O, OK]$ circle Anti-Point P' (-) on $[O, OK]$ of Anti-circle and defines The Angular-momentum $\vec{B}$, so The Position of Spaces Points P (+) and Points P (-) and Momentum are simultaneously Determined and measured, consisting a direct violation of the Uncertainty Principle.

The Primary - Rigid -Body Analysis:

- The Position of the Herpolhode Cone is, $x = a \cdot \sin \theta \cdot \cos wt$, $y = a \cdot \sin \theta \cdot \sin wt$, $z = a - a \cdot \cos \theta = a \cdot [1 - \cos \theta]$ where exists, a = The Polhode Cone Base-radius, r = The Herpolhode Cone Base-radius $[x, y, z]$ = Coordinate System such that z -axis $\perp$ $[KOK]$ line, and angle - θ between OP , Oz Axis.

- b. The Energies of the Polhode - Herpolhode Cones are from Lagrange's Principle where for any Particle, The Kinetic E_K and Potential E_U Energy are measured as below,

$E_K = \frac{1}{2} m. [\dot{x}^2 + \dot{y}^2 + \dot{z}^2] = \frac{1}{2} m a^2. [\dot{\theta}^2 + w^2 \sin^2 \theta]$, and $E_U = m g z = -m g a \cos \theta$. The Lagrangian $L_{KU} = m a^2. [\frac{\dot{\theta}^2}{2} - V_{\text{EFFECTIVE}}]$, where the Effective Potential V_{EFFE} is $V_{\text{EFFE}} = -\frac{1}{m a^2} [m g a \cos \theta + \frac{1}{2} m a^2 w^2 \sin^2 \theta] = -[\frac{g \cos \theta}{a} + \frac{w^2 \sin^2 \theta}{2}]$(e) The equation of motion for the Bead becomes from Lagrangian which is $\ddot{\theta} = [\frac{\partial V_{\text{EFFE}}}{\partial \theta}]$...(b) Since θ is constant then issues $\dot{\theta} = \ddot{\theta} = 0$, and for the Bead-Herpolhode motion $\frac{\partial V_{\text{EFFE}}}{\partial \theta} = 0$..(c) Equation (c) is Stationary at Positions which satisfy relation $g \sin \theta = a w^2 \sin \theta \cos \theta$..(c1)

1. The Solutions of (c1) are at Position $\sin \theta = 0$ where issues $\theta = 0$
2. The Solutions of (c1) are at Position $\sin \theta \cos \theta = \sin 2\theta = 0$ and is $\theta = \pi$ & $2\theta = 2\pi$
3. The Solutions of (c1) are at Position $\cos \theta = \frac{g}{a w^2}$ and for $\theta = 0$ then $w^2 = \frac{g}{a}$

Remarks:

1. Solution (1) for $\theta = 0$ exists always and from Figure-2-(2) the velocity vector $\vec{v}$ is applied at the center of mass K_0 , Anti-clockwise Spinning. Fig-2-(3)
2. Solution (2) for $\theta = \pi$ exists always and from Figure-2-(2) the velocity vector $\vec{v}$ is applied at the center of mass K_0 , Clockwise Spinning. Fig-2-(3)
3. Solution (3) where since $\theta = 0$ exist the Prior and from Figure-2-(2) velocity vector $\vec{v}$ is applied at the center of mass K_0 , and the $\pm$ Spinning is very fast from the center and is such that $w^2 \geq 0$, and happening when {from relation $\frac{g}{a}$ } the radius $a \Rightarrow 0$.
4. The Solution $w^2 \geq \frac{g}{a}$, Determines the Stability of the Polhode System.
 The Solution $w^2 < \frac{g}{a}$ and $\theta = 0$, Determines Stability at Point O Position and $-V_{\text{EFFE}}$.
 The Solution $w^2 < \frac{g}{a}$ and $\theta = \pi$, Determines Stability at Point O Position and $+V_{\text{EFFE}}$.
 For Solution $w^2 > \frac{g}{a}$ and $\theta = 0$, The Position is Unstable at Point O with $-V_{\text{EFFE}}$.
 For Solution $w^2 > \frac{g}{a}$ and $\theta = \pi$, The Position is Unstable at Point O with $+V_{\text{EFFE}}$.
 Meaning the Black - Holes Origination.
 From Solutions $w^2 = \frac{g}{a}$, the $\theta = 0 = \pi = 2\pi$ Positions are Unstable and below Point O with $+V_{\text{EFFE}}$. meaning an evolving and Operational Black-Hole Stable Origination.
5. All above Stable Solutions result to the determination of the two Vector - magnitudes that of Angular-velocity $\vec{\omega}$ and that of Angular Momentum $\vec{B}$, differently Black-Hole.

Both magnitudes define the Unit-Energy Vectors $\rightarrow \{\text{Unit-E Vector } R = \frac{\sigma}{J.w^2} = \frac{\sigma}{B}\} \leftarrow$ When the Unit-E.Vector R is Placed ON $[AB \equiv 2R \text{ S. Diameter of Spaces-Neutral-circle}]$ Then Energy-Monad $|\vec{R}|$, exists on, Space-Monad $|AB| \equiv |\vec{R}|$, as $\{E+S \text{ -Monad } |\vec{R}|\}$, i.e. $\{\text{Energy - Space - Monad } |\vec{R}|\}$, where magnitudes, Spaces Sides $\lambda_n = 2\sqrt{R^2 - a_n^2}$, &, Quantum Critical-Side $a_n = \frac{1}{2}\sqrt{4R^2 - \lambda_n^2}$,

The Quantization of Energy in Spaces, happens when follow the Archimedes formula for Duplication of Sides as $\lambda_{2n} = \sqrt{2R^2 - R\sqrt{4R^2 - \lambda_n^2}}$ & Critical-Sides $a_{2n} = \frac{1}{2}\sqrt{4R^2 - \lambda_{2n}^2}$ Monad $R = \frac{\sigma}{j.w^2} = \frac{\sigma}{B}$ remains the same, while Spaces Sides change as above λ_{2n} , a_{2n} .

6a: General Conclutions

1. The Objective Reality is composed of two elements, that of Distance. The Space ds , and that of Motion, or else the called Energy, and it is the content of all sciences [32]
2. The Euclidean-Geometry describes the Space only but Not Energy which is motion [48]
3. The Solution of all the Unsolved-Ancient-Greek-Problems [50] opened the way to the Material-Geometry [54] which Incorporates the Motion $\rightarrow$ In-Space as $(\oplus \leftrightarrow \ominus) \equiv 0$, [61] The Space exists in Energy - Caves as Energy-Quantum-Quantities [39], while Motion or Energy exist in Caves as a Confined - Stationary-wave which is either Static or an moving Energy-Storage or an Energy-Box [68]. The Any-Two Opposites (+), (-) exist in Nature and are found everywhere from $\rightarrow$ Zero-Point (0) $\equiv [+ = -]$ or as $(+ A) + (- A) = 0$ in E-Geometry and $\rightarrow [0] = [\oplus \leftrightarrow \ominus] \equiv f_n$, $[\oplus \leftrightarrow ds \rightarrow \ominus] \equiv ds$ in Material-Geometry, to the aperon, $\pm \infty$ where $\rightarrow$ The Space $\equiv ds$, is the nodes distance, and motion exist as a Vibration $\leftarrow$ [52]
4. The Electron-Nutation in Hydrogen cave Produces Energy due to g effect, as an minimum frequency $f_n \equiv 2,8398447 \cdot 10^{10}$ H and thus exists in all Atoms. This Energy in Hydrogen-Cave is an Electrical -Magnetic Conductor, which is The Pin of Atom-Plug and enters Into the other Atom-Sockets, which are the Orbit-Bracket-Hooks. These are the Hands of Atoms, i.e. $\rightarrow$ The Atoms-Plug, Placing their Pins into the other Atoms-Drains $\equiv$ Holes, and so is done that what we say as Bonding of Atoms.
5. Because of the Resonance frequency between all Atoms, and because of the Common Hydrogen, so Atoms Bond by Pinning and form Molecules and all Compounds in this Cosmos. This is Possible because the Periodic-System of Atoms is NOW modulated into 4 New - Categories with Only-One Criterion, which is The Number of ($\pm$) Energy - Conductors in Atoms, related to their Stability. [70-73]
6. The first Solid (4 Points not coinciding) is The Tetrahedron, and the first Material Space for the Two elements (+), (-), are (4 x 2 = 8 Positions for Electrons) The-Cube, i.e. the Tetrahedron is Into the Cube and Into its Ex - Sphere, and this because the Circles on Tetrahedron exist on Sphere.
7. When 1-8 Electrons $\ominus$ are Placed on the Cube's Vertices, and into this Onion -System, then Automatically are formed the, 1 - 4 Energy-Conductors, where issues $[\oplus \leftrightarrow \ominus] = [p \leftrightarrow e] = [\text{Atom-Plug} = + \text{Electric Vector} \leftrightarrow - \text{Magnetic Vector} \equiv \text{Drain} \equiv \text{Hole}]$, and are the Actions between Opposite. With this New modulation [The,1, 2,3, 4, Energy-Conductors $\equiv$ Atoms-Four Fundamental frequencies], Conductors exist on System and ARE ACTIVE + as $\rightarrow$ The-Electric-Vectors $\leftarrow$ and simultaneously PASSIVE $\equiv$ Drains (-) as $\rightarrow$ The-Magnetic Vectors $\equiv$ Holes $\leftarrow$. The Zero-State Conductors are those whose 8 Cube-Positions are all filled with electrons. The Multiple - Plug-Pins Atoms can Plug all the less number Electrons - Atoms and can Be-Plugged from all the greater number Electrons-Atoms. With these Four modulations are formed all Atoms and their Compounds, these are the Mechanisms of, Water, the Cells, RNA, DNA, Cancer, and everything in this Universe.

8. In the same way, is that where an 110 Volt Refrigerator Can't-Plug into 220 Volt Socket and this because are different in construction, the same to Atoms-Plug which differ to the Number and the Length of their Pins. Hydrogen is the Multiple-Plug-Pins Atom which can Plug all Atoms and itself.
9. The New-Atom-Structure is consisted of → a) The Nucleus IN-Sphere b) The Dynamic Electro-Magnetic - Tetrahedron, c) The N-Outer- Cube, d) The Orbitals EX - Sphere.
10. In the New-Atom-Structure, the Master-Keys - Resonances are the Communications-Frequencies, either to the Atoms or to their Compounds. [89-90]

7a: The Mechanisms & Charges, For the Dual - Originations, The Natural - Spaces of AB Diameter is the $\overline{AB}$ Unit Vector

1. Spaces $\equiv$ The Infinite (+) Circumscribed-Regular-Polygons in $\overline{AB}$. [Fig-1].
2. Anti - Spaces $\equiv$ The Infinite (-) Circumscribed-Regular-Polygons in $\overline{AB}$. [Fig-1].
3. Sub. - Spaces $\equiv$ The Infinite (+) Inscribed-Regular-Polygons on Diameter $\overline{AB}$.
4. Neutral-Spaces $\equiv$ The Infinite Circles on Diameter $\overline{AB}$. (The Sphere on AB)
5. {MFMF} $\equiv$ The Gravity cave = 10^{-62} m.
6. {PNS} $\equiv$ The Planck's cave Length = 10^{-35} m.
7. Vacuum $\equiv$ [10^{-62} -- 10^{-35} m] = The in-between distance THE Origination-Mechanisms in Spaces & the Origin of Charges.
8. Action-Spaces $\equiv$ The Infinite Quaternion - monads $\rightarrow \vec{Z} = (s + \bar{v}.\nabla i) \equiv \overline{AB} \equiv \sqrt{s^2 + [\bar{v}.\nabla i]^2}$, or $\vec{Z} = x + y. i \equiv \overline{AB} \equiv$ moduli, r , is their magnitude [$r = |r| = \sqrt{x^2 + y^2}$], on Unit-Diameter $\overline{AB}$. The [QMAS], [Fig-1]. For Quaternion $\vec{Z} * \vec{Z} = (s + \bar{v}.\nabla i)^2 = s^2 + [\bar{v}.\nabla]^2 + 2.s.\bar{v}.\nabla i = s^2 - \bar{v}^2 \pm 2.s.\bar{v} = |s|^2 - |\bar{s}|^2 \pm 2.|s|.|\bar{s}|$, for $|\bar{v}| = s$
 1. The {STPL} Mechanisms in Spaces, from Charges in Under-Planck's-Length $\equiv$ The Six Triple Points Line Mechanism. Is the Mechanism on where the Charges of Opposites, $[\oplus \leftrightarrow \ominus]$, React as Centrifugal force F_c which in turn changes $\rightarrow$ (Action-Reaction $\equiv$ + Spin - Anti Spin) $\leftarrow$ of [MFMF] Space to Rotational motion Angular-velocity = $\vec{\omega}$ and Angular-Momentum = $\vec{B}$. [Fig-20].
 2. The {MTPV} Mechanisms, from Charges on Two-Perpendicular-Vectors-Edges $\equiv$ Markos Two - Vectors Three - Poles Mechanism. [Fig-8]. In Fig-8|4|, Vector $\overline{CP} \perp \overline{CA}$ Vector, which changes the Energy $\equiv$ The Stress σ of The $|\overline{CP} \times \overline{CA}|$ Square, to 2 - Halve $\pm$ Squares on Vectors-axis for Equilibrium.
 3. The {TCIC} Mechanisms, from Charges In Three-Vectors-Conductors-Edges $\equiv$ Markos Tetrahedron Cub Inscribed-Circumscribed Circles Mechanism. [Fig-11]. In Fig-8, The Tetrahedron Conductors-Vectors $\overline{DA} \perp \overline{DB} \perp \overline{DC}$, CARRY Energy as Electromagnetic-Fields (Forces-Frequencies-Stresses-any motion) TO Inscribed Sphere (Nucleus of Atoms), TO Cube Vertices (Electrons-Position), TO Circumscribed Sphere (The Electrons Orbits) for Equilibrium and for transferring Information's and Signals.
 4. The {TBOH} Mechanisms, from Charges In Two-Orbits-Pins & Drain. Markos Atoms Bonding Bracket - Hook Mechanism. [Fig-9]. In Fig-9, The $\ominus$ - Electron Precesses due to Gravity and Produces Work which is stored in a second Orbit. The 2-Orbit equilibrium exists from the Existing $\ominus$ -Electron $\equiv$ DRAIN and from the New $\oplus$ - Nucleus $\equiv$ The PIN. The 2-Orbit is The Bracket-Hook-Mechanism with which Atoms and Compounds Bond. [100-104]

5. The {QMAS} Mechanisms, from Spaces - Action ON Quaternion - monads $\overline{AB}$ is the Lagrange's Non Conservative Systems for generalized coordinates, where the System is subjected to forces that do not have Potential $d(T + U) \equiv \delta W_{NPF}$, as is the Gravitational Force G and from which are created $\rightarrow$ The Elementary Particles and all Universe $\leftarrow$ & The DUAL $\rightarrow$ The Black - Holes $\leftarrow$ as equation $\delta W_{NPF} = \sum_{i=1}^N Q_i \cdot \delta q_i$, [Fig-2,16,17].

B: THE E - GEOMETRY & THE ENERGY CAVES.

1b: The Golden Ratio Pattern Φ and Its Functions

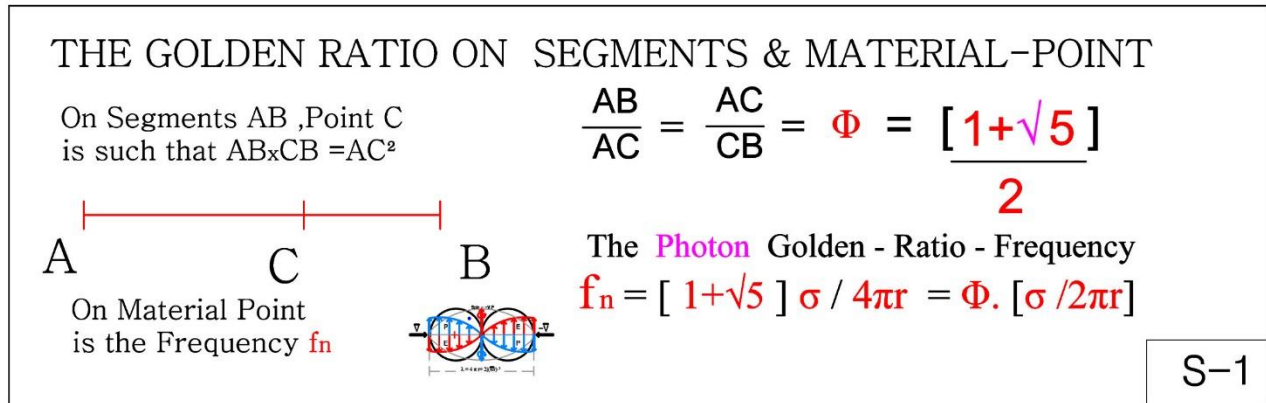


Figure 3: The Physical explanation of The Golden-Ratio Φ , in Universe :

In figure, AB line-Vector is divided by Point C such that $AC = \frac{AB}{2} [\sqrt{5} + 1] \dots (1)$

Proof:

According to the definition of Mean ratio exists $AB / AC = AC / CB$, or $AC^2 = AB \cdot CB = AB \cdot [AB - AC] = AC^2 = -AC \cdot (AB) + AB^2 \rightarrow AC^2 + AC \cdot (AB) - AB^2 = 0 \dots (2)$

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

The Physical meaning becomes from Mechanics where, when a force P acting on a surface S of a differential volume ds^3 , then Principal stresses σ_1, σ_2 , and Shear stresses τ_{12} are as equation $\sigma = \sqrt{(\sigma_1 - \sigma_2)^2 + 4\tau_{12}^2}$, and $\sigma_{1,2} = (\sigma_1 + \sigma_2)/2 \pm (\frac{1}{2}) \sqrt{(\sigma_1 - \sigma_2)^2 + 4\tau_{12}^2}$, where $\rightarrow \tan \theta = 2 \cdot \tau_{12} / (\sigma_1 - \sigma_2) \dots (3)$ When the surface becomes a Point [This is the Extreme case where surface is interchanged as line or 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 is in cross-Product to a right-handed coordinate system where exists $\sigma_2 = 0$ and $\tau_{12} = \sigma_1$, then equation (3) becomes, $\sigma_{1,2} = \sigma_1 / 2 \pm (\frac{1}{2}) \cdot \sqrt{\sigma_1^2 + 4 \cdot \sigma_1^2} = \frac{\sigma_1}{2} \cdot [1 \pm (\sqrt{5})] = \frac{\sigma}{2} \cdot [1 \pm (\sqrt{5})] \dots (4)$ Equation (4) denotes the way that Stresses $\sigma_{1,2}$, are shaped on any Volume according to the Principal Stress σ , and which is the Golden-ratio $\Phi = \frac{\sigma}{2} [1 \pm (\sqrt{5})]$ of Stress σ . Since also Stress σ

eternally exists in Material - Point and is of the Golden-ratio-Pattern Φ , therefore microcosm and sequence all macrocosm follows the Stress σ , Property Vector as $\{\sigma \Phi\} \equiv [\frac{2B}{\pi r^3}] \equiv 2\pi \cdot \mathbf{f_p} \cdot r \equiv w$
 $r \equiv \bar{v} \equiv m \cdot a = m \cdot g = \bar{c}$, and The Growing-Golden -Ratio-Pattern Φ , in all cases of motion 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 $\mathbf{f_p}$, occupying the Growing - Golden-ratio Pattern Φ give the analogous Strength to enter in caves, and incidentally in Satiation Systems to follow the Split -Property as this happened to the Organic - Chemistry and Medicine.

The Φ Properties:

To show that $\Phi = 1 + \frac{1}{\Phi} = 1, 6180339887$: The Proof, It is holding $\rightarrow 1 + \frac{1}{\Phi} = 1 + \frac{1}{[1+\sqrt{5}]/2} = 1 + \frac{2}{[1+\sqrt{5}]} = \frac{2[\sqrt{5}-1]}{[\sqrt{5}+1] \cdot [\sqrt{5}-1]}$ or, $1 + \frac{1}{\Phi} = 1 + \frac{2[\sqrt{5}-1]}{4} = 1 + \frac{[\sqrt{5}-1]}{2} = \frac{2+\sqrt{5}-1}{2} = \frac{[\sqrt{5}+1]}{2} = \Phi$, therefore, $\Phi = 1 + \frac{1}{\Phi}$ (5)

Equation (5) is an very Interesting Property of the Golden - Ratio because is such that, it can be Defined in terms of itself, i.e. of unit 1 equal to a new Φ which defines the Space and from $\frac{1}{\Phi}$ define the Opposite which is The Anti-Space, where both still. as continuous fraction is, $\Phi = 1 + [\frac{1}{1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{\ddots}}}}]$ (6)

Because number Φ , multiplied with its Reciprocal number $\frac{1}{\Phi}$, is process of Addition, and equal to unit 1, so $\rightarrow$ Space * Anti-Space $\equiv$ Monad $\leftarrow$ 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 $\Phi^2 = \Phi + 1$ (7)

Equation (7) is written as, $\Phi^2 - \Phi - 1 = 0$, and the roots of the second degree equation is $x = \frac{\Phi}{2} \pm \frac{[\sqrt{(\Phi^2+4\Phi^2)}]}{2} = \frac{[\sqrt{5}+1]}{2} \cdot \Phi = \Phi * \Phi$ 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 $\rightarrow$ The Two-Opposite-Rotational-Energies $[\cup \pm \cup] \leftarrow$ as relation $\bar{B} \cdot \bar{w} = L = \frac{1}{2} J_1 w_1^2 + \frac{1}{2} J_2 w_2^2 + \frac{1}{2} J_3 w_3^2$, or Angular-momentum $B \equiv \pm$ Spin S as, $\bar{B} = \frac{J \cdot w}{2} = \frac{\pi r^4}{4} [2\pi f] = \frac{\pi^2 r^4}{2} [f] \equiv [\text{Constant} * f] \equiv \frac{2L}{\bar{w}} = \frac{2L}{2\pi f} = [\frac{L}{\pi}] \cdot [\frac{1}{f}] = \frac{4r \cdot L}{(1+\sqrt{5})\sigma}$, or $\bar{B} = \frac{4r \cdot L}{(1+\sqrt{5})\sigma} = \frac{2r \cdot [L=hf]}{(1+\sqrt{5})\sigma} = \frac{hf}{2\pi f} = [\frac{h}{2\pi}] \equiv \text{SPIN}$, where $L = h f = \text{Constant} \cup \cup$ and

Frequency related to Φ is $\rightarrow \mathbf{f}_n = \left[\frac{2}{\pi^2 r^4} \right] \cdot \bar{B} \equiv \left[\frac{1+\sqrt{5}}{2} \right] \frac{\sigma}{2\pi r} \equiv \left[\frac{\Phi \sigma}{2\pi r} \right] \dots (7a)$ From Energy-relation $2E = J \cdot \omega^2 \rightarrow \bar{B} = J \cdot \omega^2 / 2 = \left[\frac{\pi r^4}{2} \right] \cdot 4\pi^4 \cdot f \cdot [\sigma \Phi / 2\pi r] \equiv \{ \pi^4 r^3 \cdot \sigma \cdot \Phi \} f \leftarrow \dots (7b)$

The frequency which Occupies the Property of the Golden-Ratio-Pattern Φ , and equation (7) (7a-7b) defines that Material Point of frequency $\mathbf{f}_n$ when collide with another Material Point or with another Particle or Particles, then M-P Produces another monad as the ONE $\rightarrow 1 \equiv$ New Quaternion and first continuous to be of the same Identity, frequency $\mathbf{f}_n$ as before and from Euler's rigid body dynamics, $W = 2L = \bar{B} \bar{\omega} = J \omega^2 \equiv h \cdot \mathbf{f}_n \equiv \left[\frac{h \Phi \sigma}{2\pi r} \right] = \{ \pi^3 r^3 \cdot \sigma \cdot \Phi \}$, i.e.

The Photon's Frequency, is embodied with the $\rightarrow$ Growing-Golden-ratio-Pattern $\Phi \leftarrow$ And Uses The Vibrating Physical Structures, which are the Granular Material-Instruments, to Kick Start all of them and everything in this World. The How is shown in [86],

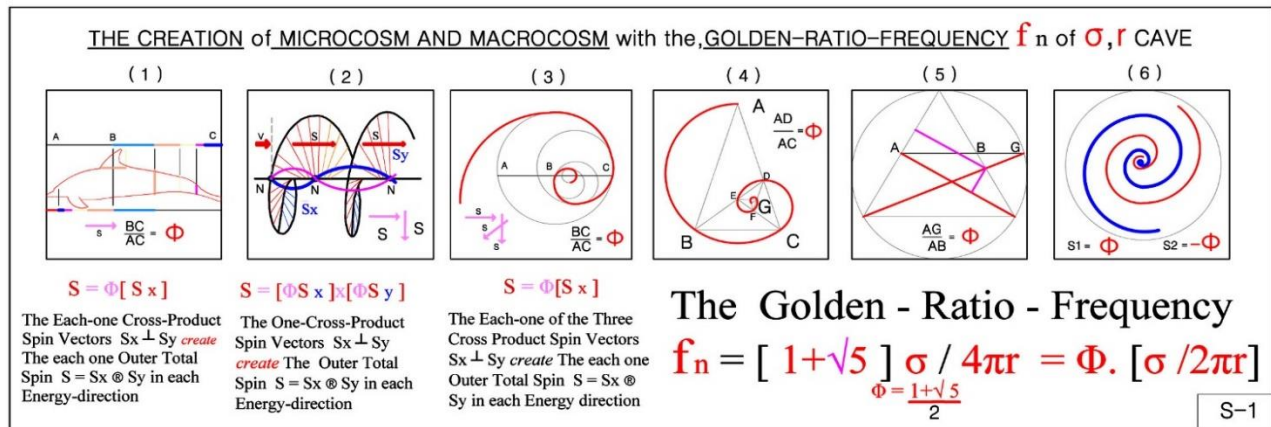


Figure 4: The Physical explanation of The Golden-Ratio Φ in Microcosm - Macrocosm.

2b: The Acceleration Growth in Material Point [87]

1. A line Vector AB on which Golden-Ratio is applied, is analogous to a Conductor $\overline{AB}$ on which Stresses $\sigma \equiv \left| \frac{2\pi r}{\Phi} \right| f_n$ on Vectors-Square is acting, and is set into vibration motion at its natural frequency $\mathbf{f}_n$. Since each natural frequency of the Conductor is associated with One of the many Standing wave-Patterns by which Conductor AB could vibrate, Then-When another one Interconnected Object Pushes Conductor with one of these frequencies, the Conductor is forced into vibrating at one of its Harmonics. Natural frequency $\mathbf{f}_n$, transports the Golden Ratio Φ Property in the other Object. This happens in Photosynthesis and etc.
2. The Equations of motion in a Material Point related to the Inner motion was referred before where the In-between-magnitude AE, The Part, becomes the Outer AB as the, Whole or the Self-Growth. This Augmentation-Property, of these two Golden-Ratios, exists in the Material-Point and on Frequency $\mathbf{f}_n$, which motion $\equiv$ Growth, and Spread in Two-Closed -Transverse Planes as is in the Propagating Electromagnetic Wave where $E \perp H$. From equations $E = h \cdot f_n \equiv \left[\frac{1+\sqrt{5}}{2} \right] \frac{h\sigma}{2\pi r} = \left[\frac{n\sigma}{8r^2} \right] \cdot \bar{B}$, $\mathbf{f}_R \equiv [f_{1=N}, f_2, f_3, f_R = \omega_N^2]$, Euler's $e^{-iA\left(\frac{\pi}{2}+2k\pi\right) \cdot b} = e^{-iA\left(\frac{\pi+4k\pi}{2}\right) \cdot b} = A \cdot \cos\left[\frac{\pi+4k\pi}{2}\right] \cdot b - i \cdot A \sin\left[\frac{\pi+4k\pi}{2}\right] \cdot b$, to $L = [\bar{B}/2] \cdot \omega$, where

then $w = \sqrt{2\pi f_R} = 2L / \bar{B}$, and the Wave Equation $y = 2A \cdot \sin(\frac{2\pi x}{\lambda}) \cdot \cos. wt.$ (a) Equation (a), is the equation of the Inner Electromagnetic wave denoting that the vertical motion, v_y , is related to the Position, x , and is defined on the Sinus curve while the horizontal motion, $v_x = 0$, frequency, w , is on the Cosines curve and is, $w = \frac{2\pi}{T} = 2\pi \cdot f_N \equiv [\frac{1+\sqrt{5}}{2}] \frac{\sigma}{2\pi r}$, which follows the Growth -Golden - Ratio - Pattern. The same happens to the Outer Electromagnetic wave which equations are, $\vec{E} = v_x \cdot E_0 \cdot \cos(kz - wt + \varphi)$, $\vec{B} = v_y \cdot [\frac{E_0}{c}] \cdot \cos(kz - wt + \varphi)$ (b) Equation (b) is the equation of the Outer Electromagnetic wave, denoting that the Electric field which travels with light velocity $c \rightarrow$ directed to $\vec{k}$ axis. Magnetic field travels with light velocity also, $c \rightarrow$ directed to $\vec{k}$, and is in Phase with Electric field. For both, Outer Electromagnetic fields the frequency, w , is that of inner motion i.e. $w = \frac{2\pi}{T} = 2\pi \cdot f_N \equiv [\frac{1+\sqrt{5}}{2}] \frac{\sigma}{r}$, which continuous to follow Growth-Golden-Ratio-Pattern Photon also occupies above Property of the Material Point and that of Growth-Pattern. With this way Photon's frequency $\rightarrow f_P = 1 / T_P$ Kick - Start, everything found on its-way. From relation, constant $k = \frac{1}{f^2_{n \cdot a^3}} \rightarrow$ or $1 = k \cdot f^2_{n \cdot a^3} \leftarrow$ then the cave-Semi-major-axis $a = \sqrt[3]{T^2 / k} = \sqrt[3]{\frac{1}{g \cdot f^2}} = \sqrt[3]{\frac{8 \cdot \pi^2 \cdot r^2}{(6+2\sqrt{5}) \cdot g \cdot \sigma^2}} = \sqrt[3]{\frac{4 \cdot \pi^2 \cdot r^2}{(3+\sqrt{5}) \cdot g \cdot \sigma^2}}$, and the $f_R = \frac{w}{2\pi} = \sqrt[2]{\frac{1}{g \cdot a^3}}$ (c) From (c) is seen that the Resonance-frequency f_R follows the Growth -Golden- Ratio-Pattern.

3. The Produced Work $\equiv$ motion, in Material-Point ZD becomes the Initial frequency f_N , as $f_N [S \equiv f_{1=n}, f_2, f_3, f_R = w^2] = n \frac{(1+\sqrt{5})\sigma}{2\pi r} = \frac{n\sigma \cdot \bar{B}}{8r^2}$, and so is the meter of Stationary motion. In case that Conductor $[Z = \oplus \rightarrow \ominus = D]$, Anti-Conductor $[D = \oplus \rightarrow \ominus = Z]$ combine to form the Special Pattern as < Standing-Wave > then at Nodes Stress $\sigma_N = \frac{2\pi r f}{\Phi} = \text{Constant}$ since $r = 0$, and at Anti-Nodes Pressure or Stress goes Up and Down $\uparrow$ twice the Amplitude of the travelling wave as $2 [\pm \sigma_N = \frac{2\pi r f}{\Phi}] = 2 \cdot k$, since the equation of a Standing wave is $y(x, t) = 2a \cdot (kx - wt)$. Because in 1-Conductor-Case a Screw-motion is Torque T_{xy} and created in an Perpendicular to ZD Plane, Torque $\rightarrow T_{ZA} = \sigma \cdot |ZA|^2 = (2\pi f r) \frac{a^2}{\Phi} = wr \frac{a^2}{\Phi} = \bar{v} \frac{a^2}{\Phi} = \sigma \Phi^3 = \bar{c} \frac{a^2}{\Phi}$, and Stress $\sigma = \frac{F}{A} = \frac{2\pi r b f}{\Phi} = [\frac{F \cdot r^2}{2}] = [\frac{e \cdot a^2}{2}] = 1,6022 \cdot 10^{-19} \cdot [\frac{a^2}{2}] \cdot C.m^2$, and the nodes are curves as (one-dimensional) one less than the dimension of the System. In the three dimensional Systems as this is the one electron in Hydrogen-cave, The Nodes are two Dimensional Surfaces and their States are, the Spherical harmonies. [70]
4. Since $T_{ZA} = \sigma \cdot |ZA|^2 = (2\pi f r) \frac{a^2}{\Phi} = wr \frac{a^2}{\Phi} = \bar{v} \frac{a^2}{\Phi} = \sigma \Phi^3 = \bar{c} \frac{a^2}{\Phi}$ carries $\frac{a^2}{\Phi}$ the Golden-Ratio-Pattern of $\sigma = \frac{F}{A} = \frac{2\pi r f}{\Phi} = \frac{\bar{v}}{\Phi} = \frac{G}{\Phi^3}$, of a Surface $A = \pi \cdot r^2 = |ZA|^2 = \Phi^2$ to the Unmeasured Photoelasticity Fringe - Pattern {Morse-Code $\equiv$ Informations}, which can be transferred from Atoms. This Procedure is used in Photosynthesis by Photons for more electricity Production. The-Stress-Way of Photon-Storages is $\bar{f}_N = \sigma / 2\pi r$, and Photon-Information $f_n = \sigma \Phi / 2\pi r$. Thus, Informations as Waves are The Colored Fringes, The Stresses, or frequencies are Deposited in Atoms as Magnetic fields and Stationary Strains, while

Motion $\equiv$ Energy $\equiv$ Waves $\equiv$ Golden Ratio Φ , which Enters The Geometry –Vectors, and forms the Elementary-Particles. [52]. From, Wave-Energy Constant $k = \frac{2\pi}{\lambda} = \frac{2\pi f}{c} = \frac{w}{c} = |\frac{\bar{v}}{c}| \cdot |r_{A-KA}|$, is $c = \frac{w}{k} = \lambda f$, or $|\frac{\bar{c}}{2 \cdot |AK_A|}| \equiv f$, i.e. The frequency f_{AK_A} of Pipe $|AK_A|$, is the Stationary-Photon's Energy-Storage $\boxed{f_n} \equiv |\frac{\bar{c}}{2 \cdot |AK_A|}|$ and $f_{Reson} = \sigma \Phi^3 = G$, or $\sigma = \frac{G}{\Phi^3} = \frac{G \cdot \sigma^3}{c^3}$ and $\sigma^2 G = c^3$, where σ_{Res} is between all frequencies. For Black-Holes, the Total-Energy $L = \bar{B} \bar{w} = \frac{J \cdot w}{2} = \frac{\pi r^4}{2} [2\pi f]^2 = 2\pi^3 r^4 f^2 = r m v = r m \cdot w r$ and mass $m = \frac{2\pi^3 r^4 f^2}{r^2 2\pi f} = \frac{\pi^2 r^2}{2} f = [\frac{\pi r \cdot v}{2}] v$, while Angular-Momentum $B = r \cdot m v = r [\frac{\pi r v}{2}] v = \frac{\pi r^2}{2} v^2 = \frac{\pi r^2}{2} c^2 = \frac{\pi r^3}{2} [n \cdot \pi \cdot c]^2 = \frac{\pi^3 r^3}{2} c^2$, or Black-Hole-Energy $\rightarrow B_{BHE} = 2 \cdot \pi^5 \cdot r^3 \cdot f^2 = (\pi r)^3 \cdot w^2 \leftarrow$ i.e. Velocity in Black-Holes is Related to Cave, r^3 , and Energy w^2 times of light velocity, and Energies in a standing wave are : The Kinetic energy is $E_K = \frac{dK}{dx}(x,t) = mv^2/2 = \frac{m}{2} \frac{\partial y^2}{\partial t^2} = \frac{m}{2} A^2 \cdot w^2 \dots (1)$ The Potential energy is $E_U = \frac{dK}{dx}(x,t) = [F/2] \frac{\partial y^2}{\partial t^2}$ and The Power transmitted $P(x,t) = -F \frac{\partial y}{\partial x} \frac{\partial y}{\partial t}$, Total Energy $E_T = E_K + E_U = [\frac{m}{2}] \frac{\partial y^2}{\partial t^2} + [\frac{F}{2}] \frac{\partial y^2}{\partial t^2}$, and Sinusoidal waves $\frac{dK}{dx} = \frac{dU}{dx} = [\frac{m}{4}] \frac{\partial y^2}{\partial t^2} = \frac{m}{4} A^2 w^2$ For more in [58]

3b: The Self-Growth Property of the Golden Ratio Stress σ

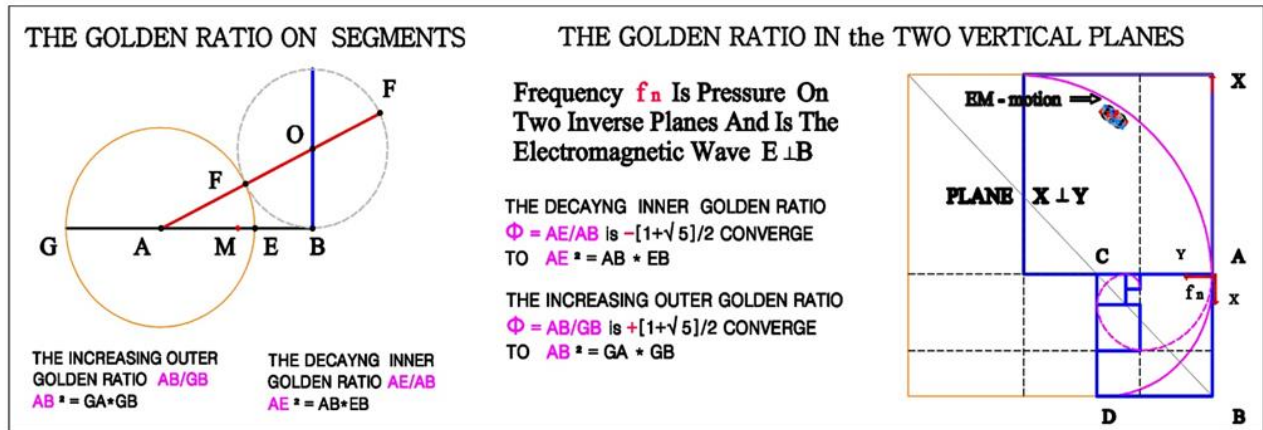


Figure 5: The Golden ratio Φ on Segment AB, and Growth on Perpendicular-Planes.

From relation $\rightarrow f_n = [\frac{2}{\pi^2 r^4}] \cdot \bar{B} \equiv [\frac{1+\sqrt{5}}{2}] \frac{\sigma}{2\pi r} \equiv [\frac{\Phi \sigma}{2\pi r}]$, then $\sigma = \frac{F}{A} = \frac{2\pi r f_n}{\Phi} = \frac{\bar{v}}{\Phi} = \frac{\bar{\lambda} f}{\Phi}$, or, $[2r] \cdot f_n \pi = \sigma \cdot \Phi = [\lambda] \cdot \pi \cdot f_n = \pi \cdot [\lambda f_n] =$ Energy E_n from a Wave of frequency f_n and Wavelength λ . The total Energy $2 \cdot E_n = \sigma \cdot \Phi = \sigma \left\{ \frac{1+\sqrt{5}}{2} \right\} = \sigma \{1,6180339, -0,6180339\} = \sigma \{e^+, e^-\}$, where for $\sigma = 1$ then, $2 \cdot e^+ = 1,6180339$, $e^- = -0,6180339 \rightleftharpoons eV$, which are the Unit -Active and Passive Actions between Material-Points $[\oplus \leftrightarrow \ominus]$. This Property of Energy relation on Φ , is either Active or Passive and is translated as $\sigma \{e^+, e^-\}$, The Density of Electric current becomes from the Electron- Orbit-motion as equation $J = \frac{i}{A} = \sigma_{n-max} = \frac{v_{n-max}}{\Phi} = \frac{\text{Amper}}{m^2} = \frac{w_n}{\Phi}$. Energy becomes from the maximum velocity which is The Kinetic energy of the Bracket-Hooks of electrons in the n-element, $E_{n-max} = \frac{m_E \cdot [v_{n-max}]^2}{2} = \frac{9,1 \cdot 10^{-31} \text{Kg} \cdot [v_{n-max} m/s]^2}{2} = \text{Joule}$. Fig-9- From Hydrogen Bracket-

Hook Ellipse, $a = 0,6$ $A = 5,29.10^{-11} = 0,529.10^{-10}$ m. $b = R_H = 12.10^{-9} = 120.10^{-10}$ m, and from equation $v = w R$, Stresses and Energy are measured.

4b: The Duality of Isochronous – Photons: [77]

Photon is the first Propagating Material-Point in existing Universe where,

1. The Space and the Anti-Space are linearly [$\leftrightarrow \updownarrow$] or [$\cup \pm \cup$] effecting and equilibrium.
2. The Space and the Anti-Space are Perpendicularly [$\perp$] effecting and equilibrium.
3. The Space and the Anti-Space are Torsionally [$\cup \cup$] effecting and equilibrium.

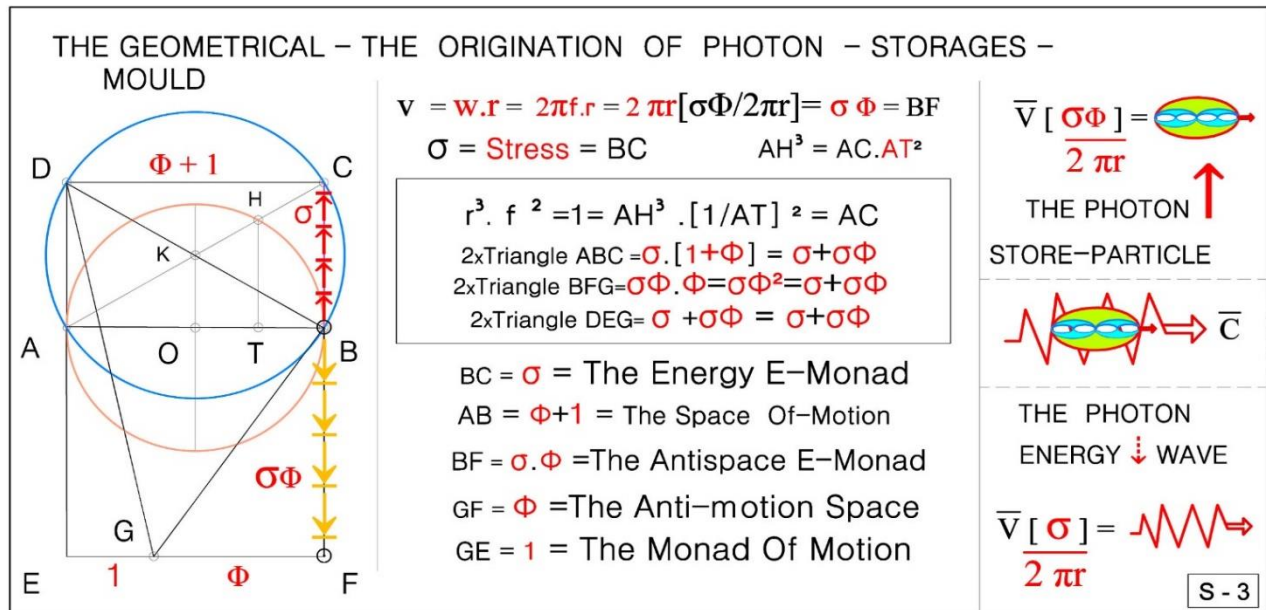


Figure 6: The Material-Geometry Mechanism of motion in Photons - Cave

FROM MECHANICS The Eternal-Rotation of the Two Elements, [$\oplus \cup \cup \ominus$], Up or Down in Material Point circles, Originates the Spins, $\pm \frac{1}{2}, \pm 1, \mp \frac{1}{2}$, of All Particles Fermions or and Bosons which combine from above Three-States just by Adding their Spins [36].

From Cauchy-Stress-Tensor under Plane-Stress conditions the Equation of Principal-Stresses $\sigma_{1,2}$, is $\sigma_1 / 2 = \pm \pm (\frac{1}{2}).\sqrt{\sigma_1^2 + 4.\sigma_2^2} = \sigma_1.[1 \pm (\sqrt{5})] / 2 = \sigma. \Phi$, which is the Golden-ratio-Pattern of the Material Point as Type of a vanishing Shear due to layers laterally shifted. Equilibrium of, ABCD, ABFE, CDEF Quadrilaterals is through Ptolemy's and Ceba's Equilibrium - relations, Fig-6. The above Material Point is the Energy-Structure of Photon which is Quantized and Equilibrium. Stability of Photon's construction of, ABCD, Rectangle issues through Ptolemy's -Theorem for Inner - Connectors [$AC.BD = AB.CD + AD. CB$], and the Ceba's Theorem for the three Outer Connectors of, ABCD, CDEF, Rectangles as $\rightarrow [CD.AE.FB = CB.FE.AD]$, BDEF, Rectangle as $\rightarrow [BD.AE.GF = BF. GE. AD]$, AEFC, Rectangle as $\rightarrow [AE.GF.BC = AC. BF. GE]$.

With this Way is succeeded the Stability of the whole structure of Photon. This minimum quantized Energy σ , was Proved that is going out the Material Point, because of Skin effect, as

acceleration and creates the Stationary gravity g , as f_n , acting on Spin as $\mathbf{S}_{PA}.r^4$. The Centripetal Force and equal to Stress σ , is $F_c = mv^2/r = 1. (wr)^2/r = w^2. r = \pm \sigma = (2\pi.f_1)^2. r = \sigma_1. [1 \pm (\sqrt{5})]/2 = \Phi.\sigma$, and since mass, $m = \frac{\sigma}{w^2.r} = \frac{\sigma}{w.c} = J$, then $\bar{B} = \frac{\bar{c}}{\Phi r} = \frac{w.\bar{c}}{\sigma.\Phi^2}$ which is a relation between, Stress Momentum and the light-velocity c .

It was shown in [70-P32] that in Cycloid, the area between the curve and the straight line is $A = 3\pi r^2$ and the arc length $l = 8r$. This Property of arc in Cycloid helps for measuring curves without using number π . For the motion on cycloid, we consider a Weight Q , at a Point A, moving with free motion. Let be AT = The Tangential Action of 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 $\sin \varphi = \frac{s}{4r}$ and 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 (a) is a Harmonic Oscillatory motion showing that Acceleration is Proportional to displacement, and is directed towards the Origin with a Period $T = \frac{2\pi}{w} = 2\pi. \sqrt{\frac{4r}{g}} = 4\pi. \sqrt{\frac{r}{g}}$, or and $w^2 = [\frac{g}{4r}]^2$, where $w = 2\pi f$.

The Origination of Frequency, or Period, happens from the above Property and is $w = [\frac{g}{4r}] = 2\pi f$. In Material-Point the Cycloidal-acceleration g_{cyc} is transformed as Centrifugal acceleration $g_{cyc} = \frac{(v)^2}{R} = \frac{g}{4r}$, where r = the Radius of the Cycloidal-circle and R is the radius of curvature. In Cycloid velocity-vector $\bar{v} \equiv \bar{\sigma}$ and it is the Glue-Bond-Stress between the Opposites $[\oplus \cup \cup \ominus]$ so velocity $\bar{v} = \bar{w}.r = 2\pi. \bar{f}.r = \bar{\sigma} = \sigma \Phi$, the Frequency $\bar{f} = \frac{\bar{\sigma} = [\sigma\Phi]}{2\pi r}$ and the Total-Energy $2L = J.w^2 = 4\pi^2.f^2$. The Circular frequency is $w^2 = \frac{(\sigma\Phi)^2}{r^2} = [2\pi f]^2$ and the Frequency for Photon is $\rightarrow f_p = |\frac{\sigma\Phi}{2\pi r}| = \frac{[1+\sqrt{5}]\sigma}{4\pi r} = \frac{\sigma.\Phi}{2\pi r}$ (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 $\bar{B} = r.mv = r.\frac{\pi.r^4}{2} 2\pi f r = \pi^2.r^4.f$. 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 $S \equiv$ Angular-momentum $\bar{B} \equiv \bar{S} = \frac{J.w}{2} = \frac{\pi r^4}{2} [2\pi f] = \pi^2.r^4.[f] \equiv \frac{[1+\sqrt{5}].\sigma.\pi.r^3}{4} = \frac{\pi r^3 \Phi.\sigma}{2}$ (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 $(O,OA) = \text{Monad} \rightarrow \oplus \leftrightarrow \ominus \equiv 1 + \Phi$ and $BC = |\sigma| =$ The Glue-Bond-Vector, $\oplus \leftrightarrow \ominus$, from the main-Stresses magnitude. $ABCD = |\sigma|.|\Phi+1| =$ The Energy-Space Rectangular Parallelogram in Plane ABC. $ABFE = -|\sigma|.|\Phi+1| =$ The Energy-Anti-Space Rectangular Parallelogram in Plane ABC, $BF = |\Phi.\sigma| =$ The Anti-Space-Vector, and $FG = |\Phi| =$ The Space-Vector magnitude.

In circle of AB diameter is created the Stress $\sigma = BC$ and both the Resultant-monad $BD = AC$ From Kepler 2nd Orbit laws the Unit-Quantized-Area, or Unit Quantized Energy is that per /sec $\rightarrow r \, d\varphi$, following equation $1 = k.f^2_u \, r^3$, and expresses the area of triangles in Fig-6.

In Figure $\rightarrow$ Triangle 2(ABC) = BC.BA = $\sigma.[\Phi+1] \equiv \sigma.\Phi + \sigma = [\text{Stress-In-Storage-}\Phi] + [\text{Moving-Stress}]$ Or Storage $S \equiv [\oplus \leftarrow \mathbf{r} \equiv \Phi \rightarrow \ominus]$ + Motion $M \equiv [\bar{\mathbf{v}} - \mathbf{Vector}]$ and from Figure where Stress σ is the motion and $\sigma \Phi$ the Storage, issues Geometry, Triangle 2(BFG) = FB.FG = $\sigma.\Phi[\Phi] = \sigma.\Phi^2 = \sigma.[\Phi+1] \equiv \sigma.\Phi + \sigma \equiv \mathbf{S}_{\text{storage}} + \mathbf{M}_{\text{motion}}$ Triangle 2(DEG) = EG.ED = $\sigma + \sigma \Phi = \sigma.[1 + \Phi] \equiv \sigma.\Phi + \sigma \equiv \mathbf{S}_{\text{storage}} + \mathbf{M}_{\text{motion}}$, and since Energy = motion / T $\equiv (\frac{v}{2\pi r}) . [\sigma + \sigma \Phi] = \bar{v} . [\frac{\sigma}{2\pi r} + \frac{\sigma\Phi}{2\pi r}] \equiv \bar{v} . [\frac{\bar{f}_n}{2\pi r} + \mathbf{f}_n] \equiv \text{Moving - Storage} \rightarrow [\bar{v} . \frac{\bar{f}_n}{2\pi r}] \leftarrow + \text{Moving-Frequency} \rightarrow [\bar{v} . \mathbf{f}_n] \leftarrow \equiv \text{Material-Point}$ i.e. The Energy Produced in Photon-Cave is consisted of Two-moving-Storages, that travel as Wave $[\bar{v} . \mathbf{f}_n] \rightarrow [\bar{v} . \frac{\bar{f}_n}{2\pi r}] \rightarrow [\bar{v} = \bar{c} = \lambda \frac{f}{\Phi}] \rightarrow [S \equiv \text{EM-R} \equiv f_{1=N}, f_2, f_3, f_D, f_n = w^2]$ and, as Particle $\rightarrow [f_1 = (E^2 + H^2) = n \frac{(1+\sqrt{5})\sigma}{2\pi r} = \frac{n\bar{B}}{\pi^2 r^4}] \rightarrow \{W \equiv \text{EM-R} \equiv [\epsilon E^2 + \mu B^2] = 2.\lambda c.\sin.2\varphi\}$ and The Duality of an Energy-Storage $S \equiv \{[\oplus \leftarrow \mathbf{r} \rightarrow \ominus] + \text{Motion } M \equiv [\bar{\mathbf{v}} - \mathbf{Vector}]\}$, Therefore $\rightarrow$ Photon is travelling Both as Particle and as Wave, as

1. Energy-Storage $S \equiv [\oplus \leftarrow \mathbf{r} \rightarrow \ominus] \equiv \text{As Particle } [\bar{v} . \frac{\bar{f}_n}{2\pi r}] \rightarrow [\bar{v} = \bar{c} = \lambda \frac{f}{\Phi}] \rightarrow \text{i.e. a Stationary Standing - Wave} \rightarrow [S \equiv \text{EM-R} \equiv f_{1=N}, f_2, f_3, f_D, f_n = w^2].$
2. Energy-Motion $M \equiv [\bar{\mathbf{v}} - \mathbf{Vector}] \equiv \text{As Wave } [\bar{v} . \mathbf{f}_n] \equiv [\mathbf{f}_1 = (E^2 + H^2) = n \frac{(1+\sqrt{5})\sigma}{2\pi r} = \frac{\bar{B}}{\pi^2 r^4}] \rightarrow \text{i.e. a Propagating Wave as} \rightarrow \{W \equiv \text{EM-R} \equiv [\epsilon E^2 + \mu B^2] = 2.\lambda c.\sin.2\varphi[\varphi = \frac{\bar{B}}{\Phi}]\} \leftarrow$

The moving Storages of Photons and The Stability of Dual-frequency $\mathbf{f}_{\text{Photon}}$:Photon is a Material-Point in cave r , where its Inner is the Stationary-Standing-wave from Electromagnetic-Wave $[E^2 + H^2] = 2(2r).c.\sin 2\varphi$ with n Lobes representing the Normal mode vibration with frequencies $f_n = n.f_1 = \frac{E}{h} = \frac{n.v}{4r} = \frac{n\sigma}{8r} [1 + \sqrt{5}] = \frac{n.\sigma\Phi}{2\pi r}$, and its Outward is as the Propagating Electromagnetic-Wave $\rightarrow \{[\epsilon E^2 + \mu B^2] = 2.\lambda c.\sin.2\varphi\} \leftarrow$ where Particle $2r = n\lambda$, Cave r , is the Electromagnetic-Energy-Storage, and Electromagnetic-Radiation E, B is the Wave conveyer. Following above constituents of Photon then, Since Energy is motion and the, Total - Energy of Elementary - Particle is equal to the $\rightarrow$ Intrinsic Rotational + Kinetic Energy from velocity, then according to the conservation law of Energy, this Energy is stored into Neutral caves as Stationary Loops consisting the Lobes, and thus Producing the Space and the Anti - Space Particles with velocity vector the remaining of the Energy Term. It is Proved that Hydrogen cave is the lightest and less-mass element. The Breakage-Principle, is the way of Energy conservation, where Energy never annihilates and which is always reverted into $\rightarrow$ the two Opposites as $\{(\pm w)$ or the Conveyers $\equiv$ Carriers $\}$ and an Neutral Part $2.\nabla i$ which is the Energy-store $\equiv$ a Tank Energy $\equiv$ or as Matter $(+ w)$, as Antimatter $(- w)$ and as Energy Part, $2L = \bar{B} . \bar{w}$ i.e. Energy $\equiv$ Motion $\equiv$ Space + Anti space + Kinetic Energy, Vibrations of Systems issues for Orbits as $\rightarrow W = 4\pi^2 . \frac{r^3}{T^2} . \bar{n} = 4\pi^2 . r^3 . \mathbf{f}_p . \bar{n} \leftarrow$ and agree, to Kepler celestial law such as for macrocosm and for microcosm.

Using the Material - Geometry - Vectors for the Anti-Space Action then, From Force $G_{\text{ON-AntiSpace}} = \overline{AB} \times \overline{BF} \equiv [\Phi+1] \times \{|\bar{\sigma}| \cdot \Phi \equiv \sigma \cdot \Phi\} = \Phi^2 \cdot \sigma \Phi = \sigma \cdot \Phi^3$, or, $G_{\text{AN}} \equiv \overline{AB} \times \overline{BC} \equiv \sigma \cdot \Phi^3 \equiv \boxed{\bar{\sigma} - \text{Stress}} \boxed{[\oplus \leftarrow \Phi \rightarrow \ominus]} \boxed{[\oplus \leftarrow \Phi \rightarrow \ominus]} \boxed{[\oplus \leftarrow \Phi \rightarrow \ominus]}$ and $\rightarrow \rightarrow \rightarrow$ Primary-Energy $\equiv G \cdot \mathbf{f}_p \equiv h$ and OR $G^{-1} \times \sigma \times \Phi^3 \equiv 1 \leftarrow \leftarrow \leftarrow$ where $G \equiv$ The Newton's - Universal Force = $6,680561 \cdot 10^{-11} \text{ m}^3/\text{Ns}^2$, $\sigma \equiv$ The Glue-Bond-Stress in Material-Points $\sigma = \frac{2\pi r f}{\Phi} = 1,85 \cdot 10^{-11} \text{ Kg/m}^2$ and f in Planck's length $L_p = e^{-i \cdot (5\pi/2) \cdot 10}$ is Frequency $\mathbf{f}_{\text{Plank}} = \frac{c}{2\pi r} = 2,952362 \cdot 10^{42} \text{ H}$, Length $L_p = e^{-i \cdot (5\pi/2) \cdot 10} = \{\sqrt{3} \cdot \pi \cdot 1,616199 \cdot 10^{-35} \text{ m}\}$, $\Phi \equiv$ The Golden-Ratio Pattern $\Phi = \frac{(1+\sqrt{5})}{2} = 1,6180339887$.

From above relations is seen that, in Universe exists the only one Force $G \equiv \sigma \cdot \Phi^3$, which is Acting on all Quantized-Quantities as $G \equiv \sigma \cdot \Phi^3 \equiv \Phi^2 \cdot [\sigma \Phi] \equiv 2\pi \mathbf{f}_p r \equiv w r \equiv \bar{v} \equiv m a = \bar{c}] \leftarrow$ and From $\sigma \times \Phi^3 \equiv G \rightarrow [1,846462 \cdot 10^{-11}] \cdot [3,618033989] = 6,680561 \cdot 10^{-11} \text{ o.e.}\delta.(q.e.d)$ i.e. Universe is a Monad, Becoming from a HUGE-MAGNET of Opposites $\oplus, \ominus$ which Forms $> \rightarrow$ The 3-Dimensional SPACES Φ , ANTI-SPACES $|\Phi \cdot \sigma|$, and $> \rightarrow$ Energy, where ENERGY $\equiv$ MOTION through the G - Force, and the Stress - σ - becoming from Photon. Or. The Ubiquity of Material-Geometry in Electromagnetism is Everywhere.

Remarks on the Duality-Photon $\rightarrow \{\bar{c} \cdot \boxed{\bar{f}_n} + \bar{c} \cdot \mathbf{f}_n\} \leftarrow \equiv \rightarrow$ Particle + Wave $\leftarrow$

- From equations $f = \frac{\sigma_1 \Phi}{2\pi r}$ and $\sigma_1 \cdot [1 \pm (\sqrt{5})]/2 = \sigma \cdot \Phi$, then Frequency $\mathbf{f}_p$, of Photon, is Independent of the Amplitude $[\epsilon E^2 + \mu B^2]$ of the Vibration, it is Not-Damped and Not-Driven, and so can be related to Any-Force that can Produce Work $\equiv$ Energy as Wave and thus can be Quantized to any Monad. The Electromagnetic-Spectrum $\equiv$ Photon in all its frequencies, which as Frequency f , or as Period T , is the Regulator of the Light - Signals. Photon's Amplitude, A , is referred to its Intensity from relation $A \cdot c \cdot T = k = \text{constant}$, and in the Particle case (not seen Particle and wave simultaneously) is the number of Photons.
- Photon striking on an Object of Microcosm or Macrocosm then, It is a Source that Gives $\rightarrow$ Energy as Energy-Storage, $\boxed{\bar{f}_n}$, and Information as the G-Ratio Propagating - Energy $\mathbf{f}_n$.
- Photon in the Microcosm of Hydrogen-Cave, can Give such Potential-Energy or Kinetic Resonance Energy as Frequency $\mathbf{f}_R$ and Energy in [Bracket-Orbit-Hook] which Joins the Atoms to Produce the Molecules and Crystals. [101]
- Photon striking on Hydrogen-Cave can Produce the Resonance-Energy-Frequency $\mathbf{f}_R$, such that can Produce Photos and Image-Fringes of Inter-Atom or any other Structures in Atoms. The Amplitude of the EM - Wave is a measure of the Strength of the Electric and Magnetic field describing the Wave-nature of light and the Number of Photons the Particle-nature, as this happens in Antenna which detects, the Wave, where a higher Amplitude EM-Wave will cause more Voltage and current in the Antenna.
- 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 the Storages $\boxed{\bar{f}_n}$ everywhere then it stops and diffuses. The Kinetic-Energy E_K of a moving Material - Point, as this is the

Photon, is stored as motion in its Storage, $r = [n \lambda/2]$ with the, n frequencies $f_n = n \cdot f_1$, with n lobes and with the fundamental frequency f_1 .

From above is seen the Passage and The -How EM-Radiation can travel in Crystals and which is the Cauchy-Stress-Tensor where $E \perp B \perp r \equiv \sigma_1 \perp \sigma_2 \perp \sigma_3$, in-where Energy Propagates along 3 Directions without Birefringence which are the tracks of the Stresses, and carries the motion $\equiv$ Energy Storage r which radiation is The Conveyer, the Storages $\boxed{\bar{f}_n}$.

Above Procedure can be used in Cells where cells are cases of a Birefringence material and their 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 can change the Inner-Structure of Cell to another desirable Property. A wide Analysis in [84-86-90]. Moreover, in open Conductors the Conductor's Resultant-Energy-Vector is as an Cruise-missile where for Primary-Forces the Energies $|k_x \cdot k_y| = |\leftrightarrow| \cdot |\updownarrow| \equiv \otimes$ become very strong Cruise-Ballistic-missile.

It was shown that Forces Beyond-Planck-Length are $\rightarrow F = \Phi^3 \cdot \boxed{[\oplus \sigma \ominus]} = \sigma \times \Phi^3 \leftarrow$ Force G acts $\rightarrow$ on the Spinning M-Points on $\bar{S}$ through $\bar{g} \rightarrow$ on Planck's - $\bar{B} \rightarrow$ on $\mathbf{g}_G$, through the Resonance frequency $\mathbf{f}_R$. It was proved that $G = \sigma \Phi^3$, and $\sigma = \frac{G}{\Phi^3} = \frac{G \cdot \sigma^3}{c^3}$, or $\sigma^2 G = c^3$, where σ is a Stress between the frequencies. From Force-relation $F = \sigma A = (2\pi f r) \frac{A}{\Phi} = w r \frac{A}{\Phi} = \bar{v} \frac{A}{\Phi}$, is seen that force G becomes a velocity $\bar{v}$. In the case of Planck's length this velocity is $\bar{c} = w r = \frac{\sigma \cdot \Phi}{r} r_p = \sigma \times \Phi = \left| \frac{G L_p}{r \Phi^3} \right| \Phi = \left| \frac{G \cdot L_p}{r \cdot \Phi^2} \right|$ and from Gravity relation $G \equiv \sigma \times \Phi^3$, then issues $\rightarrow [\bar{c} = \frac{G L_p}{r \cdot \Phi^2}] = [\bar{c} = \frac{2 \cdot G L_p}{\lambda \cdot \Phi^2}]$ which is the Light-velocity vector.

Since r , becomes from the Beyond-Planck's-Region then $\rightarrow \bar{v} = \frac{F \cdot \Phi}{A} = \left[\frac{G \cdot \Phi}{A} \right]$ or $G = \bar{v} \frac{A}{\Phi}$, a Viscus-Damping-Force where $\frac{A}{\Phi}$ is a constant of Proportionality and motion $\mathbf{F}_G = \left[\frac{A}{\Phi} \right] \cdot \dot{x}$

5b: The Quantum Interference of the Duality-Photon

Quantum Interference is the Phenomenon when, a Photon Interferes with itself. [92E]. This Proposition is Right when Photon is considered having a twin-existance, as [101]-3c. P-21.

The Problem is to determine the expression of the Power developed by the Gravitational. From Dual-Photon-equation, $\bar{v} \cdot [\boxed{\bar{f}_n} + f_n] \equiv \left| \frac{v}{\pi^2 \cdot r_n^4} \right| \cdot \boxed{\bar{B}_n} + |\bar{c}| f_n$, when $c = 0$ or $\bar{c} = \bar{c}$, then Photon motion becomes $\rightarrow \left| \frac{v}{\pi^2 \cdot r_n^4} \right| \cdot \boxed{\bar{B}_n} \leftarrow \equiv$ Spin. i.e. The Stationary Photons exist as their Spin only. This Rest-Space is the Part $\left| \frac{v}{\pi^2 \cdot r_n^4} \right| \cdot \boxed{\bar{B}_n}$, and its Communication Code to be the term $\left| \frac{v}{\pi^2 \cdot r_n^4} \right| = \left| \frac{w r}{\pi^2 \cdot r^4} \right| = \left| \frac{2 v}{2 \pi^3 r^4} \right|$, The Rest Space is a Stationary Wave with fundamental frequency $f_1 = \frac{1}{T_1} = \frac{\bar{\lambda}}{c}$, with an Electric Wave, that is acting on vector $\bar{c} = (i \cdot c_x + j \cdot c_y)$.

It was proved [78] that the Newton's Gravitational constant G does NOT effect on Plane Surfaces but on Volume Surfaces only. This Property of G means that the only Force which effects on the Rest-Space is the Torsional motion, and on the light velocity vector $\vec{C}$, is gravity g only. This Torsional motion occupies the Dual Property to be Space as Particle and Energy as Wave. In Universe where exist Hudge masses Energy becomes Black-Holes.

The Work as Impetus-Momentum and Energy Produced in all Systems is Conserved. Empty Space is Isotropic when all its Directions are Equivalent i.e. all Relatively Natural Sizes and Laws remain Inalterable with Rotation, therefore is in effect via, master-meters. [45-47]

Considering Photons to be any two Energy-Systems (a) and (b), where, R (a) = The Place (Position) of the System (a), U (a) = The total Impetus of System (a). L_a = The Impulse of any System from a fixed beginning, reference Point 0, then is holding, Total Impulse $L = L_a + L_b = R$ (a). $F(a)+R$ (b). $F(b) + R(a).$ U (a) + R (b). $U(b) = \text{Constant}$.

The Dynamic Energy of System (a), (b) don't depend on Time, but only from the Relative Places of the Elements where are the Points, Master -Meters, i.e. exists Energy-Space and Not Space-time. Work $W = Fab.\delta ra=ma. (dUa/dt).dr = \frac{1}{2} d [ma.Ua"] + Fba.\delta rb = \frac{1}{2}.d[mb.Ub"]$ therefore, Dynamic Energy change is $\delta V = - Fab.\delta ra - Fba. drb$ and $\rightarrow D - W = dV$, and as T , is kinetic Energy, $dV = d[1/2.ma.Ua" + 1/2.mb.Ub "]$ or $d (V+T) = 0$ and, $V + T = \text{Constant}$.

This Property of Energy, $L = L_a + L_b = \text{Constant}$, means the Halve - Equilibrium of Energy.

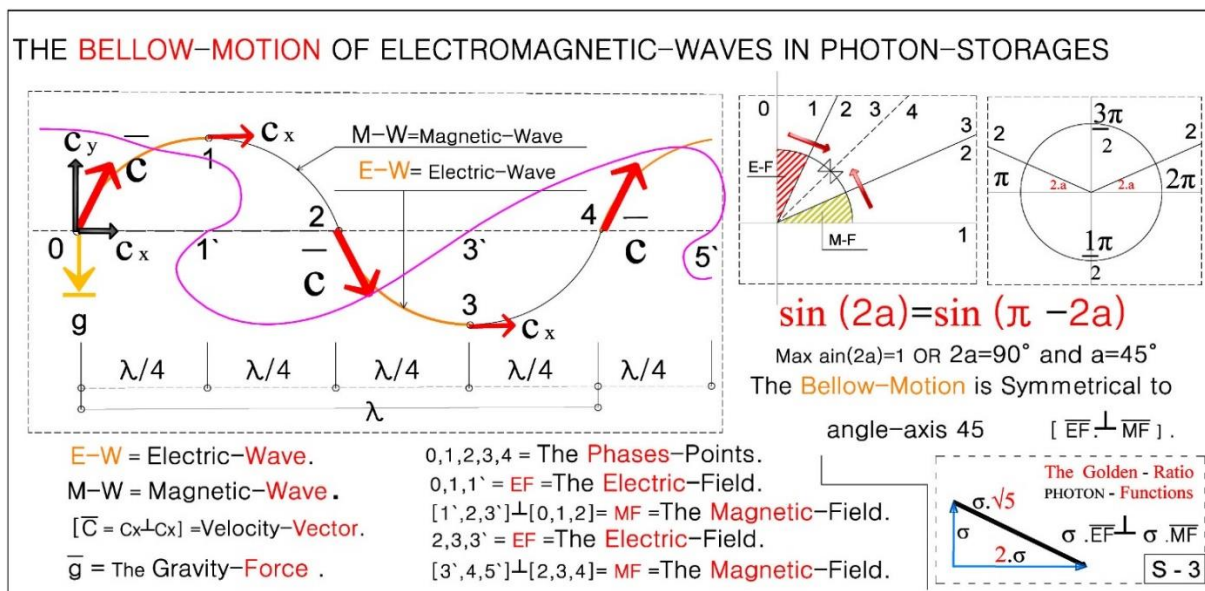


Figure 7: The Stability of $\{\oplus$ - Space [Electric Wave], $\{\ominus$ - Anti-Space [Magnetic Wave] of Sub-Space $[\{\oplus \leftrightarrow \ominus\} \equiv ds \equiv [\oplus \leftarrow ds \rightarrow \ominus]$ - or - The Neutral-Space $[A_E, B_E, C_E]$

Since c is constant, it is analyzed to, (c_x, c_y) in any two directions x, y where $x \perp y$ and y to be the gravity direction on where gravity is acting.

The produced Work is in y - Range, $S_y = c_y t - \frac{1}{2} g t^2 = c \sin at - \frac{1}{2} g t^2$, where maximum Range is $S_{\max-y} = c_y^2 / 2g = \frac{(c \sin at)^2}{2g} = [\frac{c^2}{2g}] \sin^2 a$, happening at angle $a = 90^\circ$ and where $\sin^2 a = 1$. Since at Point (1) the velocity $v_y = 0$, the motion in 0-1 range, maybe considered as falling in linear motion and so issues $v_y = g t$ or time $t = \frac{v_y}{g} = \frac{(c \sin at)}{g}$, as halve Period with total Period $\rightarrow T = \frac{2(c \sin at)}{g}$. In figure are seen the 4-Point Positions, at where change the Phase and the Work done in each Phase of Photon's inner motion.

The 4-Phases correspond to the Wavelength. λ , as $\lambda / 4$. distance with $90^\circ = \frac{\pi}{2}$ to be the change of Phase. This means that the Produced Work in the Prior Phase -Area as the Golden - Ratio Pattern is Stored in the Next and Perpendicular Phase-Area.

The Total distance for doing Work is the Wavelength λ , in total Period T as $\lambda = c_x T = c \cos a \cdot T$ or $\lambda = c \cos a \cdot \frac{2(c \sin at)}{g} = [\frac{2c^2}{g}] \sin a \cos a = [\frac{c^2}{g}] \sin 2a$,(1) since from trigonometry exists, $\sin 2a = 2 \sin a \cos a$.

The maximum wavelength λ happens when **$\sin 2a = 1$** or $2a = 90^\circ$ and $a = 45^\circ$, i.e. $\rightarrow$ The Total motion in the Wavelength, λ , corresponds to the angle $a = 45^\circ$, meaning that the motion of Space $\equiv$ The Electric-field -, and Anti-space $\equiv$ The Magnetic-field, equilibrium as an Bellow. The two Wings in 90° Type simultaneously oscillate to its 45° Bisector -axis, and the Produced Work from The Electric-field-area is Stored into the Magnetic-field - Area. The common axis of the two Perpendicular fields carry the G-Ratio Surfaces, Runs with the same velocity $\bar{c}$ to the direction of the inner motion Or, From $90^\circ \rightarrow 45^\circ$, the created Work $W = c_y g$ is Symmetrically Stored from $0^\circ \rightarrow 45^\circ$.

The created Work in [0-1] is in $\rightarrow \lambda / 4$ of transverse surface and is stored in the horizontal and Perpendicular surface [1'-2] = $\lambda / 4$. Surface [0-1-1'] = $\perp$ Surface [1'-2'-2].

The created Work in [1-2] is in $\rightarrow \lambda / 4$ of transverse surface and is stored in the horizontal and Perpendicular surface [2-3'] = $\lambda / 4$. Surface [1-2-1'] = $\perp$ Surface [2'-3'-2].

The created Work in [2-3] is in $\rightarrow \lambda / 4$ of transverse surface and is stored in the horizontal and Perpendicular surface [3'-4] = $\lambda / 4$. Surface [2-3-3'] = $\perp$ Surface [3'-4'-4].

The created Work in [3-4] is in $\rightarrow \lambda / 4$ of transverse surface and is stored in the horizontal and Perpendicular surface [3'-4] = $\lambda / 4$. Surface [3-4-2] = $\perp$ Surface [4'-5'-4].

Since from Trigonometry issues $\sin 2\pi = \sin(180 - 2a) = \sin 2(90 - a)$ then (1) becomes. $\lambda = c \cos a \frac{2(c \sin at)}{g} = [\frac{2c^2}{g}] \sin a \cos a = [\frac{c^2}{g}] \sin 2a = [\frac{c^2}{g}] \sin(\pi - 2a) = [\frac{c^2}{g}] \sin(\frac{\pi}{2} - a)$... (2) since **$\sin 2a = \sin(180 - 2a) = \sin(\pi - 2a)$** , and issues also **$\sin 2a = \sin(180 - 2a) = \sin(\frac{\pi}{2} - a)$** .

From Dual-Photon-equation, $\bar{v} \cdot [\bar{f}_n] + f_n \equiv \left| \frac{v}{\pi^2 \cdot r_n^4} \right| \cdot [\bar{B}_n] + |\bar{c}| f_n$, when $c = 0$ or $\bar{c} = \tilde{c}$, then Photon motion becomes $\rightarrow \left| \frac{v}{\pi^2 \cdot r_n^4} \right| \cdot [\bar{B}_n] \leftarrow \equiv \text{Spin}$. i.e. The Stationary Photons exist as their Spin only. The Rest-Space is the Part $\left| \frac{v}{\pi^2 \cdot r_n^4} \right| \cdot [\bar{B}_n]$ where $v = n \cdot \pi \cdot c$, and Communication Code to be the term $\left| \frac{v}{\pi^2 \cdot r_n^4} \right| = \left| \frac{n \cdot \pi \cdot c}{\pi^2 \cdot r_n^4} \right| = \left| \frac{n \cdot c}{\pi \cdot r^4} \right| = \left| \frac{w \cdot r}{\pi^2 \cdot r^4} \right| = \left| \frac{2 \pi f}{\pi^2 r^3} \right| = \left| \frac{2 \cdot f}{(\pi r^3)} \right|$ with Electromagnetic-Radiation the in monads frequency- f which is satisfied by the relation $\left| \frac{2(rw)}{2v} \right| = \pi/2, \pi, 3\pi/2n, [\pi/2]$, and $w = n \cdot \left[\frac{\bar{v}}{2r} \right] \times \left[\frac{\pi}{2} \right]$, where $n = 1 \rightarrow \infty$. When two Photons strike each other, $\bar{c} = \tilde{c}$, or reflect on a wall, then $c = 0$, and from Spin $\bar{S} = \bar{B} = \pi^2 \cdot r^4 \cdot f_1$ its angular velocity $w = n \cdot \left[\frac{\bar{v}}{2r} \right] \times \left[\frac{\pi}{2} \right] = 2\pi \cdot f_1$, where then its fundamental frequency $f_1 = n \cdot \left[\frac{\bar{v}}{2r} \right] \times \left[\frac{1}{4} \right] = n \cdot \left[\frac{\bar{v}}{8r} \right]$ which for $n = \left[\frac{16 \cdot r^2}{v \cdot c} \right]$ increases to $\frac{\lambda}{c} \cdot r^3$ and Photon-motion becomes $\rightarrow \left| \frac{v}{\pi^2 \cdot r_n^4} \right| \cdot [\bar{B}_n] \leftarrow \equiv \text{Spin}$, i.e.

The Stationary Photons are Spin only and consist an Stationary - Harmonic - Vibration with the same Period T of the two Waves. [92-E].

The effective-Range of the Wavelength λ , for the Dual-Photon is related to the consistence v_x, v_y , velocities to any two Perpendicular directions of Electromagnetic fields E_x, E_y .

The maximum displacement in y , direction is the centrifugal $\lambda_x = \frac{v_y^2}{2 E_y}$ and $\sin(\varphi) \lambda_y = \frac{c^2 \cdot \sin^2(\varphi)}{2 E_y}$ where φ = the Phase difference between the two vibrations λ_x, λ_y .

Since time t , is the same between the two vibrations where then $t = \frac{v_y}{E_y} = \frac{c \cdot \sin(\varphi)}{E_x}$ and since the Period = $2 \cdot t$ then $T = \frac{2c \cdot \sin(\varphi)}{E_x}$ (2) From the in $x \rightarrow$ direction velocity $v_x = c \cdot \cos(\varphi)$, and displacements, λ_x, λ_y , become, $\lambda_x = v_x T = c \cdot \cos(\varphi) \left\{ \frac{2c \cdot \sin(\varphi)}{E_x} \right\} = \lambda_x = \left\{ \frac{2 \cdot c^2}{E_x} \right\} \cdot \sin(\varphi) \cdot \cos(\varphi) = \left\{ \frac{c^2}{E_x} \right\} \cdot \sin(2 \cdot \varphi)$... (3)

Since in trigonometry issues, $\sin(2\varphi) = \sin(\pi - 2\varphi) = \sin\left(\frac{\pi}{2} - \varphi\right)$ and in Physics $E_x = g$, then $\rightarrow \lambda_x = \left\{ \frac{c^2}{g} \right\} \cdot \sin(\pi - 2\varphi)$, and $\lambda_y = \left\{ \frac{c^2}{g} \right\} \cdot \sin\left(\frac{\pi}{2} - \varphi\right) \leftarrow$ (4)

i.e. Photons occupy

1. The Dual-Property of Particles and Waves,
2. The Dual-Property of Stationary Spinning,
3. The Dual-Property of Simultaneous existence,
4. The Dual-Property as Electric and Magnetic Fields in, λ_x, λ_y ,
5. The Dual-Property Transverse E-M Wave $\perp$ Propagation-Direction
6. The Bellow motion in transverse E-M- Waves as the way of flying,
7. The Electric Effective Range is thrustured through G only. [Fig-7].

8. With the same initial velocity is succeeded the same Length-Range with Two complementary angles. since $v_y = c$.

Remarks:

1. The Produced-Work happens at $\lambda / 4$. wavelength in 4-Phases and it is Quantised.
2. The Quantised-Work in $\lambda / 4$. wavelength is the $\frac{1}{2}$ of the first lobe of the Sinusoidal Wave.
3. Photons follow the Aeroplanes Bellow motion to fly as (thrust - drag, weight - lift).
4. It was shown that when Two Photons strike each other, $\vec{c} = \vec{c}$, or reflect on a wall, then $c = 0$ and the Produced Energy enters the cave r . The fundamental frequency of the Stationary-cave is $f_1 = n \frac{\sigma\Phi}{2\pi r} = n. [\frac{\bar{v}}{2r}] \times [\frac{1}{4\pi}] = n. [\frac{\bar{v}}{8\pi.r}]$ which for $n = [\frac{8\pi r c}{v.\lambda}]$ increases to $\frac{\lambda}{c}$, therefore for $n = N. [\frac{8\pi r c}{v.\lambda}] = N. |\frac{8\pi r}{\lambda}|$, and for $N \rightarrow \infty$ then $f_1 = E / h = \infty$ (b) In Dual Photon $\bar{v}. [\frac{\sigma\Phi}{2\pi r} + \frac{\sigma}{2\pi r}] \equiv \bar{v}. [\bar{f}_n] + f_n$, Colours are Still-Sub-Units of Storage $[\bar{v}. \bar{f}_n]$ and exist as the Frequencies, Violet, Blue, Green, which Stabilize with their Complementary colors Yellow, Orange, Red, of wavelength $d = \lambda \rightarrow \lambda_{\min} \approx \lambda_{\max} = 3.10^{-7} \text{ m} \approx 3.\sqrt{3}.10^{-7} \text{ m}$

4-1: The Quanta of Energy, as Intension Passing through a Unit-Surface or Volume and is Inversely Proportional to the fourth Power of the wavelength λ as $I = 0,5865. \{\frac{1}{\lambda^4}\}$. When $f_{BE} = E / h = \infty$ then the Energy-Intension Increases and the wavelength λ Decreases and for $f_{BE} = \infty$ then $\lambda = 0$. It is what happens to Photons in Black-Holes where $d = \lambda = 0$, and the How is the Unit-Surface or Volume in where $E = f_{BE} = \infty$.

4-2: The Proton Total-Harmonic-Charge $\rightarrow Q_T \equiv 2.q_u + q_d$, and from $d = \lambda$ then $f_p = \sqrt{\frac{k}{m\lambda}}$
Applying the above to White light, which is composed of all colours of visible light with different wavelengths, when it passes through our atmosphere the tiny molecuclms cause it to scatter. Scattering or the redirectioning increases as the wavelength of the light decreases. Violet, Blue, Green, have Shortest wavelength and more Scattering, while Yellow, Red Dark-Red have Longest wavelength and Shortest Scattering, as is the Raylight-scattering. Atoms have a common way for Recognizing the In-Between Electromagnetic Pattern, and which is through the, Resonance of tone $\equiv$ The Resonance frequency, $f_R = \sqrt[2]{\frac{k}{M}}$, where k = Their Stiffness and M = The Harmonic-mass of their Compound.

In Mechanics, the Kinetic Energy is equal to Potential $E_K = E_P$, and Total Energy $E_T = 2.E_K = 2.E_P$ or $\rightarrow \frac{1}{2} m v_i^2 = \frac{1}{2} k d = \frac{1}{2} m (w r_i)^2$, and for stability issues, $k d = m w^2. d^2$, or $w^2 = \frac{k}{m} [\frac{1}{d}]$, or $\bar{w} = \sqrt{\frac{k}{m} [\frac{1}{d}]} = 2\pi. f$, and $f = \frac{1}{2\pi} \sqrt{\frac{k}{m d}}$. From Energy equation $E = h f = \frac{h}{2\pi} \sqrt{\frac{k}{m}} = \frac{6,6260696.10^{-34}}{2\pi} \sqrt{\frac{k}{m d}}$
 $= 1,054572.10^{-34} \sqrt{\frac{k}{m d}}. J = 1,0545717.10^{-34} \sqrt{\frac{k}{m}} / 1,6022.10^{-19} \text{ eV} = 6,582022.10^{-16} \sqrt{\frac{k}{m}}. \text{ eV} = E_{\text{KINETIC}} + E_{\text{POTENTIAL}} = E_{\text{TOTAL}}$, i.e.

In Mechanics, The equality of the Two Opposite-quantities $E_K = E_P$, is conserved in a common loop as $\rightarrow \sqrt{\frac{k}{m_d}} eV \leftarrow$ meaning that when two Photons strike each other then the Produced Work is kept in the cave, r , as fundamental frequency $f_1 = n \frac{\sigma\Phi}{2\pi r}$, and which is equal to The Eigenvalues and Eigenvectors of the Photons-Heap.

Above Procedure and because of their common Inertia of Atoms-masses alllows us to accept the Angular- velocities of each Atom separately, and to be so its Identity.

When the Quanta of Energy Rotate in a cave and exists, Maxwell's Electric Displacement current the Stability of $\{\oplus$ -Space $\equiv$ [Electric Wave], $\{\ominus$ -Anti-Space $\equiv$ [Magnetic Wave] Exists In the Sub-Space $\equiv \{[\oplus \leftrightarrow \ominus] \equiv ds \equiv [\oplus \leftarrow ds \rightarrow \ominus]$ - or - In the The Neutral-Space $[A_E, B_E, C_E]$. The Superflow of Energy stills in Sub-Spaces and finally in Black-Holes:

6b: The Stability of Space - Anti-Space, IN the Neutral-Space

The number of Moulds of Stationary-States are as $\rightarrow 2^{n-1-4} \text{ Points} \equiv 2, 4, 8, 16 \equiv 4\text{-Types} \leftarrow$ i.e. Monads are formed from the First 4- Euclidean-Primary-Moulds $\rightarrow$ Vector, Straight line, Plane Surface, Volume $\leftarrow$ as The 1-Point which is everywhere, the 2- Points which form the Vectors, the 3- Points which form the Planes, the 4- Points which form the Volumes.

For $n > 4$, as this is the Atom Structure, follows the Sustainability of the Spaces and Anti-Spaces. Since Space-Energy Structures follow the M-Geometry Stability so these follow the Mould of Spaces $2^{n-3} = 8$ Elements and which is The-Cube as was shown before.

Since Space $\equiv \{\oplus = \text{Electric Wave}\}$, Anti-Space $\equiv \{\ominus = \text{Magnetic Wave}\}$, Sub-Space $\equiv [\oplus \leftrightarrow \ominus] \equiv \text{Wavelength } \lambda \equiv \text{The Neutral-Points E, M Still at Halves as } + \equiv [\oplus \frac{\pi}{2}], - \equiv [\ominus \frac{\pi}{2}]$

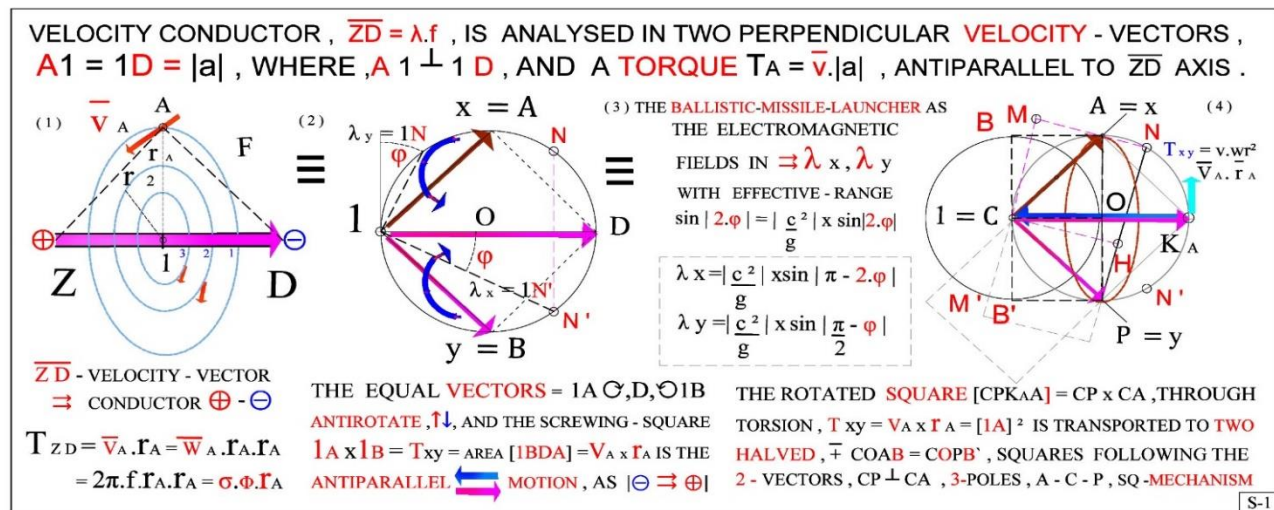


Figure 8: The Stability of Photon as Electromagnetic Wave with the Two frequencies.

The Dual Property of The Simultaneous existence as Electric and as Magnetic Fields in wavelengths, λ_x, λ_y , as Effective Range, which is thrust through the Newton's Gravitational

Force G, only becomes from the Trigonometry relations, $\sin(2\varphi) = \sin(\pi - 2\varphi) = \sin(\frac{\pi}{2} - \varphi)$ and from Physics $E_x = g$, Maxwell Electric Displacement current $\vartheta D / \vartheta t$ is created from (c_x, c_y) Vectors motion which happens from the gravity continuous action which Produces the Work $W = c_y g$.

Since E -W, M -W, are both the Resultance of circular -frequencies W_R , it reveals the coupling of motion $\{E-W\} \rightarrow \vartheta \sqrt{c_x^2 + c_y^2} / \vartheta t$, $\{M-W\} \rightarrow \vartheta \sqrt{c_x^2 + c_y^2} / \vartheta t$, $\{E-W\}$.

This means that the Source-charge of Electromagnetic waves are the Vectors Resultants E-W, M-W, where $W_{RX}, W_{RY} = \vartheta \sqrt{c_x^2 + c_y^2} / \vartheta t$, and $W_{RZ} = \sqrt{c_x^2 + c_y^2} = \vec{c}$, and are E - W = The Kinetic Energy and M-W = The Potential Energy which is Propagating from one Position to another without any matter being transferred.

Both are Propagated by the action of the Gravity, g, c_y which exists without mass, through Gravity-Field-medium continuously only. The Dual-Property of Particles and Waves allow Electromagnetic waves to Propagate in an definite direction and simultaneously to Propagate themselves along, and independently of the medium, and this because are created by the vibration of an electric charge $[\oplus, \ominus]$.

7b: The Total Energy in Loops [79]

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 are Not Producing Work from where then dispersion follows the Pythagoras theorem where the Resultant Quantized linear Space length, r , becomes the Resultant of Energy Vectors as follows, $r = |(\bar{c}.T)| = \sqrt{v^2 + c^2}$ and by using Space Vector $\bar{r} = |(\bar{c}.T)| = \sqrt{v^2 + c^2}$ then The total Rotating Energy is $\rightarrow \pm \bar{\Lambda} = \bar{p}.r = (M.c).r = (M.c). \sqrt{v^2 + c^2}$ and by 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 issues $E_T = E_R + E_K \rightarrow$ i.e. Total - Energy of Elementary-Particle = Intrinsic Rotational + Kinetic Energy, The velocity of Elementary Particles is the light velocity $c = v = 2\pi r. f_e$ and the frequency $\rightarrow f_e = \frac{c}{2\pi.r} \dots (a)$

Rotational Energy $\equiv$ Momentum $E_R = \bar{B}.\bar{w} = 2L = J.w^2$ and $\rightarrow E_R = [\frac{\pi r^4}{8}].[\frac{c^2}{r}] = \frac{\pi c^2}{8} r^3 = 3,53535.10^{16}. r^3 \dots (b)$

Energy and frequency of Elementary Particles can be found from cave r , only since, c , constant, and Total-Energy $\rightarrow E_T = E_R + E_K = \frac{\pi c^2}{8} r^3 + \frac{1}{2} m.v^2 = 3,535.10^{16}. r^3 + \frac{1}{2} m.v^2 \dots (c)$

The mass of Elementary Particles is $m = \frac{E}{2r^2.w^2} = \frac{J.w^2}{2} \cdot \frac{1}{2r^2.w^2} = \frac{J}{4.r^2} = \frac{\pi.r^2}{16}$, i.e. it is dependent on Radius of Cave, and for cave $r = 10^{-62}$ mass $\rightarrow m = \frac{\pi.10^{-124}}{16} = 1,935. 10^{-125} \text{ kg}$.

When The SPACE acquires ENERGY as Velocity then becomes an Energy-monad. [26] Applying Quaternion equation $[-\nabla\Lambda, \nabla x\Lambda] = 0$ for Point, O, and for constant velocity, $\bar{c}$, then issues $[-\nabla c, \nabla xc] = 0$ where $[-\nabla c] \perp [\nabla xc]$ which means that it is a Mechanism that instantly transports Breakage-masses in two directions Dynamically and Perpendicularly to all Inertial frames Layers. From their Velocity-Energy vector are Produced the Three Breakages as, $[\pm s^2 = \pm (wr)^2]$, $[\nabla i = 2(wr)^2]$, and from them subatomic Particles $\rightarrow$ Fermion and Bosons Rotating energy is $\rightarrow \pm \bar{\Lambda} = \bar{p}.r = (M.c).r = (M.c). \sqrt{v^2 + c^2}$ and squaring both sites $[\pm \bar{\Lambda}]^2 = p^2.r^2 = M^2.c^2.(v^2 + c^2) = (M^2.v^2).c^2 + M^2.c^4 = (p^2.c^2) + M^2.c^4 = [p.c]^2 + [m_o.c^2]^2$ or is $\rightarrow E_T = E_R + E_K \leftarrow$ i.e. Total - Energy of Elementary-Particle = Intrinsic Rotational + Kinetic Energy, The Dot Product and Cross Product:

For Vectors, $\bar{a}, \bar{b}$, Dot-Product happens for interactions between Similar Dimensions, while Cross-Product between Different - dimensions. Cross-Product of any two vectors $\bar{a}, \bar{b}$, is $\bar{a} \times \bar{b} = |\bar{a}|.|\bar{b}| \sin \theta. \bar{n}$ and for $\bar{a} = \bar{b}$ and $\theta = 90^\circ$ then $\bar{a} \times \bar{a} = \bar{a}^2$, and for Quaternion, s , which Performs the Work of rotating the one vector around the other $\rightarrow$ Work = $\bar{a} \times \bar{a} = \bar{a}^2. \bar{r}$, and for $\bar{a} = \bar{v}$ then, Work = $\bar{v}^2. \bar{r} = |\bar{v}|.|\bar{v}|. \bar{r} = v^2. r. \bar{n} \equiv (wr)^2 r. \bar{n} = (2\pi r/T)^2 r. \bar{n} = (4\pi^2 r^2 / T^2). r. \bar{n} = \frac{4\pi^2 r^3}{T^2}. \bar{n} = (4\pi^2 r^2. f^2). r. \bar{n}$, or(w) Work = $4\pi^2 \frac{r^3}{T^2}. \bar{n} = 4\pi^2. r^3. f^2. \bar{n}$, which is the Kepler celestial law for microcosm.

Since in Mechanics issues $z^2 = s^2 - s^2 + 2.s.s = 1$, and from Unit-quaternion $s^2 + [iv]^2 = 1$ then is $\rightarrow s^2 - v^2 = 1$ (d) Equation (d) is a Cone relation on where Total-Energy, Kinetic and Potential is conserved and for Photon, Electromagnetic radiation is the Kinetic-Energy and the Velocity-vector-Energy - tank is the Potential. Photon is an Energy-store, r , in a Stationary-wave of wavelength $n \lambda = 2r$ consisted of n stationary lobes filled in λ with inner motion the Electromagnetic - Displacement-current and Outward the Propagating, Energy-store $\lambda = 2r / n$, with the light speed, c , the two transverse fields, {the + Electric-field and the -Magnetic-field}. Equation (w) declares the relation between the Total-Energy W in caves, and the Geometry of Energy=cave Space $r \equiv [EM-R \equiv f_{1=N}, f_2, f_3, f_D, f_n]$ with a binding constant, Proved to be the g . Since constant $k = \frac{T^2}{a^3} = 9,808$ and $1 = k.f_n^2.a^3$, or $1 = g.f_n^2.a^3$, is easy to calculate any cave, using the frequency only in equation, $a = \sqrt[3]{\frac{1}{9,808.f_n^2}}$

C: THE ORIGATION OF THE PHYSICAL LOOPS $\equiv$ CAVES

1c: The Gravitation Force G , and the Kick-Start: [78-79]

From where G , is Produced? $\rightarrow$ It was prior referred that, Periodic excitation between Primary Space (+) and Anti-Space (-) may exist only as collision of Opposite, so Energy captured in Box - B_p , Planck's Loop, contains these three constitute elements $[(+), [\leftrightarrow], (-)]$ without the inner acceleration but the Material- extreme case of Periodic acceleration $[\rightarrow \leftarrow] = 0$ and which is the Reciprocating motion So, above Property of Primary Space exists also and for all Primary Complex- Spaces.

Complex Spaces either at, $[(+)]$ or $[(-)]$, constitutes may be realized, exist, separately because of the $\rightarrow$ Primary - Opposites which Pull each other $\leftarrow$ therefore the Initial Property of Attraction,

G, between Primary-Opposites continue issuing and for All the other infinite Composite and Complex Structures, as well as in all Groups of them.

Since Force G is a Uniform-Pointy-Force, therefore needs a Conductor, a Layer, a kind of mass, to be spread and act on it as Surface-force, a Layer which is the Base or the Conductor Spin, S, or the Stress g, as is the Growing-Golden-ratio-Pattern Φ .

Because of this Stress-Layer g, all the Energy-Structures Present, Reaction to any motion i.e. mass. Gravity acceleration g, is produced from the in Material-Points acceleration which is equal to the Pressure σ , and is the Conductor to all Waves as Force G - Over-Layer - A $\rightarrow [A \equiv \text{mass} * g] \rightarrow G_{\sigma} \equiv G$, and Stress $= g = \frac{\sigma^2 r^2 \cdot \Phi^2}{8}$.

From Figure -18(3) is seen that Gravitational Force is Attractive following Newton inverse square law, and it is an Attractive-force $[\leftrightarrow]$, on any two Opposite-Elements $[(+), (-)]$ realized through a Layer of Unit-Stresses $[\sigma = g]$, and becomes from a HUGE Magnet in Planck's Loop containing the whole Universe [89].

G - Kick-Start, is Planck's frequency $\rightarrow f_p = 1 / T_p = \frac{w}{2\pi} = \sqrt{\frac{1}{g \cdot a^3}}$ and in this world the How this frequency can Enter, Format and cohesive, to the first or any other Energy-Cave in Planck's length, E-Unit Monad, $1 = g \cdot f_n^2 \cdot a^3 = [\frac{4\pi^2}{GM}] \cdot f_n^2 \cdot a^3$, where $g = [\frac{4\pi^2}{GM}]$ as this was shown in [79] for Unit-Monad-relation.

An Energy-Rim = Cave is a Plane - Surface, an orbit, representing a Constant Energy becoming from the squared Frequency f_n^2 , Representing the Imaginary Part, and r_p^3 , Representing the Real-Space-Part of monad as this is from Kepler's second Law for Unit constant Energy as $1 = k \cdot f_n^2 \cdot r_p^3$.

This Stationary-Energy is spread in one Plane, as this happens for Stationary-waves in Caves, while in Propagating-Energy in Two as is the Electromagnetic Transverse waves All these Energy-Rims consist the Quantized-Plane-curves. The two different motions of $\oplus$ Space, $\ominus$ Anti-space, in any cave r, and in a Finite Space, The Revolving and Periodic Excitation Create an Eternal frequency which influence all other Spaces caves.

The minimum quantized-energy is stored in the Gravity-Layer, g, becoming from the Unit Energy of the sinus orbit. From equation, $g = T^2 / a^3$, and minimum - a then Period is $T = \sqrt{g \cdot a^3} = \sqrt{9,8076925 \cdot (2,1145016 \cdot 10^{-11})^3} = 3,04513 \cdot 10^{-16}$ s, Since the Unit-Work $\equiv$ Sine Integral $= \int_0^t \frac{\sin t}{t} dt = 1$, the semi-major axis, a, is $a = 2,1145016 \cdot 10^{-16}$ m, where frequency $T^{-1} = f_p = 3,28393 \cdot 10^{15}$ /s, corresponds to a Sphere-loop in Planck's scale as $(4 / 3) \cdot \pi \cdot r^3 = 3,96 \cdot 10^{-32}$ m³, and then the Energy in this Planck's loop is the minimum quantized. From Planck's Energy $E = h \cdot f_p = [6,6262 \cdot 10^{-34} \text{ J} \cdot \text{s}] \times [3,28393 \cdot 10^{15} / \text{s}] = 2,176 \cdot 10^{-18} \text{ J}$, and in eV becomes $\rightarrow [2,176 \cdot 10^{-18} \text{ J}] / [1,6 \cdot 10^{-19}] = 13,6 \text{ eV}$ or, Energy $\Rightarrow 13,6 \text{ eV} = h f = h / T = h / \sqrt{g \cdot a^3}$.

The above quantity of Energy consist the Hydrogen minimum Energy-Rim, which becomes from Loop-equation $a = \sqrt[3]{T^2/g} = \sqrt[3]{\frac{[3,04513 \cdot 10^{-16}]^2}{9,80769251}} = 2,1145016 \cdot 10^{-16} \text{ m}$, and it is the Energy-cave for the Unit Energy quantity. From Newtonian Constant of Gravitation relation issues, $G = E = h \cdot f_n = [\frac{c \cdot r^3}{a^3}] \cdot [g_L k_L] = g \cdot k_E = g \cdot [g_L k_L]$, and since for The First Chemical-Neutral-material-cave, r , constants g_L, k_L are equal to unity i.e. $\mathbf{g}_L = \mathbf{k}_L = 1$, then above Energy of $E = 13,6 \text{ eV}$, in Hydrogen-Plane-orbit corresponds to the minimum-Energy-Cave, or $\rightarrow$ The Physical - Quantized - Energy - Structure.

Since G Pushes $\rightarrow g$, on the Earth-Unit-coefficient, k_E , and because is the Starting for the first time beginning, of this Mechanism then from $G = g \cdot [g_L k_L] \equiv g \cdot [1 \cdot 1] \equiv \rightarrow g \leftarrow$ or $G = g$, 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 $\mathbf{k}_L$. Gravity, g , is the minimum energy becoming from the in-storages angular Velocity Acceleration $a = v^2/r \equiv 9,8076941$ in the Material-Point. [72]

Photon is a Material-point, Box B_R , with fix-ends Inward-cave r , and which is the Energy Storage $\mathbf{B}_R$, Outward - cave r is an Electromagnetic-Radiation on wavelength $\lambda = c \cdot T = c / f_p$ which EM-Radiation, carries the Box B_R .

Universal Gravitational constant $G = g \cdot k$ related to g, k_R , is a Force and through the Static g becomes the Principal stress $\pm \sigma$, or frequency f_R which exists in nature as motion in the minimum Resonance Golden-ratio-frequencies $f_R = f_n = 1$, and this because of the Periodic motion, in Excitation, where issues the Coulomb-Dipole law and which Coulomb inverse law is as, $F = k_c [q_1 \cdot q_2 / r^2] = k_c [\oplus \rightarrow \leftarrow \ominus] / r^2 = \frac{8}{\pi r(1+\sqrt{5})} [\frac{B}{r^2}]$, and the Coulomb constant $k_c = 9 \cdot 10^9 \text{ Nm}^2/\text{C}^2$, i.e. Because of the Periodic excitation between the, Space (+) and Anti-Space (-), $[\oplus \rightarrow \leftarrow \ominus]$, exists only collision of Opposite, where the inner acceleration is equal to zero Gravity g , and this because of the Material extreme-case of the Periodic acceleration $\{[\rightarrow \leftarrow] = 0\}$ which is zero, the Net force vanishes, issues the Coulomb Dipole-law where Static - Stress g , becomes from the Stationary constant Dipole moment $\bar{\mathbf{p}} \equiv \bar{\mathbf{B}} \equiv$ as momentum which is the analogous in the Revolving motion where then issues $\rightarrow G = g \cdot k = \mathbf{k}_E g = g \cdot \mathbf{k}_R \mathbf{g}_R = \bar{\mathbf{p}} \cdot \mathbf{g}_c = \sigma = \frac{\text{Force}}{\text{Area}} = \frac{\text{Mass}}{\text{Area}} g$

For Earth-System mass $M_E = 5,9723 \cdot 10^{24} \text{ Kg}$, Radius $R_E = 6378,137 \text{ Km} = 6,378 \cdot 10^6 \text{ m}$, then Earth-constant $\mathbf{k}_E = \frac{R_E^2}{M_E} = \frac{[6,378 \cdot 10^6]^2}{5,98 \cdot 10^{24}} = 6,8115518 \cdot 10^{-12}$ and $G = g \cdot \mathbf{k}_E = [9,8076941] \cdot 6,8116 \cdot 10^{-12} = 6,68056 \cdot 10^{-11} \text{ m}^3 / \text{N} \cdot \text{s}^2$ becoming from $g, \mathbf{k}_E$ only, i.e. G as force pushes $\rightarrow g$ as Stress energy in $\rightarrow \mathbf{k}_E$ constant.

Now is Proved that, the Gravitational Constant G is the mechanism or the mould, for the First-kick-Start upon this Unit-Granular-Energy-Stress-Layer, g , in order 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 $13,6 \text{ eV}$.

The Centripetal acceleration in Photon cave due to Pressure σ , where issues only Rotational Energy $E_R = \bar{B} \cdot \bar{\omega} = 2L = J \cdot \omega^2$, and $2E = B f$, or $\rightarrow 2 \cdot (0,5 \cdot m \cdot c^2) = m \cdot c^2 = 0,5 \cdot \pi \cdot r^4 \cdot c^2 / 4$, and, $4 \cdot \bar{B} \cdot f = c^2 \cdot r^4$, where the Golden ratio frequencies $\rightarrow f_n = \left[\frac{n \cdot \sigma \cdot \Phi}{2 \cdot \pi \cdot r} \right] \equiv \frac{n \cdot (1+\sqrt{5}) \cdot \sigma}{2 \cdot \pi \cdot r} = c^2 \cdot r^4 / 4 \cdot \bar{B} = \frac{E}{h} \leftarrow$ i.e. The box B_P , or the Planck's Cave, carried with Light velocity c and Pressed into the Planck's Loop, as $n \cdot c^2 = n \cdot c \cdot c$, becomes the Gravity g , which is a stress by which Gravitational-force G is communicating as, $g_G = \left[\frac{\pi \cdot r \cdot v^4}{2} \right] \cdot e^3 = 9,808238 \text{ m/s}$.

Gravity is the minimum Unit-Stress-monomer in Planck's scale becoming from a M-Point and which is Under -Planck's - length region. Since also acceleration in a Material-Point (Centrifugal-Centripetal) becomes from the Principal Stresses $\pm \sigma$, therefore constant $g_G \cong \pm \sigma = \frac{\text{Force}}{\text{Area}} = \frac{g \cdot \text{Mass}}{\text{Area}} = \frac{G}{k}$, and for Unit-G constant k becomes, $k = \frac{\text{System Area}}{\text{System Mass}} G$ where $\rightarrow \frac{1}{g} = \frac{k}{G} = \frac{\text{System Area}}{\text{System Mass}}$ and $G = k g_G$, and for the Earth $G \equiv g \cdot k_E \equiv g \cdot [g_L k_L] \equiv \left[\frac{T_P^2}{a^3} \right] \cdot [g_L k_L] \equiv 9,808238 \cdot 6,8116 \cdot 10^{-12} \equiv 6,68056 \cdot 10^{-11} \frac{\text{m}^3}{\text{Ns}^2}$.

So, G , is The Pulling and Cohesive Force on all the Quantized-Energy-Structures which communicates with everything due to Periodic excitation on all Spaces. From equation $g = G / [g_L k_L]$, is seen that g becomes from G under Local-laws, And also, Gravity g , is the Unit-Energy-Path, Quanta of Gravitation, due to M-Point Frequency $f_g \cong \pm \sigma$ from the Revolving motion, and also the Unit-Energy-Stress per Surface and for the Force - G , is the Permitted Path, or the communication Conductor on all Energy Wave Structures, In and Out Planck's length.

Remarks : Gravitational Force, G , is the Pressure which every Object in the Universe Exerts on every other, whether small or big and is equal to $F_{\text{grav}} = \frac{G \cdot M \cdot m}{d^2} = \frac{g \cdot R_E^2 \cdot M \cdot m}{M d^2} = \frac{g \cdot R_E^2 \cdot m}{d^2} = \frac{m g \cdot R_E^2}{d^2}$, and $G = \frac{g \cdot R_E^2 \cdot M \cdot m \cdot d^2}{M d^2} = \frac{g \cdot [R_E^2]}{M} = g \cdot k_E$, where $k_E = \frac{[R_E^2]}{M}$, and g = The minimum Quantized work as acceleration $\equiv 9,8076941 \text{ m/s}^2$, k_E = The Earth Local-coefficient between the two constants g , G .

For Earth (E) $\rightarrow k_E = r_E^2 / m_E$, For Bodies (B) $\rightarrow k_B = r_B^2 / m_B$, For any Body $\rightarrow$ Local Gravity $g_L = k_E / k_L$ From relation $G = g \cdot k_E = 9,8076941 \cdot 6,8116 \cdot 10^{-12} = 6,68056 \cdot 10^{-11} \text{ m}^3 / \text{Ns}^2$ and from relation $1 = c \cdot r^3 \cdot f_P^2 \rightarrow f_P = \sqrt{1/cr^3}$ and from $f = E/h$ then $\frac{E}{h} = \sqrt{1/cr^3}$ or $\rightarrow E = h \cdot \sqrt{1/c \cdot r^3}$, $\frac{E^2}{h^2} = \frac{1}{cr^3} \rightarrow$ and, $E^2 = \frac{h^2}{c r^3}$, an Energy relation between c , r .

Instances: [77]

For Earth-System mass $M_E = 5,9723 \cdot 10^{24} \text{ Kg}$ and for Area $\rightarrow$ Radius $6378,137 \text{ Km} = 6,378 \cdot 10^6 \text{ m}$ then the Earth-constant $k_E = \frac{[6,378 \cdot 10^6]^2}{5,9723 \cdot 10^{24}} = 6,8115518 \cdot 10^{-12}$ and $G = g \cdot k_E = 9,8076941 \cdot 6,8115518 \cdot 10^{-12} = 6,6805616 \cdot 10^{-11} \text{ m}^3 / \text{Kg} \cdot \text{s}^2$ i.e. Gravitational-constant G becomes from g , k_E , and issues $G = 6,6805616 \cdot 10^{-11} \text{ m}^3 / \text{Ns}^2$ (7)

For Black-Holes-System mass $M_{BH} = 4,0.10^{52}$ Kg and for the Area Radius $3,08.10^{25}$ m, then Black-Hole-constant $k_{BH} = \frac{[3,08.10^{25}]^2}{4,0.10^{52}} = 2,3716.10^{-2}$ $g_{BH} = \frac{k_E}{k_{BH}} = 6,81155.10^{-12} / 2,3716.10^{-2} = 2,872.10^{-10}.g_E \rightarrow$ i.e.

For Earth-Unit-coefficient $k_E = 6,81155.10^{-12} \rightarrow$ Black-Hole -Unit-coefficient $k_{BH} = 2,3716.10^{-2}$ m²/Kg, and Gravity acceleration of a Black-Hole is, $g_{BH} = 2,872.10^{-10}.g_E$, an expected explanation.

For all Planes issues $G = k_E g = g.k_L g_L$, and for Black-holes also where, $G = g.k_{BH} . g_{BH} = 9,8076941 * 2,3716.10^{-2} * 2,872.10^{-10} = 6,6805616 * 10^{-11}$. Meaning that Gravitational constant is the Same for all Systems.

The Gravitational Force, G, is the Pressure which every Object in the Universe exerts on every other, whether Small or Big and from Newton are equal to $\rightarrow F_{grav} = \frac{G.M.m}{d^2} = \frac{g.R^2_E M.m}{Md^2} = \frac{g.R^2_E.m}{d^2} = \frac{mg.R^2_E}{d^2}$, $G = \frac{g.R^2_E M.m.d^2}{Md^2} = \frac{g.[R^2_E]}{M} = g.k_E$ where $k_E = \frac{g.[R^2_E]}{M} = \frac{g.M}{G}$, g =The minimum Quantized Work as change of velocity acceleration $\equiv 9,8076941$ m/s²

k_E = The Earth Local-coefficient between the two Constants, g, G, and $k_E.G = g.M$. For Earth (E) $\rightarrow k_E = r^2_E / m_E$, For Bodies (B) $\rightarrow k_B = r^2_B / m_B$, For any Body $\rightarrow$ Local Gravity $g_L = k_E / k_L$

- 2.. Coulomb Electrical Force, $F_{electron} = k_C \frac{Q_1.Q_2}{d^2} = \frac{[\oplus \rightarrow \ominus]}{d^2} = \frac{8}{\pi r(1+\sqrt{5})} \left[\frac{B}{r^2} \right]$, where Coulomb constant $k_C = 9.10^9$ Nm²/C²
- 3.. The Work done by the Electric field to Rotate the Dipole is $W = F_{electron} . E_{Field}$.
- 4.. The Work done in Material Point needs a Path to exit from the Box $f_R = [B_{PH}] \equiv [f_{1=N}, f_2, f_3, f_R = w^2_N] \equiv [E^2 + H^2]$, and from where is Propagated. Resonance-Path happens as the Force, EM-Radiation in Two directions, which can travel in any closed System, and for solids 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 System [+ - 0] and Change the Inner-Structure of this System to another or Destroy it.

In [70], the Work Produced In Material-Point $\overrightarrow{AB}$ is equal to $\rightarrow W = 2L = \overline{B} . \overline{w} = J.w^2 \leftarrow$ consisting the First-Energy-Store which is a Stationary Wave with, n lobes as, $W_{n(n+1)} = \left[\frac{4\pi r^2 f_1}{3} \right].n.(n+1)$ and wavelength $\lambda_N = \frac{\sigma.(1+\sqrt{5})}{4\pi r} = \frac{n.\overline{B}}{4\pi r^2} = \frac{2n.c}{w}$ of $r = \frac{m.c}{q.B}$ related to M-Field B. In [75-B], The Permeable-Resonance-Path for M-Point is $\rightarrow$ The Resonance-frequencies $f_R [S \equiv f_{1=n}, f_2, f_R = w^2]$ with $f_n = [n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{n\sigma.\overline{B}}{8r^2}]$ related to Spin $\overline{B}$, Stress σ and cave r. Since frequency in Material-Point is $\rightarrow f_n = \left(\frac{n\sigma}{8r^2} \right) . \overline{B} \equiv \left[\frac{1+\sqrt{5}}{2} \right] \frac{\sigma}{2\pi r} \equiv \left[\frac{n\sigma}{8r^2} \right] . \overline{B} \equiv \left[\frac{1+\sqrt{5}}{2} \right] \frac{Stress}{Perimeter} \equiv \left[\frac{1+\sqrt{5}}{2} \right] \frac{Force [N]}{Area * L[m^3]} \equiv \frac{E}{h}$, then it occupies the Property of the Golden-ratio Pattern Φ , and equation defines that the Material Point of frequency f_n , when collide with another Material Point, or with any other Particle or Particles then Produces another monad as $\rightarrow 1 \equiv$ A New Quaternion and the first continuous to be of the same Identity, frequency f_n , as before and from Euler's, Rigid Body

Dynamics work is $\rightarrow W = 2L = \bar{B} \cdot \bar{w} = J \cdot w^2 \equiv h \cdot f_n \leftarrow$ i.e. The Frequency of Photon, is embodied with the $\rightarrow$ Growing-Golden-ratio-Pattern Φ and It Uses the Vibrating Physical Structures, or the same the Granular Material-Instruments to Kick - Start all of them and everything in this world. The How In [75-B] Page 34.

Because of the Periodic excitation between, Space (+) and Anti-Space (-), $[\oplus \rightarrow \leftarrow \ominus]$ exists only Collision of Opposite, where the inner acceleration is equal to zero Gravity g and this because of Material extreme-case of the Periodic acceleration $\{[\rightarrow \leftarrow] = 0\}$, and which is zero and the Net force vanishes, and in where issues The Coulomb Dipole-law and where acceleration g becomes from the Stationary constant Dipole moment $\bar{p} \equiv \bar{B} \equiv$ momentum and which is the analogous in the Revolving motion in where then issues $\rightarrow$ Gravitational force $\Rightarrow G = g \cdot k = \mathbf{k}_E \cdot g = g \cdot \mathbf{k}_R \cdot \mathbf{g}_R = \bar{p} \cdot \mathbf{g}_c = \sigma = \frac{\text{Force}}{\text{Area}} = \frac{g \cdot \text{Mass}}{\text{Area}}$

In Page-33, the Earth-constant $\mathbf{k}_E = \frac{R_E^2}{M_E} = \frac{[6,378.10^6]^2}{5,98.10^{24}} = 6,811551810^{-12}$ and the Gravitational Force $G = g \cdot \mathbf{k}_E = [9,8076941] \cdot 6,8116.10^{-12} = 6,68056.10^{-11} \text{ m}^3/\text{N.s}^2$ becoming from $g, \mathbf{k}_E$ only, i.e. G is a force which Pushes $\rightarrow g$ as energy in $\rightarrow \mathbf{k}_E$.

From Gravity relation $G = g \cdot \mathbf{k}_E = 9,8076941 \cdot 6,8116.10^{-12} = 6,68056.10^{-11} \text{ m}^3/\text{N.s}^2$ and from Energy-loop relation $1 = c \cdot r^3 \cdot \mathbf{f}_p^2 \rightarrow \mathbf{f}_p = \sqrt{1/cr^3}$, from $f = E/h$ then $f = \frac{E}{h} = \sqrt{1/cr^3}$ or $\rightarrow E = h \cdot \sqrt{1/cr^3}$, and $\frac{E^2}{h^2} = \frac{1}{cr^3} \rightarrow E^2 = \frac{h^2}{cr^3}$, an Energy relation between the, c, r . This relation is used for Black- Holes Energy where r , result to zero, [71]

The Permissible - Permeable - Resonance - PATHS is as below for the MEANS,

1. Solids $\rightarrow$ The Normal-mode-Vibration - System $\{-w^2 [M] + [K](X)\} = 0$
2. Liquids $\rightarrow$ The Cauchy Stress-Tensor as Momentum equation $\{\nabla \cdot \sigma = -\nabla p + \nabla \cdot \tau\}$
3. Gases $\rightarrow$ The combined Avogadro's Pressure-law $\{PV = nRT = n \cdot mv^2/3\}$
4. Crystals $\rightarrow$ The Cauchy Ellipsoid-Stress-tensor where $\{E \perp B \perp r \equiv \sigma_1 \perp \sigma_2 \perp \sigma_3\}$
5. Molecules $\rightarrow$ The Lattice-Crystal-Arrangement with their Chemical Bonds relation
6. Atoms $\rightarrow$ The Energy-Rims with Chemical Bonds, Ionic, Covalent, relation
7. Particles $\rightarrow$ The Resultance of the One-Dimensional-Collision $\bar{v}_{ij} = \bar{v}_j - \bar{v}_i = \bar{w}_{ij} \cdot \bar{r}_{ij}$
8. M-Points $\rightarrow$ The Resonance-frequencies $\mathbf{f}_R [S \equiv f_1 = n, f_2, f_3, f_R = w^2] = \mathbf{f}_n = [\oplus \leftrightarrow \ominus] = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{n \cdot \sigma \cdot \bar{B}}{8r^2} \rightarrow$ i.e. the Golden-ratio-Pattern, which is related to Spin.
9. Cave-Orbit $\rightarrow$ The Relation $c \cdot L_s = L_v$, Light-velocity $3 \cdot 10^8 \text{ m/s} \cdot 1 \cdot 10^{-42} \text{ m}$ cave $= 3 \cdot 10^{-34} \text{ m}^2/\text{s}$ are the Cave-Energy-Plane-Rims in Atom's, Planet orbits.

In Vibrations of Systems, for Orbits issues $\rightarrow W = 4\pi^2 \cdot \frac{r^3}{T^2} \cdot \bar{n} = 4\pi^2 \cdot r^3 \cdot \mathbf{f}_p^2 \cdot \bar{n} \leftarrow$ which is the Energy in the Conic-Sections of Kepler's Unit - Orbits.

The Energy-Storages $r = n \cdot [\frac{\lambda}{2}] \equiv W_{n(n+1)} = [\frac{4\pi r^2 f_1}{3}] \cdot n \cdot (n+1)$, are travelling through Bodies and follow, Lamé Stress Ellipsoid $n_1^2 + n_2^2 + n_3^2 = \frac{T_1^2}{\sigma_1^2} + \frac{T_2^2}{\sigma_2^2} + \frac{T_3^2}{\sigma_3^2} = 1$ on Principal Stresses $\pm \sigma_1, \pm \sigma_2, \pm \sigma_3$, which is the Passage through which Forces (The EM-Radiation) travel in any Solid either

it is in Motion or is at Rest. Laplace's Orbital Angular-momentum $e^{i.2\pi n} = 1$ and for $n = 0, \pm 1, \pm 2, \pm 3, \dots, \pm n$, consist the eigenvalues operator L_z which agree with prior Resonance-frequencies $\mathbf{f}_R$ [$S \equiv f_{1=N}, f_2, f_3, f_R = w^2$] as wavelengths $\lambda \equiv [f_1, f_2 \dots f_n = w^2] \equiv$ the n lobes, or $\rightarrow f_N = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{n\sigma.B}{8r^2}$, as the Principal-Stresses σ , and the Resonance-frequencies $\mathbf{f}_R$ relation, which is Energy stored in the MP-lobes. [70]

Type - Particles at sites - Type of Bounding-Force - Properties - EM-Radiation

Ionic: $\oplus, \ominus$ Ions - Electrostatic $\oplus \leftrightarrow \ominus$ - non-conductors - Infrared

Molecular: Atoms or Molecules - Dipole Attraction - Repulsion - non-conductors - Chemical-Bonds.

Covalent: Atoms - Network- Bonds between Atoms -non-conductors - EM-Spectrum

Metallic: Atoms - Ions and Electrons Attraction - Conductors - E-conduction.

The Kinetic-Energy E_K of a moving Material-Point, as this is the Photon, is stored as motion in its Storage, $r = [n. \lambda/2]$, with the n frequencies $f_n = n.f_1$, with the n lobes, and with an 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 exists $E \perp B \perp r \equiv \sigma_1 \perp \sigma_2 \perp \sigma_3$, in-where Energy Propagates along Directions without any Birefringence, and carries the Energy-Storage r , which radiation is The Conveyer.

Above procedure can be used in Cells, where cells are cases of an Birefringence material and the Resonance-Passage happens as the Force, an EM-Radiation in Two directions, can travel in Cell through Cauchy-stress-tensor where the two Conveyers $E \perp B \perp r \equiv \sigma_1 \perp \sigma_2 \perp \sigma_3$, and can carry the Energy-Storage, r , in Cell, and alter the Inner-Structure of Cell to another desirable Property. From Inner-velocity equation $v = w r = (2\pi/T).r = 2\pi.f_1 r$, wavelength $\lambda = cT = c / f_1$, cave $r = n.[\lambda/2]$, then $r = n.(c/2f_1)$ and $v = 2\pi.f_1 [n.c/2f_1] = n.\pi.c$ or $v = n.\pi.c \dots (4)$ showing that velocities in lobes are, $n.\pi$, times that of light and for $n = 1$ then $v = \pi.c$, more than three times faster of light velocity. Because of the above velocity v E field is produced which produces the $\partial D / \partial t$ field and in turn produces the H field which produces the $\partial B / \partial t$ field and which again produces the E field, i.e. the total EM-field regenerates itself as it rotates, and is a Phenomenon happening in a Propagating Plane-wave. So Its Permeable - Resonance - Path is impossible in an three-times stronger EM-field.

2c: The United-Coulomb-Newton Law for Interactions

For a Stationary interaction the Coulomb-Law-Force is $\mathbf{F}_C = \frac{k[\mathbf{q}_1 \mathbf{q}_2]}{r^2}$, and for Charges $\mathbf{q}_1, \mathbf{q}_2$ where Constant $k = 9.0.10^9 \text{ N.m}^2/\text{C}^2$, and r , is the distance between the Charges.

For a Stationary interaction Newton Law for masses m_1, m_2 is $\mathbf{F}_N = \frac{G[m_1 m_2]}{r^2}$, and for $\bar{v} = \bar{r}$ Conjugating Interaction, Energy $E = \frac{v^2}{2}[m_1 + m_2] = \frac{r^2}{2} [\frac{F_1}{g} + \frac{F_2}{g}] = \frac{F.r^2}{2} [\frac{1}{g} + \frac{1}{g}] = \frac{F.r^2}{2} = \frac{F.r^2}{2} [\frac{2.g}{g^2}] = \frac{F_N.r^2}{g}$, where $\mathbf{F}_N$ is Newton Force, and E is the Energy of the Field-System $[\frac{g+g}{g*g}]$.

Equating the two forces then $\frac{k[q_1 q_2]}{r^2} = \frac{gE}{r^2}$, or $\Rightarrow k[\mathbf{q}_1, \mathbf{q}_2] = g.E \dots\dots(1)$ Equation (1) relates any two Charges q_1, q_2 , with Field-Energy E , under vector $\bar{\mathbf{v}} = \bar{\mathbf{r}} = \bar{\mathbf{c}}$

3c: The Origination of Light Velocity c

Gravity $g \equiv \frac{T^2}{a^3} \equiv \frac{1}{f^2 n a^3} \equiv 9, 8076941 \rightarrow$ The minimum Granular Quantized Energy, The Forces Beyond-Planck-Length are $\rightarrow F = \Phi^3 \cdot [\oplus \sigma \ominus] = \sigma \times \Phi^3 \leftarrow (1)\text{-}[87]$

Force G acts $\rightarrow$ on Spinning M-Points on $\bar{\mathbf{S}}$ through $\bar{\mathbf{g}} \rightarrow$ on Planck's - $\bar{\mathbf{B}} \rightarrow$ on $\mathbf{g}_G$, through the Resonance frequency $\mathbf{f}_R$. It was proved that $G = \sigma \Phi^3$, and $\sigma = \frac{G}{\Phi^3} = \frac{G \cdot \sigma^3}{c^3}$, or $\rightarrow \sigma^2 G = c^3 \dots(2)$, where σ is a Stress between the frequencies. From Force-relation $F = \sigma A = (2\pi f r) \frac{A}{\Phi} = w r \frac{A}{\Phi} = \bar{\mathbf{v}} \frac{A}{\Phi}$, is seen that force G becomes a velocity $\bar{\mathbf{v}}$. In the case of Planck's length this velocity is $\bar{\mathbf{c}} = w r = \frac{\sigma \cdot \Phi}{r} \mathbf{r}_p = \sigma \times \Phi = \left| \frac{G L_P}{r \Phi^3} \right| \Phi = \left[\frac{G L_P}{r \Phi^2} \right]$ and from Gravity relation $G \equiv \sigma \times \Phi^3$, then issues $\rightarrow [\bar{\mathbf{c}} = \frac{G L_P}{r \Phi^2}] = [\bar{\mathbf{c}} = \frac{2 G L_P}{\lambda \Phi^2}]$ which is the Light-velocity vector.

Since r , becomes from the Beyond-Planck's-Region then $\Rightarrow \bar{\mathbf{v}} = \frac{F \cdot \Phi}{A} = \left[\frac{G \Phi}{A} \right] \dots\dots(f)$ Equation (f) may be written as Force $G = \bar{\mathbf{v}} \frac{A}{\Phi}$, which is a Viscus-Damping-Force where $\frac{A}{\Phi}$ is a constant of Proportionality and the equation of motion is $\mathbf{F}_G = \left[\frac{A}{\Phi} \right] \cdot \dot{\mathbf{x}}$

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 $\mathbf{L}_p = e^{i \cdot (\frac{\pi}{2} + 2k\pi) \cdot b}$, where from Material-Geometry [24-58], Space $\equiv 1$ and Anti-Space $\equiv \sqrt{-1} = +1, -1$, and $\sqrt{-1} = i =$ The Imaginary Part into the $\rightarrow$ Anti-Space + Space $\equiv$ motion $\equiv i \equiv \sqrt[2]{-1} \equiv \sqrt[4]{-1} \equiv e^{-i \cdot (\frac{\pi}{4}) \cdot b} = 0,707106781 \cdot b$.

The Base b , which for Natural logarithms issues $\ll$ The Natural logarithm $\ln(x)$ of a Magnitude x , is the Power to which, e , would have to be raised to equal $x \gg$, and is Defining that $\rightarrow \ln(x)$ is the Period-needed to Grow x , as this is in Integration $\int x$, so e^x is the Amount of Growth after Period x and the Possible-Repetitive-Permutations for moulds and elements in which issues **Mould**^{Elements} = The -Growth-Periods i.e.

when Mould = Elements then is succeeded maximum and for e is e^e , and any $\log_x x$. For $\log_x x$ and Base $x = 10$ then $\log_{10} 10 = 10^{10}$ and for the two elements $[\oplus, \ominus]$ is $10^{[10]^2} = 10^{20}$ Positions $\equiv$ Distances $\equiv r$ and since $10^{-x} = \frac{1}{10^x}$ then $b = 10^{-20}$, and The Anti-Space + Space-Positions are, $0,707106781 \cdot 10^{-20} = 1, 0707106781 \cdot 10^{-19}$.

In this Way The Non-Dimensional-number $[0,707106781 \cdot 10^{-1} = 0, 0707106781]$, Is Quantized in cave, r , as distance and Becomes The-Dimensional-Space in the Decimal - System $b = 10$ as cave r , and which cave is $r = 1, 0707106781$ or, $r = 1, 0707106781$ m, having Unit-Area $\pi \cdot r^2 = 3.601588 \text{ m}^2$, and the QUA-Universe is $A = 3.601588 \cdot 10^{-19} \text{ m}^2/\text{s}$, which are The Space +Anti-Space Positions in Universe...(i)

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

Force $G \equiv$ motion, exists without mass and is Quantized $\rightarrow$ Spread in {Space and Anti-Space} or $\equiv$ QUA $\equiv$ {is The Quantized-Units in-Area of Space and Anti-Space}, and as a Mould Φ Golden-Ratio, exists in the Impedance b .

Impedance in Mechanics is the Friction Coefficient, where for Force G to be Proportional to the Light-velocity $c = \bar{v}$, then the Harmonic – Oscillation is an Dumped-Oscillator, and Can-Oscillate due to the excitation as,

- 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 $\bar{c}$, [49]
- With Undamped case frequency and Decay to the Equilibrium-Position without oscillation and The Over-Damped-Oscillator Originating the n -times velocity c . What is Quantization of motion and Impedance is analytically referred in [83]. A Parallel Solution becomes also from the Attendant Geometry logic for the QUA,

The Three Elements $\equiv$ Digits of Material-Geometry are $\rightarrow \{\oplus, [\oplus \leftrightarrow \ominus], \ominus\} \equiv [+0, -] \leftarrow$ The Permutation, arrangement of the Two-Elements $P_1^2 = 2$, i.e. are $\rightarrow [\oplus, \ominus] - [\ominus, \oplus] \leftarrow$ The Three-Elements in Space need $P_1^3 = 3 \cdot (3-1) \cdot (3-2) = 6$ Positions and the same for Three-Elements in Anti-Space need $P_1^3 = 3 \cdot (3-1) \cdot (3-2) = 6$ Positions, and Total Places $\rightarrow P_1^3 \cdot P_1^3 = 6 \times 6 = 36$ Positions for Spaces and Anti-Spaces as Impedance, and from Logs for $\log_x x$ and Base $x = 10$ then $\log_{10} 10 = 10^{10}$ and for the two Elements $[\oplus, \ominus]$ the Growth is $10^{[10]^2} = 10^{20}$ Positions $\equiv$ Distances $\equiv r$, and since issues $10^{-x} = \frac{1}{10^x}$ then $b = 36 \cdot 10^{-20}$, and $\Rightarrow \bar{v} = \frac{F \Phi}{A} = \left[\frac{G \Phi}{A}\right] = \left[\frac{6,673692 \cdot 10^{-11} \cdot 1,6180339887}{36 \cdot 10^{-20}}\right] = 2.9795163 \cdot 10^8$ m/s i.e. The Ubiquity of Material-Geometry in Electromagnetism is Everywhere.

The 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 Gravitational equation $G = k_E g = g[k_R g_R]$ 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 are as $\sigma = \frac{F}{A} = \frac{2\pi r f}{\Phi} = \frac{w r}{\Phi} = \frac{v}{\Phi}$, 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, $\bar{B}$, is equal to spin S , because it is following the Stationary - Wave - Nodes - Principle in the Material-Point creates the minimum quantized Energy which is conserved in lobes. This Property is extended also to the Number of lobes as well as to, π , number as velocity $\{v = n \cdot \pi \cdot c\}$ which is the minimum

Number relating Lines and Surfaces. The Analogous happens in equation when $v = c$, and $\rightarrow r = c$.

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 velocity $v = 2\pi.f_1.[n.c / 2f_1] = n.\pi.c$ or $v = n.\pi.c \dots (\pi)$

Equation (π) shows that velocities in lobes are, $n.\pi$ times that of light, following, π , number in circle, i.e. in Material-Points exist velocities multi-times that of light and the minimum Surface-constant, Unit π , or the Growth of the velocity-vectors occurs in lobes by following the logarithm laws of Energy-constant c which is acting on Space constant π .

From velocity, $v = n.\pi.c$, 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]

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

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

Markos M-Spaces $\rightarrow$ Explain the WHY by filling the Gap with a Double-Ocean of the Pointy-Spinning - Material-Points, becoming from the Stationary - Material-Points, Photons or Electrons, and from the moving-Energy- Storages, the Photons, which Orientate and Re-orientate the Stationary-Spins, The A-Momentum, and explain the HOW and the WHY all motions follow the ubiquity of the Electromagnetism starting from the Primary- Material-Points, Photons, which through the Golden-Ratio-frequency Growth effect and conserve the Whole of the Natural-World from microcosm to macrocosm.

Gravitational-Force G , Acting in the Beyond - Planck - Cave, and on the light Velocity Vector $\bar{c}$, creates Electron-Charge $\bar{q}_{\text{Electron}} = \frac{G}{c\sqrt{2}} = 1,574.10^{-19}$ C. which agrees with that of Coulomb's charge $\bar{q}$, and the Material-Points $\bar{q}_{\text{Photon}} = \frac{G}{\sqrt{2}.f}$ 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 prior referred Ocean of Spins $\bar{g}$, and which Oriented-Spins Originate the Gravity $\bar{g} = [\downarrow = \cup]$, and the Antigravity - $g = [\uparrow = \cup]$ as Electron $\bar{e}$ [72]. The Light-Velocity $\bar{c}$ of Photons becoming from the Action of G on Planck's Length, when act on a-cave, $r = \frac{h}{c.z_c} \neq \mathbf{L}_P$ then originates the Hydrogen-cave. [99]

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

The Four Energy-Space Constants in Nature are, $\mathbf{L}_P \equiv e^{-i.(\frac{\pi}{2}+2k\pi).b} \equiv e i.(-5\pi/2).10 \equiv e i.(-5\pi/2).10 \equiv \{\sqrt{3}.\pi. 1,616199.10^{-35} \text{ m}\} \rightarrow$ and is The Planck's length cave, $g \equiv \frac{T^2}{a^3} \equiv \frac{1}{f_n^2 a^3} \equiv 9,8076941 \rightarrow$ The minimum Granular Quantized Energy, from the gravity frequency f_g , representing the Bedding-Quantum-Raw-material of force G , on all Energy structures. $G \equiv g.k_E \equiv g.[g_L k_L] \equiv [\frac{T_P^2}{a^3}].[g_L k_L] \equiv 9,8076941 * 6,8116.10^{-12} \equiv 6,68056.10^{-11} \text{ m}^3 / \text{N.s}^2$ The Pulling

and Cohesive Bond, of all the Quantized-Energy-Structures in all Spaces. $\mathbf{f_n} \equiv \{[S \equiv B_p \equiv EM-R \equiv f_{1=N}, f_2, f_3, f_D, f_n] \equiv n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{n\sigma \cdot \bar{B}}{8r^2}$ and from cave $\lambda_N = \frac{4\pi \cdot r \cdot c}{n\sigma \cdot (1+\sqrt{5})} = \frac{\pi^2 \cdot r^4 \cdot c}{n \cdot \bar{B}} \}$, The Amount of Energy, the Unit meter of motion, in the Torsional and Resonance-Augmented-Golden-Ratio-Pattern Φ , and $\bar{v} = \bar{c} = \sigma$. $\Phi = \frac{F}{A} \Phi = [\frac{G \Phi}{A}] = [\frac{6,673692 \cdot 10^{-11} \cdot 1,6180339887}{36 \cdot 10^{-20}}] = 2.9985163 \cdot 10^8$ m. Caves-Total-Energy $\rightarrow E_T = E_R + E_K = \frac{\pi c^2}{8} r^3 + \frac{1}{2} m \cdot v^2 = 3,535 \cdot 10^{16} \cdot r^3 + \frac{1}{2} m \cdot v^2$

4c: The Origination of Electron-charge $\bar{e} \equiv \bar{q}$

From relation $G \equiv g \cdot k_E \equiv g \cdot [g_L k_L] \equiv [\frac{T^2 P}{a^3}] \cdot [g_L k_L] = g k$, is seen that Gravitational-Force G , is The Spring-like central-force from a fix Point, the Source, on an attached, probe, mass as $\rightarrow F = -k r = -k r \cdot \bar{r}$, as the 1-DOF equation, $\ddot{r} + \omega^2 r = 0$, where $k =$ The Unit-Spring-Force $\equiv$ [meter of area].[meter of force $\equiv$ stress] $\equiv \pi g \equiv$ with a general solution $r = A \sin \omega_n t + B \cos \omega_n t$, where A, B are constants and evaluated from the initial velocity-conditions which become $r = [\dot{x}(0) / \omega_n] \cdot \sin \omega_n t + x(0) \cdot \cos \omega_n t$.

Above equation represents the Natural-frequency of the Celestial-Structures, and for Planck's length the only one Primary-Particle occupying the less frequency and Negative-charge, which is the electron equation and with the solution as, $\frac{\omega_n}{2\pi} = \mathbf{f_e} = \frac{1}{2\pi} \sqrt{\frac{k}{m}}$, or $4 \pi^2 f_e^2 \cdot m_e = k = \pi g$ and or $\rightarrow \mathbf{m_e} = \frac{g}{4 \pi f_e^2}$

From Planck's min-equation $f_e = E / h = [-13,6 \times 1,6 \cdot 10^{-19} = 2,176 \cdot 10^{-16} \text{ Joule}] / [6,6262 \cdot 10^{-34} \text{ J.s}] = 3,283998 \cdot 10^{16} / \text{s}$, where in Hydrogen atom energy $E = h f = -13,6 \text{ eV}$ Substituting all the minimum-meters of Planck's scale then, Electron mass is,

$$\mathbf{m_e} = \frac{g}{4 \pi f_e^2} = \frac{9,808238}{4 \cdot \pi \cdot [3,283998 \cdot 10^{16}]^2} = -7,2373149 \cdot 10^{-30} \text{ kg} \dots\dots\dots (4b)$$

$$\mathbf{f_e} = 3,283998 \cdot 10^{16} / \text{s}, \text{ and Loop } \mathbf{L_e} = 2,3762992 \cdot 10^{-16} \text{ m} \dots\dots(4c)$$

Relation $4\pi^2 f_e^2 \cdot m_e = k = \pi g$, denotes that Electric-field generated by an electron has both, a component oscillating at the Electron's - Compton - frequency $\mathbf{f_e}$, which is The Energy-Part, and the Non-oscillating component, the Electric-field-lines as the Energy-Conductor The Space-Part, which is connecting Gravity with Electric-field.

So, Electron, is the minimum-Energy massive Particle in Hydrogen-cave $\{-13,6 \text{ eV}\}$, becoming from Material-Point In Planck's-length, minimum-cave, occupying the less Unit frequency in Planck's - Length, with Negative-charge $\{\mathbf{f_e} = 3,283998 \cdot 10^{16} / \text{s}\}$.

Because of the Negative-Energy in Hydrogen-cave, and the less-Negative Energy of Rims which consist the Plane-traces-Conductors or the Paths in-where electrons roll so Energy Rims consist the Energy-minimum-Paths in Hydrogen-cave-Potentials, as $E_n - E_{n-1} = [m_e \cdot v^2] \cdot [2n-1]$, where the electrons, the Electric-Charges, roll.

Electron Charge $\bar{q}$ Becomes from Magnetic Field M which creates the Electric-Field E , which is acting on Charge q , and the acting Force per second creates Work which is conserved and coincide with the Planck's constant h . This is because $h \rightarrow J \cdot s = N \cdot m \cdot s = \text{Power}$, where from, Energy = Power x Time, issues the Beyond Planck's length L_P , and The Voltage V as $\rightarrow \bar{q} \equiv \frac{K_E}{V_P=1} = \frac{m_e c^2}{2} = \frac{g c^2}{8\pi f^2 \cdot 1}$, and $\bar{V} \equiv V_P \equiv \frac{c \cdot \text{Charge}}{\text{Total-Energy}=h} = \frac{c \cdot \bar{q}}{h} \dots (1)$

Using the two Energy-equations for Linear-motion $\rightarrow f_n = \frac{1}{2\pi} \sqrt{\frac{k}{m}}$ and Orbital-motion $a = \sqrt[3]{\frac{1}{k \cdot f^2}}$, for Unit-Energy-Space-frequency $k = g$, $a = \pi$, then $\rightarrow g \cdot f^2 \cdot \pi^3 = 1 \dots (2)$

Frequency $f_n = \sqrt[2]{\frac{1}{g \cdot \pi^3}} = \sqrt[2]{\frac{1}{9,808238 \cdot \pi^3}} = 1,8133418 \cdot 10^{-3}$, i.e. The Unit-Charge-Cave, $\bar{q}$ into Hydrogen cave $[a = 1,82043047 \cdot 10^{-12} \text{ m}] \cdot [1,813342 \cdot 10^{-3} / \text{s}] = 3,3010625 \cdot 10^{-15} \text{ C}$ From equations Charge and Voltage is the Self-Growing Property of frequency f_n in Material-Point, therefore and for Hydrogen-cave is equal to $\rightarrow \bar{q} \cdot \Phi$, Because Gravitational Force is equal to $\rightarrow$ the Geometric-Resultant of light-velocity c , acting on Electron-Unit-Charge $\bar{q} \leftarrow$ or, $G = c \sqrt{2} \bar{q}$, then Electron-Charge is, $\bar{q} = \frac{G}{c \sqrt{2}} = \frac{6,680561 \cdot 10^{-11}}{1,41429 \cdot [2,9979346 \cdot 10^8]} = 1,58 \cdot 10^{-19} \text{ Coulomb}$, the known Coulomb's charge Quantity, For $\sigma_1 = 0$, the Pure Shear state, then $\sigma_{\text{EQUAL}} = \tau_{12} \cdot \sqrt{3}$ and $G = c \sqrt{3} \bar{q}$ and $\bar{q} = \frac{G}{c \sqrt{3}} = 1,29 \cdot 10^{-19} \text{ Coulomb}$ which is the Safety-Factor-Range of G action on Charge q .

From g_L, k_L Universal constants the Newton's Gravitational constant Force is, $G \equiv g \cdot k_E \equiv g \cdot [g_L k_L] \equiv [\frac{T^2_P}{a^3}] \cdot [g_L k_L] \equiv 9,808238 \cdot 6,8116 \cdot 10^{-12} \equiv 6,68056 \cdot 10^{-11} \frac{\text{m}^3}{\text{Ns}^2}$. The in depth Position of electrons allows to the Work Produced in Prior Phase-Areas as Golden Ratio Pattern, to be Stored in the Next. Energy = motion / $T \equiv (\frac{v}{2\pi r}) \cdot [\sigma + \sigma \Phi] = \bar{v} \cdot [\frac{\sigma}{2\pi r} + \frac{\sigma \Phi}{2\pi r}] \equiv \bar{v} \cdot [\bar{f}_n] + \mathbf{f}_n \equiv$ Moving - Storage $\rightarrow [\bar{v} \cdot \bar{f}_n] \leftarrow$ + Moving-Frequency $\rightarrow [\bar{v} \cdot \mathbf{f}_n] \leftarrow \equiv$ Material-Point i.e.

The Energy Produced in Photon-Cave is consisted of Two-moving-Storages, that travel as Wave $[\bar{v} \cdot \mathbf{f}_n] \rightarrow [\bar{v} \cdot \bar{f}_n] \rightarrow [\bar{v} = \bar{c} = \lambda \frac{f}{\Phi}] \rightarrow [S \equiv \text{EM-R} \equiv f_{1=N}, f_2, f_3, f_D, f_n = w^2]$, and as Particle $\rightarrow [f_1 = (E^2 + H^2) = n \frac{(1+\sqrt{5})\sigma}{2\pi r} = \frac{nB}{\pi^2 r^4}] \rightarrow \{W \equiv \text{EM-R} \equiv [\epsilon E^2 + \mu B^2] = 2 \cdot \lambda c \cdot \sin(2\phi)\}$ and is The Duality of an Energy-Storage $S \equiv \{[\oplus \leftarrow \mathbf{r} \rightarrow \ominus]\} + \text{Motion } M. [87-89]$

5c: The Origination of Hydrogen Cave H [99]

From Kepler third law, the Energy-Closed-Space equation and Newton's Laws of motion Constant $k = v^2 \cdot r = (w \cdot r)^2 \cdot r = [\frac{2\pi}{T} r]^2 \cdot r = \frac{4\pi^2 r^2}{T^2} \cdot r = \frac{4\pi^2 r^3}{T^2} = 4\pi^2 \cdot \frac{r^3}{T^2} = 4\pi^2 \cdot r^3 \cdot f_p^2 \dots (k)$ Because (k) is constant, $r^3 \cdot f_p^2$, is also a Constant multiplication of cave, r , and the frequency f , and the Work $\equiv$ motion are conserved in cave, r , as the, n , frequencies $f_N = n \frac{(1+\sqrt{5})\sigma}{2\pi r} = \frac{nB}{\pi^2 r^4}$, and for a Damping-cave $\rightarrow r(t) = r(t + w) \leftarrow$ as Planck's scale is with min-Damping = 1 and Unit-Energy-Quantity

W_u , (the critical-energy-unit in min, r), is this Unit-Stress-Gravity g , as $k = E = \frac{T^2}{a^3} = g = \frac{1}{f^2 \cdot a^3}$, i.e. $\rightarrow$ Stress $\bar{g}$, 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 the Hydrogen-Atom, where $gf^2 \equiv$ the Energy-Part embodied with stress $\bar{g}$, and the cave a^3 , is the Space-Part, in 3-DOF Space as $\rightarrow T^2 = g a^3 = 9,808238.[2,1145016.10^{-11}]^3 = 9,2728158.10^{-32}$ s, and from Period $T = 3,04513.10^{-16}$ s, the frequency $f = 3,2839982.10^{15}$ / s. From equation $E = h f = 6.62607.10^{-34} \cdot 3,2839982.10^{15} = 2,175999.10^{-18}$ J / $(1,6022.10^{-19}) = 13,59999$ eV Above Quantized Energy of 13,6 eV, corresponds to the Hydrogen-Atom-Cave. i.e. The Kepler's Planets second law for Areas $\rightarrow T^2 = g a^3 \leftarrow$ Is the meter $\equiv$ Monad

The Quantum, of Energy in Hydrogen cave. Above equal constant is $g a^3 f^2 = 1$ and relates the Energy $\equiv f^2$ and the Space $\equiv a^3$ through the Neutral-Space g .

It was shown that in Conservative Systems of a Central-Force, the Total energy E is conserved and at Periapsis, energy $E = \frac{G.Mm}{2a}$ and $e = \sqrt{1 + 2EL^2/G^2M^2m^3}$ and for $e = 0$ then $\rightarrow E = -\frac{G^2M^2m^3}{2L^2}$, i.e. Conserved Energy is always Negative.

Hydrogen cave constant is $k = E = \frac{T^2}{a^3} = g = [\frac{4\pi^2}{GM}]$ therefore $GM = \frac{4\pi^2a}{g}$ and from Newton Total-energy $E = -\frac{GMm}{2a}$, Rotational-Momentum $L = \sqrt{(1 - e^2) \cdot GMm^2 \cdot a}$

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

i.e. Equation $L^2 = -2a^2 \cdot E$, denotes that Angular - Momentum L , in Orbit - Rims is always Negative and equal to, $L = -a\sqrt{2 \cdot aE}$.

So, Hydrogen-Atom, is the minimum-Energy-cave In Planck's-Length, occupying the minimum Negative-Energy in Rims $\equiv$ Caves, the Space, where Quantum-Energy-Rims are the Plane Traces-Conductors in where can roll the $\ominus$ charged Electrons.

In Hydrogen-cave, the Resonance Frequency of an Electron $\ominus$, and a Proton $\oplus$, happens from the Stationary Unit-Cave of a System of Kepler second Planetary-law as equation, $4\pi^2 m f_o^2 = k$, and from constant law of Areas $1 = k \cdot f_o^2 \cdot a^3$. Their common Constant-Energy k , is $\rightarrow k = 4\pi^2 m f_p^2 = \frac{1}{f_p^2 a^3}$ or, $f_p^4 = \frac{1}{4\pi^2 m a^3}$ and $f_p = \sqrt[4]{\frac{1}{4\pi^2 m a^3}}$.

A loop in Planck's length $2a = L_p = \pi \cdot 1,616199.10^{-35}$ m with frequency $f = \frac{c}{\lambda}$, where then issues $f_p^4 = \frac{1}{4\pi^2 m a^3} = [\frac{c}{\lambda}]^4 = [\frac{1}{\lambda}]^4 \cdot \{c^4 = \frac{1}{[4\pi a^3] m \pi a}\}$, and for the Unit Intensity $I = \frac{\text{Energy}}{\text{Area}} = \frac{E = hf}{A = 4\pi a^3} = \frac{1KW}{A} = \frac{1}{[4\pi a^3]} = \frac{1}{\lambda^4} \{mc^4 \cdot \pi a\} =$ The Energy-Intension as $\frac{1}{\lambda^4} \{1\} \cdot 80,760865.10^{32} \cdot (3,14) \cdot 0,8080995.10^{-35} = 0,5865 \cdot \{\frac{1}{\lambda^4}\}$, $\rightarrow I = 0,5865 \cdot \{\frac{1}{\lambda^4}\} \leftarrow$ which is the Rayleigh Scattering, i.e. The Quanta of Energy, Passing through a Unit-Surface or Volume, which becomes from the Kepler's Second and third law Mechanism, is Inversely Proportional to the fourth Power of the wavelength λ . In Outer

Electromagnetic fields, frequency, w , is that of inner motion $\rightarrow w = \frac{2\pi}{T} = 2\pi \cdot f_N \equiv \left[\frac{1+\sqrt{5}}{2}\right] \frac{\sigma}{2\pi r} = \frac{\sigma \cdot \Phi}{r}$, which continuous to follow the Growth-Golden-Ratio-Pattern. Photon occupies such the Property of Material Point as the Growth-Pattern. With this way Photon's frequency $\rightarrow f_p = 1 / T_p$, Kicks-Start everything found on its-way. From the Resonance constant $k = \frac{1}{f_n^2 \cdot a^3} \rightarrow$ or $1 = k \cdot f_n^2 \cdot a^3 \leftarrow$ and from Kepler's laws and Newton's Lagrange laws for Orbits the cave-Semi-major-axis is $a = \sqrt[3]{T^2 / k} = \sqrt[3]{\frac{1}{g \cdot f^2}} = \sqrt[3]{\frac{4 \cdot \pi^2 \cdot r^2}{g \cdot \sigma^2 \cdot \Phi^2}} = \sqrt[3]{\frac{[4\pi^2] \cdot x \cdot r^2}{[g \cdot \Phi^2] \cdot x \cdot \sigma^2}}$, the Resonance frequency is $f_R = \frac{w_R}{2\pi} = \sqrt[2]{\frac{k-1}{g \cdot a^3}} = \sqrt[2]{\frac{\sigma}{g \cdot \Phi^2 \cdot a^3}} \equiv \sqrt{\frac{k}{md}} \text{ eV} \dots\dots(a)$

i.e. It is the Resonance-frequency f_R , in Photons loop, and which is the Energy-Space Quanta, following the Growth-Golden Ratio-Pattern, which travels in all Cosmos.

1. It was shown that when two Photons strike each other, $\vec{c} = \vec{c}$, or reflect on a wall, then $c = 0$ and so their fundamental frequency $f_1 = n \cdot \left[\frac{\bar{v}}{2r}\right] \times \left[\frac{1}{4}\right] = n \cdot \left[\frac{\bar{v}}{8r}\right]$ which for $n = \left[\frac{8 \cdot \pi r c}{v \cdot \lambda}\right]$ increases to $\frac{\lambda}{c}$, therefore for $n = N \cdot \left[\frac{8 \cdot \pi r c}{v \cdot \lambda}\right] = N \cdot \left[\frac{c}{\lambda}\right]$, and for $N \rightarrow \infty$ then $f_1 = E / h = \infty$..(b)
In Dual Photon $\bar{v} \left[\frac{\sigma \Phi}{2\pi r} + \frac{\sigma}{2\pi r}\right] \equiv \bar{v} \cdot \left[\bar{f}_n\right] + f_n$, Colours are Still-Sub-Units of Storage $\left[\bar{v} \cdot \bar{f}_n\right]$ and exist as the Frequencies, Violet, Blue, Green, which Stabilize with their Complementary colors Yellow, Orange, Red, of wavelength $d = \lambda \rightarrow \lambda_{\min} \approx \lambda_{\max} = 3.10^{-7} \text{ m} \approx 3 \cdot \sqrt{3} \cdot 10^{-7} \text{ m}$.
2. The Quanta of Energy Intension, Passing through a Unit-Surface or Volume is Inversely Proportional to the fourth Power of the wavelength λ and Intension is $I = 0,5865 \cdot \left\{\frac{1}{\lambda^4}\right\}$, meaning that, When $f_{BE} = E / h = \infty$ then the Energy-Intension Increases and the wavelength λ Decreases and for $f_{BE} = 0$ then $\lambda = 0$. This is what happens in Black-Holes where $d = \lambda = 0$, and in where $E = f_{BE} = \infty$. Hydrogen-Energy $E = h \cdot f_p = [6,6262 \cdot 10^{-34} \text{ J} \cdot \text{s}] \cdot [3,28393 \cdot 10^{15} / \text{s}] = 2,176 \cdot 10^{-18} \text{ J}$ and in eV $\rightarrow [2,176 \cdot 10^{-18}] / [1,6 \cdot 10^{-19}] = 13,6 \text{ eV}$,

Above Quantity of Energy consist the Hydrogen minimum Energy-Rim, becoming from equation $a = \sqrt[3]{T^2 / g} = \sqrt[3]{\frac{[3,04513 \cdot 10^{-16}]^2}{9,80769411}} = 2,1145016 \cdot 10^{-11} \text{ m}$, for the Unit energy cave.

6c: The Conservation of Energy in Catalyze and The Sun-Light

1. IN Geometry-Mechanism $\left\{ \begin{matrix} -A & :: \cup \\ +Z \uparrow & \left[\oplus \frac{\ddot{\cdot}}{2} + \ominus \frac{\ddot{\cdot}}{2} \right] D \end{matrix} \right\}$ of Conductors $\overline{ZA}, \overline{ZD}$, carries motion $\bar{E}$ from Common-Point Z of Square $|ZA \times ZD|$ of Plane Z,A,D from Z-Position to the 2-Half-Area Equilibrium-Squares on ZD Diameter $= \times \left[\oplus \frac{\ddot{\cdot}}{2} + \ominus \frac{\ddot{\cdot}}{2} \right] P$, at the Perpendicular-Position $\overline{ZA} \perp \overline{ZD}$, $\rightarrow$ i.e. The Two-Perpendicular Vectors, $ZA \perp CP$ Slide on (O,OA) circle and through the Three Poles, Z,A,D, carry the Stress σ , of Square $ZA \times ZD'$, to Two Equal and Opposite Stress-Squares $|ZOAD|$, $|ZOPD']$ of Halve Area -Stress Conservation, where the Neutral-Points $D \equiv P$, $+$ $\equiv \left[\oplus \frac{\ddot{\cdot}}{2} \right]$ and, $-$ $\equiv \left[\ominus \frac{\ddot{\cdot}}{2} \right]$, are the Still Halves at, $\pm = 0$, Positions. It is the < Markos 2-Vectors 3-Poles Mechanism > [100]

- IN Vibrating-Mechanism, masses carry motion as, Eigenvectors, at the equilibrium Positions, which are the Eigenvectors, at the Still-Positions. The Orthogonal Property of Normal-Modes for Eigenvalues and Eigenvectors Moulds is the Process of Equilibrium, and to the 2-Half-Area Still-Positions as Fig-44 [66] $\rightarrow [Z = \oplus \rightarrow \ominus = D] \equiv \begin{matrix} \mathbf{A} - & \vdots & \cup \\ \{ \uparrow \mathbf{Z} + & \left[\oplus \frac{\ddot{\cdot}}{2} + \ominus \frac{\ddot{\cdot}}{2} \right] \mathbf{D} \} \equiv \{ \pm [\mathbb{X}] \frac{-\oplus/2}{+\ominus/2} + \downarrow \leftrightarrow \uparrow \} \leftarrow \end{matrix}$
- IN Chemistry-Mechanism, NATURE occupies as first, The Compound Glucose-Oxide Activity $\text{H}_2\text{O}_2 \equiv \text{O}_4 \text{H}_2^2 = \text{O}_4^4 \mathbb{X} \text{H}_2^2 = \text{O}_3^1 \text{H}_0^2 = \text{ES} \frac{3\vec{\text{E}}}{3\vec{\text{M}}} \rightarrow, \text{T} \frac{6=4+2}{6=4+2}, \text{X. Inn} \frac{3 \rightarrow \vec{\text{E}}=1+2=6/2}{3 \rightarrow \vec{\text{M}}=1+2=6/2}$, which conserves Atoms-activities and Out $\frac{\text{Halve } 6=3\vec{\text{E}} \rightarrow 3+0 \rightarrow +\text{Electric} - \text{Vectors}}{\text{Halve } 6=3\vec{\text{M}} \leftarrow 3+0 \rightarrow -\text{Magnetic} - \text{Vectors}}$ existing Energy Still as Halves Energies at $\rightarrow (+)$ Positions $\text{O}_3^1 \text{H}_0^2 = \mathbb{X} = \left[\oplus \frac{\ddot{\cdot}}{2} + \ominus \frac{\ddot{\cdot}}{2} \right], \text{O}_1^3 \text{H}_2^0$, to $(-)$ Positions $\leftarrow$. Conservation of Energy as Two-Still-Halves is for $\text{C}_6 \text{H}_{13} \text{N}_1 \text{O}_3 \equiv \text{C}_{18}^1 \mathbb{X} \text{N}_2^3 \mathbb{X} \text{O}_3^6 \text{H}_0^{13} = \text{ST} \frac{23=\frac{46}{2}}{23=\frac{46}{2}}$, and Generally to all Compounds that Still at Halve or less from Electric Magnetic Vectors. Half-Energy (HE) = $\text{T}/2 \rightarrow \vec{\text{E}} \rightleftharpoons = 23. [e^+ = 0,3090169] = 7,1073887 \text{ eV}$. The Incorporated Energy (IE) = $\text{ES} \rightarrow \vec{\text{E}} \rightleftharpoons = 23. [e^+ = 0,3090169] = 7,10738 \text{ eV} = 675, 2019 \text{ kJ/mol}$. Total Energy (TE) = $\text{T} \rightarrow \vec{\text{E}} \rightleftharpoons = 46. [e^+ = 0,3090169] = 14,214777 \text{ eV}$
- IN Hydrogen Bracket Hook: [70] Gravity is the only Force which is continuously acting during Rotation and Precessing of Electron in Hydrogen cave. The Produced work is $W = P \cdot ds$, and since the Force P is constant then this work is stored in a Second Orbit $\equiv \text{HBH}$, in order to carry the motion.

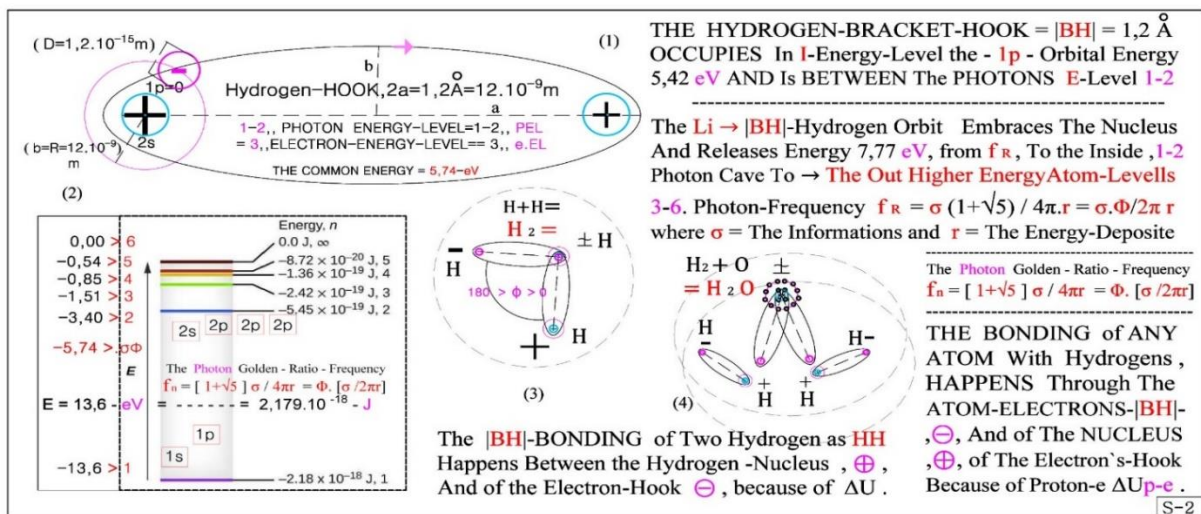


Figure 9: The $\pm$ Energy in Hydrogen and Atoms, with $\text{H} + \text{H} = \text{H}_1^1 + \text{H}_1^1 = \text{H}_1^{1-1} \text{H}_{1-1}^1 = \text{H}_1^0 + \text{H}_0^1 = \text{H}_2$ and Water $\text{H}_2\text{O} = \text{O}_1 \text{H}_2 = \text{O}_2^2 \text{H}_2^2 = \text{T} \frac{4}{4} = \text{O}_2^{2-2} \text{H}_{2-2}^2 = \text{O}_2^0 \text{H}_0^2 = \text{ES} \frac{2=\text{T}/2}{2=\text{T}/2}$, which Still at Halve

D: THE ORIGATION OF ANTI - GRAVITY - STRESS - g

1d: The Nature of Gravity g

- The light velocity c is constant. Since c is constant then is analyzed to, (c_x, c_y) in any two directions x, y where $x \perp y$ and y to be the gravity direction on where gravity is acting.

In figure (10) are seen the 4-Point Positions at where Velocity Phase changes and the Work done in each Phase of Photon's inner motion. The 4-Phases correspond to the Wavelength, λ , as $\lambda / 4$. in distance with $90^\circ = \frac{\pi}{2}$ to be the change of Phase. This means that the Produced Work in the Prior Phase-Area is as the Golden - Ratio Pattern which is Stored in the Next and Perpendicular Phase-Area. Light velocity, $\bar{c}$, changes Phase every 90° and the created Work $W = c_y \times [\text{Quarter circle 1-O-4}]$ is Symmetrically Stored from $0^\circ \rightarrow 90^\circ$ alternately $+, -, -, +$, in $[\text{Quarter circle 1-O-4}]$ in the $[\text{Quarter circle 4-O-2}]$ into $[\text{Quarter circle 2-O-3}]$ into $[\text{Quarter circle 3-O-1}]$ from Momentum $\equiv \text{Spin} \equiv \bar{B} \equiv r \times m \times v = [\frac{\pi \cdot r^2}{4}] \cdot \bar{c} \times \bar{r}$ where $\pm [\frac{\pi \cdot r^2}{4}] =$ The Quarter circle. The Quarter circle, $+, +$, consist the $+$ Spin $\equiv \bar{B}$ which is the Gravity Force, and the Quarter circle, $-, -$, consist the $-$ Spin $\equiv \bar{B}$ which is the Gravity Force from Total, $+, -, -, +$, When $r \rightarrow 0$ Or when $\bar{c}$ doesn't act on the Quarter circle then happens Black-Hole. In [108] is determined the when Newton's Gravitational Force $\bar{G}$, Stops Acting thrusting, on The Light velocity Vector $\bar{c}$, and happen the Black-Holes.

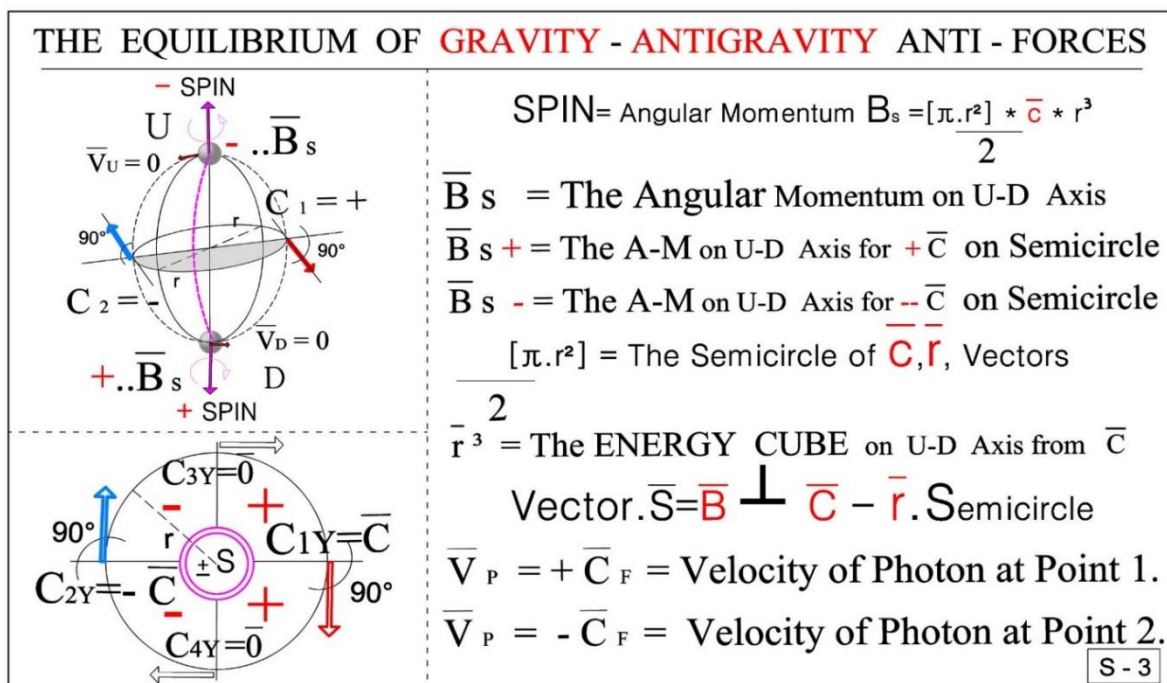


Figure 10: The Stability of $\pm$ SPIN as an Electromagnetic Wave of Two frequencies 0, c.

- b. The Dual Property of the Simultaneously existing Spin as Electric and as Magnetic Field in wavelengths, λ_x, λ_y , as Effective Range, is thrusts through the Light velocity $\bar{c}$, and finally is from the Newton's Gravitational Force $\bar{G}$. In Planck's length $r_p = 1,616255 \cdot 10^{-35}$ m the created Work of $\bar{c}$, from 1-4 Position is stored in the $[1-O-4]$ Quarter-circle surface and at Phase-4 where $c = 0$ is then stored in the $[4-O-2]$ Quarter circle surface. At Phase-2 where $\bar{c} = -\bar{c}$ motion is stored in the $[2-O-3]$ Quarter circle surface, and At Phase-3 where $\bar{c} = 0$ motion is stored in the $[3-O-1]$ Quarter circle surface, i.e. is alternately repeated the $+\frac{\pi \cdot r^2}{4} =$ The $+$ Quarter circle $[1-O-4]$, and the $-\frac{\pi \cdot r^2}{4} =$ The

- Quarter circle [4-0-2] both in the same Plane-surface [1-4-2-3] of motion. The Surface [1 - 4 - 2 - 3] is $\perp$ on the SPIN Axis $\rightarrow$ U - D. From $f_n = \frac{\sigma}{2\pi r} \Phi$ and $\bar{c} = \bar{w}.r = 2\pi f_n.r = 2\pi r.f_n = \sigma \Phi$, are frequencies, 0, c, relation. At $c = 0$ exist minima or maxima where is the change of two Energy-Semicircles.
- c. The Origination of Spin in cave H. From Orbit vibration $f_n = \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{\sigma}{2\pi r} \Phi$ and from relation $g.a^3.f_n^2 = 1$, $f_n^2 = \frac{\sigma^2}{4\pi^2 r^2} \Phi^2 = \frac{1}{g.a^3}$ then $g.a^3.\Phi^2 = \frac{4\pi^2 a^2}{\sigma^2}$, or 1). $a = \frac{1}{g} \left[\frac{2\pi}{\sigma \Phi} \right]^2$, and from Work $W = 2E = B w = J.w^2$, or $2E = 2\pi.f$ and $\bar{B}f = \frac{E}{\pi}$ then 2). The Energy in Planck-scale-cave $2E = \bar{B}f_n = \left[\frac{(1+\sqrt{5})\sigma}{4\pi r} \right].\bar{B} = \left[\frac{\sigma}{2\pi r} \right].\bar{B} \Phi$, or $E = \left[\Phi \frac{\sigma}{4\pi r} \right].\bar{B}$ i.e. The Energy in Planck-cave-Particles is Dependent on their Spin only, and for Electron $r = a_e \rightarrow E = \left[\Phi \frac{\sigma}{4\pi r} \right].\bar{B} = 1,6180339 \left[\frac{1}{4\pi.1,6840307.10^{-17}} \right] \times 2,845976.10^{-17} = \frac{21,76.10^{-19}}{1,6.10^{19}} = 13,6 \text{ eV}$, which is the min-Voltage in Hydrogen cave.
- d. The Angular Momentum in cave $\bar{c} - r$, In cave, r , The Energy-Vector $\bar{r}$ is Positive for $\overrightarrow{O3}$, $\overrightarrow{O1}$, $\overrightarrow{O4}$, Directions while, The Energy-Vector $\bar{r}$ is Negative for $\overrightarrow{O3}$, $\overrightarrow{O2}$, $\overrightarrow{O4}$, Directions. Since Total-Energy $L = B w = \frac{J.w}{2} w = \frac{J.w^2}{2}$ then $2L = J.w^2$, then Angular Momentum relation $\bar{B} = r.mv = r \left[\frac{\pi.r^4}{2} \right]. 2\pi f r = \pi^2.r^6.f$ and $B = J w$ i.e. Angular Momentum $\bar{B} = r m v = \frac{J.w}{2} = \left[\frac{\pi.r^4}{4} \right] \frac{c}{r} = \left[\frac{\pi.r^3}{4} \right].\bar{c} = \left[\frac{\pi.r^2}{4} \right].\bar{c} \times \bar{r} \dots (a)$ For $\bar{r} = \pm \bar{r}$, then $+\bar{B} = + \text{Gravity} - \text{Spin} = + \left[\frac{\pi.r^2}{4} \right].\bar{c} \times \bar{r}$, IS The $+$ Gravity Force - $\bar{B} = - \text{Gravity} - \text{Spin} = - \left[\frac{\pi.r^2}{4} \right].\bar{c} \times \bar{r}$, IS The $-$ Antigravity Force From Momentum relation $\bar{B} = m r v = m r^2 w = m r^2 (2\pi f) = \frac{J.w}{2} = \left[\frac{\pi.r^4}{2} \right].[2\pi f]$ then Spin $S \equiv$ Angular-Momentum $\bar{B} \equiv \bar{S} = \frac{J.w}{2} = \frac{\pi.r^4}{4} [2\pi f] = \pi^2.r^4.[f] = \frac{\pi.r^3\Phi.\sigma}{2} \equiv \frac{[1+\sqrt{5}].\sigma.\pi.r^3}{4} = \frac{\pi r^3 \sigma \Phi}{2} \dots (b)$ For $\bar{r} = \pm \bar{r}$, then $+\bar{S} = + \text{Gravity} - \text{Spin} = + \frac{\pi r^3 \sigma \Phi}{2}$, IS The Gravity Spin - $\bar{S} = - \text{Gravity} - \text{Spin} = - \frac{\pi r^3 \sigma \Phi}{2}$, IS The Antigravity Spin From Spin-Momentum relation $S = \bar{B} = \frac{E}{w} = \frac{E}{2\pi f} = \frac{Er}{\sigma \Phi} = \frac{rG}{\sigma \Phi}$, and $\bar{B}^2 = \frac{J^2 \sigma^2}{r^2} \Phi^2$, so $\rightarrow [\bar{B}]^2 = \left[\frac{\Phi \sigma}{r} \right]^2 \leftarrow$ while from Gravity-force $\mathbf{F}_G \equiv \mathbf{m}_G g = g.\nabla[\sigma c].r = \mathbf{m}_G \frac{c^2}{r} = Jw^2.\mathbf{g}_G = \frac{v^2}{r} \left[\frac{\pi.r^4}{2} \right] \frac{v^2}{r^2} = \frac{\pi r v^4}{2}$, and Gravity-Acceleration $\pm \mathbf{g}_G = \left[\frac{\pi r v^4}{2} \right].e^3$, Geometry Growth $\left[\frac{\pi r v^4}{2} \right] = \left[\frac{3,1415926([\sqrt{5}+1].\sqrt[4]{2}.10^{-35}).(2,99793458.10^8)^4}{2} \right].e^3 = 6,044981.10^{-35}.80,773378.10^{32}.20,085536 = \mathbf{g}_G = \pm 9,8076925$. i.e. Gravity $+\mathbf{g}_G = +9,807692 = \frac{\partial r \bar{c}}{\partial t} = +\bar{S}$, and Antigravity $= -\mathbf{g}_G = -9,807692 = \frac{\partial r \bar{c}}{\partial t} = -\bar{S}$ are the Two Opposite Forces as Spin and for the Stability of the Spin - $\bar{S}$, Equilibrium. For $c = 0$ exist minima or maxima and thus SPIN is equal to the Negative Gradient of the Potential Energy in the two Interchange Energy Semi circles.

2d: The Stability of Equilibrium

In the Conservative System, of cave $\bar{c} - r$, the Total Energy $\mathbf{E}_T$ remains constant and the Total-Energy is $\mathbf{E}_T = \mathbf{E}_K + \mathbf{E}_U = \frac{1}{2} [\dot{\mathbf{x}}]^2 + U(\mathbf{x}) = \text{constant} \dots (1)$ where $\mathbf{E}_K$ = The Kinetic Energy and $\mathbf{E}_U$ = The Potential Energy. For $y = \dot{\mathbf{x}}$ then, $y = \dot{\mathbf{x}} = \pm \sqrt{2 \cdot [\mathbf{E} - \mathbf{U}(\mathbf{x})]} \dots (2)$

The differential equation of motion in cave $\bar{c} - r$, for Conservative Systems is $\ddot{\mathbf{x}} = f(\mathbf{x})$ and Because $\ddot{\mathbf{x}} = \dot{\mathbf{x}} (d\dot{\mathbf{x}}/d\mathbf{x})$ then $\dot{\mathbf{x}} \cdot d\dot{\mathbf{x}} = f(\mathbf{x})d\mathbf{x} = 0 \dots (3)$ By Integrating then $\frac{\dot{\mathbf{x}}^2}{2} - \int_0^{\mathbf{x}} f(\mathbf{x})d\mathbf{x} = \mathbf{E}$, and by comparison to Priors then $\rightarrow U(\mathbf{x}) = - \int_0^{\mathbf{x}} f(\mathbf{x})d\mathbf{x}$ or $f(\mathbf{x}) = - \frac{dU}{d\mathbf{x}} = \ddot{\mathbf{x}} \dots (4)$ i.e. For the Conservative System, of cave $\bar{c} - r$, the force $= \bar{\mathbf{B}} = r \cdot m \cdot \bar{c} = \frac{J \cdot w^2}{2} = [\frac{\pi \cdot r^2}{2}] \cdot \bar{c}^2$ is Equal to the Negative Gradient of the Potential Energy Into 2-Energy Semi-circles.

For $y = \dot{\mathbf{x}}$ then (3) becomes $\frac{dy}{dx} = \frac{f(\mathbf{x})}{y} = \Phi(\mathbf{x}, y)$, and the Singular Points correspond to $f(\mathbf{x}) = 0$, and $y = \dot{\mathbf{x}} = 0$ and hence are the Equilibrium Points. For every Point x, y in the Phase-Plane for which $\Phi(\mathbf{x}, y)$ is not indeterminate exists a unique slope of the trajectory.

When the velocity vector is at Points 1,2 then $y = 0$ and $f(\mathbf{x}, y) = C \neq 0$ then the Slope of the trajectory is infinite and angle $\varphi = 90^\circ$. Since motion in cave $\bar{c} - r$, is a single-DOF oscillator, then motion equation is $\ddot{\mathbf{x}} + w^2 \mathbf{x} = 0$. Equation indicates that at the Equilibrium Singular Points, 3, 4, the Slope of the Potential Energy curve $U(\mathbf{x})$ must be zero, meaning minima or maxima, and which is the $\pm$ change of direction for the Four Energy- Quarter circles [1-0-4], [4-0-2], [2-0-3], [3-0-1] in (c_x, c_y) where $\bar{c}_y = \bar{c}$ = Spin Direction,

Conclusions:

1. From A-Momentum $\bar{\mathbf{B}} = r \cdot m \cdot \bar{c} = \frac{J \cdot w^2}{2} = \frac{1}{2} [\dot{\mathbf{x}}]^2 + U(\mathbf{x}) = \frac{1}{2} [y]^2 + \frac{1}{2} k x^2 = \text{constant}$, then Spin $S \equiv \bar{\mathbf{B}} = \frac{1}{2} [y]^2 + \frac{1}{2} k x^2 = [y]^2 + w^2 x^2 = C = \text{Constant}$, or $\rightarrow y^2 + w^2 x^2 = C \leftarrow \dots (a)$ Equation (a) is a series of Ellipses determined by C , and in case of $y/w = y$ then reduce to circles $y^2 + x^2 = C$, in $\bar{c} - r$ Plane and Perpendicular to S as, $[\bar{c} - r] \perp \bar{S}$.
2. In the Conservative System of cave $\bar{c} - r$, where $\bar{c}$ = Light-Velocity = $2.9985163 \cdot 10^8$ m/s, r = Planck's -Length = $\sqrt[4]{2} \cdot 10^{-35}$ m, motion in cave is an single-DOF Oscillator as equation $\ddot{\mathbf{x}} + w^2 \mathbf{x} = 0$. Equation of motion is a circle on where exist the 2-Singular Points 3, 4, meaning minima or maxima, where issues $\frac{dy}{dx} = \frac{f(\mathbf{x})}{y} = \Phi(\mathbf{x}, y)$, and are in the Mode-Shapes at the Points of Equilibrium. At Singular Points 3, 4, Velocity $\bar{c}_y = \bar{c} = 0$ and Spin $\bar{S}$ = Gravity = 0, and since $\frac{dy}{dx} < 0$, then Spin $\bar{S}$ changes Direction becoming - $\bar{S}$ = Antigravity = 0, meaning that at Singular Points Gravity & Antigravity are Zero.
3. At Point 1, Velocity $\bar{c}_y = + \bar{c}$ because of $\bar{c}_y$, $+\downarrow$ direction, and corresponds the Spin $\bar{S}$ = Gravity = $\bar{\mathbf{B}} = r \cdot m \cdot \bar{c}$ which is Constant and equal to Work = $\bar{c}_y \times [\text{Quarter circle 1-0-4}]$ At Point 2, Velocity $\bar{c}_y = - \bar{c}$ because of $\bar{c}_y$, $-\uparrow$ direction and corresponds the Spin $\bar{S}$ = Gravity = $\bar{\mathbf{B}} = r \cdot m \cdot \bar{c}$ which is Constant and equal to Work = $\bar{c}_y \times [\text{Quarter circle 2-0-3}]$ where the [Semicircle 4-1-3] = $+\bar{\mathbf{B}} \equiv$ The Gravity, and [Semicircle 4-2-3] $\equiv -\bar{\mathbf{B}}$ = The Antigravity. The produced Work from the eternal Rotation is store in the Semicircles as, (+) Total Work = [Semicircle 4-1-3] = $+\bar{S}$ and (-) Total Work = [Semicircle 4-2-3] = $-\bar{S}$

4. From Newton's law of Universal Gravitation $m \cdot r \cdot \bar{w}^2 = G \frac{m \cdot M}{r^2}$, and when $m = 1$, issues $\bar{w}^2 = \frac{G \cdot M}{r^3}$, and $B = J w$, therefore angular velocity $\bar{w} = \pm \sqrt{\frac{GM}{r^3}} = \pm \sqrt{\frac{G \cdot \pi \cdot r^4}{2 \cdot r^3}} = \pm \sqrt{\frac{\pi \cdot G r}{2}}$. This Angular - momentum is identical with Spin, which is trapped in caves's loops which are in Phase with each other. The amplitude of Oscillation varies from Zero at Nodes to maxima at Antinodes. Since Frequency $\equiv f_n = (\frac{n\sigma}{8r^2}) \cdot \bar{B}$, so Energy-caves are Stationary Wave-Fringes
5. The Total-Energy, E_T , in Caves, [70]
- In any Moving System $E_T = E_R + E_K = \frac{\pi c^2}{8} r^3 + \frac{1}{2} m \cdot v^2 = 3,535 \cdot 10^{16} \cdot r^3 + \frac{1}{2} m \cdot v^2$,
 - Light-Velocity $\bar{c}$ of Photons becomes from the Action of G on Plancks Length $L_P = r_P = 1,6162 \cdot 10^{-35}$ m cave r , and when cave $r = \frac{h}{c \cdot Z_c} \neq L_P$ originates Hydrogen-cave. It is shown later that when the G action Area - Resistance $\equiv$ Gravitational-Impedance $Z_{G-I} = 6,344907 \cdot 10^{-35}$ Kg differs for any reason then Black-Holes happen.
 - Euler's Rotating Rigid Body. The D-Work is $W = 2L = \bar{B} \cdot \bar{w} = J \cdot w^2 \equiv h \cdot f_n$, and for m mass $W = h f_m$, Angular-Momentum $\bar{B} = \frac{2L}{\bar{w}} = \frac{2L}{2\pi f} = [\frac{2L}{2\pi}] \cdot [\frac{1}{f}] = \frac{\text{Constant}}{2\pi} [\frac{1}{f_m}] = \text{SPIN}$
 - In Central-motion, Kepler constant $k = 4\pi^2 \cdot r^3 \cdot f_P^2$, or $1 = [\frac{4\pi^2}{k}] r^3 \cdot f_P^2$, $1 = c \cdot r^3 \cdot f_P^2$ where for $\rightarrow r \rightarrow 0$ then $f_P \rightarrow \infty \leftarrow$, a case of a Black-Hole in any Central motion.
 - The Vibrations in Orbit-Systems are as $\rightarrow W = 4\pi^2 \cdot [\frac{r^3}{T^2}] \cdot \bar{n} = 4\pi^2 \cdot r^3 \cdot f_P^2 \cdot \bar{n} \leftarrow$
 - In [PNS] Neutral Space, Dumping force is $F_d = C \cdot \dot{r} = \pm C_o \cdot w \cdot [\sqrt{A^2 - r^2}]$ and $F_d^2 / [C_o \cdot w \cdot A]^2 + r^2 / A^2 = 1$, i.e. Energy $\equiv$ motion is mapped as an Ellipse with axis, F_d , x , and Energy Dissipated Per - Cycle, the Area enclosed by ellipse.
 - The Energy in [PNS], is either as momentum (mv) or as Rotational Momentum ($\Lambda = r \cdot mv$). Velocity $\dot{x}$, in form $\dot{x} = w A \cos.(wt - \theta) = \pm w A \cdot [\sqrt{1 - \sin^2(wt - \theta)}] = \pm w \cdot [\sqrt{A^2 - x^2}]$ where momentum relation $\bar{B} = m r v = m r^2 w = m r^2 (2\pi f) = \frac{I \cdot w}{2} = [\frac{\pi r^4}{4}] \cdot [2\pi f] = \frac{\pi^2 r^4 f}{2}$, and Mass of Elementary-Particles is $m = \frac{\pi^2 r^4 f}{2w \cdot r^2} = \frac{\pi^2 r^3}{2v} f = \frac{\pi^1 r^2}{4}$, or The repeated Quarter circle $[\frac{\pi \cdot r^2}{4}]$ Surface of the $\pm$ Spin Dual Property In Planck's length and area, $A_{QC} = [\frac{\pi \cdot r^2}{4}] = \frac{3,1415926 \cdot (\sqrt[4]{2} \cdot 10^{-35})^2}{4} = 1,1107206 \cdot 10^{-70} \text{ m}^2$. Since issues the monad of mass to be $[\frac{eV}{c^2}] = 1,782662 \cdot 10^{-36} \text{ Kg}$, then Energy Dissipated Per - $A_{QC} = E_{QC} = (1,1107206 \cdot 10^{-70} \text{ m}^2 / 1,782662 \cdot 10^{-36} = 6,230715 \cdot 10^{-35} \text{ Kg}$, Or from the G action Area - Resistance $\equiv$ Gravitational-Impedance Z_{IQC} , exists $Z_{IQC} = \sqrt{2} c^3 A_{QC} / G$, and $m_{PNS} \equiv Z_{IQC} = \sqrt{2} \cdot c^3 A_{QC} / G = \frac{1,4143 \cdot (27 \cdot 10^{24}) \cdot 1,1107206 \cdot 10^{-70}}{6,680056 \cdot 10^{-11}} = 6,344907 \cdot 10^{-35} \text{ Kg}$. The result agree with Prior because in [PNS] Dipole of Space exists the Impedance Z_{IQC} , which Doesn't exist in [MFMF] Space. [22-26]
 - In [MFMF] Space, Work = motion = Energy is zero as $W = \int_B^A P \cdot ds = 0$, and this because $ds = \vec{v} = 0$ and Time is not existing and $\vec{v} = 0$ as relation, $s = \vec{v} \cdot T$. Each Unit $\overrightarrow{AB} = ds > 0$ 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 Universe and that of Spaces

exists because of this Static Inner Impulse, on the contrary should be one Point only or, Primary Point A = Black Hole $\rightarrow ds = 0$ and $P = \infty$. Since Impulse is ∞ then may be $\rightarrow$ Vacuum, Momentum or Potential or Induced Potential and it is a Type of Effect, to Push the nature $\rightarrow$ (Impulse $\equiv$ Motion $\equiv$ Energy) $\leftarrow$

3d: The Nature of Antigravity - g

From Mechanics in case that, in an Axisymmetric Rotating Rigid-Body, with a constant Angular-Velocity, w , the moment of Inertia, $\mathbf{J}_x = \mathbf{J}_y$, is equal about the two of the three Principal axis, and then issues,

1. The Angular - velocity - vector, $\bar{\mathbf{w}}$, describes the Ellipsoid of Angular Velocity and its Nib describes a Cone of which Plane-Base is Fixed Simultaneously,
2. The Angular-Momentum, $\bar{\mathbf{B}}$, describes the Ellipsoid of Angular-Momentum and its Nib describes a Cone also of which Plane-Base is also Fixed.
3. The Nib of Angular - velocity - vector, $\bar{\mathbf{w}}$, describes on the Tangential-Plane of the Angular-Momentum-Ellipsoid $\rightarrow$ The Polhode $\leftarrow$ while,
4. The Nib of Angular-Momentum, $\bar{\mathbf{B}}$, describes on the Stationary Tangential-Plane of the Angular-Velocity-Ellipsoid $\rightarrow$ The Herpolhode $\leftarrow$.
5. The Fixed - Tangential-Planes on, $\bar{\mathbf{w}}$, and, $\bar{\mathbf{B}}$, Nib are alternately Perpendicular to, $\bar{\mathbf{B}}$, and, $\bar{\mathbf{w}}$, common Central Axes of Rotation. From Newton's law of Universal Gravitation $[\bar{\mathbf{w}}]^2 \cdot r^3 = GM = 6,68 \cdot 10^{-11} \times 2,17643 \cdot 10^{-8} = 14,538726 \cdot 10^{-19}$ and from Planck's cave $r_P = 1,6162 \cdot 10^{-35}$ m in case of Energy Superflow the still happens in Sub-Spaces which is PNS-Space as $\mathbf{f}_{\text{PNS}} = \sqrt[3]{\frac{14,538726 \cdot 10^{-19}}{4 \cdot \pi^2 \cdot [1,6162 \cdot 10^{-35}]^3}} = 8,934121 \cdot 10^{44}$ Hz and $\sqrt[2]{f_{\text{PNS}}} = \sqrt[2]{8,93412 \cdot 10^{44}} = 2,9897 \cdot 10^{22}$ which is γ -Ray frequency in Black-Holes
6. The Kinetic Rotational - Energy of monad, which is the Work in monad, is the Scalar quantity, L , The Vector Angular Momentum quantity is, $\bar{\mathbf{B}}$, and the Vector Angular-Velocity quantity is, $\bar{\mathbf{w}}$, which Three monads are related as $\bar{\mathbf{B}} \cdot \bar{\mathbf{w}} = 2L = J \cdot w^2$ where J = The moment of inertia around the axis of rotation = $\uparrow \downarrow$
7. All above happen in, Material-Point, where the Positive $\oplus$ constituent, The $+\bar{\mathbf{c}}$, is Eternally self - rolling on the Negative $\ominus$ constituent, The $-\bar{\mathbf{c}}$, with Angular-Velocity w , in Infinite Spherical traces, either at Great-circles $[+ \text{ or } -]$, or Small-circles, $[+]$ where is the Clockwise Left direction, and $[-]$ where is Anti-Clockwise Right direction or any other close Spherical-curve, and Applying all laws of Mechanics into this Energy Chaos, is thus created the $\rightarrow$ First-Discrete - Energy-monad, the Material Point $\leftarrow$ i.e. The Angular Momentum $\bar{\mathbf{B}}$, is the Quantum of Physics and is, for all the Energy - Space-Universe. The Energy E dissipated per cycle is equal to the Work $W_d \rightarrow E = h f = \frac{h(1+\sqrt{5})}{4\pi} \cdot [\frac{\sigma}{r}] = 8 \cdot k \zeta(\pi r^2)$, and is Stored in monad, which is a Stationary Wave with and -in, n , loops as $\mathbf{W}_n = [\frac{4\pi r^2}{3}] \cdot \mathbf{f}_n = [\frac{4\pi r^2}{3}] \cdot n \mathbf{f}_1 = n \frac{(1+\sqrt{5})\sigma r}{3} = n \frac{[\sigma \Phi \cdot r]}{1,5}$.
8. Geometry has as Monad, The discrete continuity $\overline{\mathbf{AB}}$ -length becoming from the Zero Point $\equiv 0$, and Mechanics-Physics the Recent-Acquisition of the Material - Geometry, where Zero-Point, $0 = \emptyset = \{\oplus + \ominus\}$ = The Material-Point = The Quantum of Space, as, The Positive Space and The Negative Anti-Space. [58] In Fig-10, The Light velocity vector $\bar{\mathbf{c}} = 2,9979 \cdot 10^8$ m/s Rotates In the Planck's length Perimeter $r_P = 1,616255 \cdot 10^{-35}$ m, and is thrust through The Newton's - Gravitational Force $\bar{\mathbf{G}}$, During Rotation is created Work

which is stored in the circle Surface as Angular - Momentum $\bar{\mathbf{B}} = r m v = \frac{J.w}{2} = \left[\frac{\pi.r^4}{4}\right] \frac{c}{r} = \left[\frac{\pi.r^3}{4}\right].\bar{c} = \left[\frac{\pi.r^2}{4}\right].\bar{c} \times \bar{r}$, in Semi circle $\{+[4-1-3]\}$, and Semi circle $\{-[4-2-3]\}$, for the Stability of Equilibrium. i.e.

Gravity + $\bar{g} \equiv$ The Vector of Angular-Momentum $\bar{\mathbf{B}} \equiv + \text{Spin} \equiv \downarrow \cup \equiv$ The Work stored in the $[4-1-3]$ Semi circle of the, $\bar{r} - \bar{c}$ Vectors circle-Surface, Produced from the Gravitational-Force, G , as ACTING into the -Planck- Cave, AND on the light Velocity Vector of, $+\downarrow \bar{c}$ Direction.

Antigravity - $\bar{g} \equiv$ The Vector of Angular -Momentum $\bar{\mathbf{B}} \equiv - \text{Spin} \equiv \uparrow \cup \equiv$ The Work stored in the complementary $[4-2-3]$ Semi circle of the, $\bar{r} - \bar{c}$ Vectors circle-Surface which is Produced from the Gravitational-Force, G , as ACTING into the - Planck- Cave, AND on the light Velocity Vector of The, $-\uparrow \bar{c}$ Direction.

4d: The Conservation of Energy in $\rightarrow$ Velocity $\bar{c}$ Vector and Gravity $\bar{g}$ Caves $\leftarrow$

Since Gravity- $\bar{g}$ is the Energy $\equiv$ The Angular-Momentum $\{\bar{\mathbf{B}} = r m v\}$ in Planck's length r_p , and it is a Stationary-Wave or an Electromagnetic Wave-Signal which transmits Informations. Then follows the Waves-Frequency-Signal-Spectrum. The Gravitational Constant G is the Active force on light velocity $\bar{c}$ and consequently on $\bar{g}$ also.

From Waves theory $\rightarrow$ Position $x = A \sin wt$ and Acceleration $\ddot{x} = A w^2 \leftarrow$ where the Signal-Spectrum is consisted of the Amplitude A_c and of the Angular frequency $\bar{w}$, from where all other Properties follow. Since $\ddot{x}$ is the acceleration Force of Position x , then for Planck's length issues $\ddot{x} = G = A^2_G . w^2$, or $\bar{w} = \sqrt{G/A^2} = \sqrt{6,68.10^{-11}/[2,6262.10^{-35}]^2}$ and Gravity-frequency $\rightarrow \bar{w} = 0,5057.10^{30}$ H and Gravity-Wave-frequency $f_{GW} = 8,05.10^{28}$ H $\leftarrow$ THE GRAVITATIONAL FORCE ACTION : $[[G]] \rightarrow \{[\bar{c}] \pm E_n\} \equiv \bar{g} \equiv E_n + \{[G] \pm [\bar{c}]\} \rightarrow E_R = E_G + E_{\bar{c}} \leftarrow$ where, $[[G]] =$ [Gravitational Constant $G \equiv$ The Signalling. (W_c) $\rightarrow$ The Carrier - Wave $[[\bar{c}]] =$ Any Action of $[G - ON - \bar{v}] \equiv$ Any Signalling. ($\bar{v}$) Modulating Velocity - Wave $[[\bar{g}]] =$ The New Modulated $[G \leftrightarrow \bar{v}]$ Signal $\equiv f \frac{\bar{v} m + wc}{2} + f \frac{\bar{v} m - wc}{2} \equiv$ [MAS] COMPOUND = The Demodulated [MAS] $\equiv f \frac{w + 2wc}{2} + f \frac{w - 2wc}{2} \equiv$ [DMAS]. $\bar{v} m$ as $[G =$ The CARRIER $]\rightarrow [\bar{c} =$ The MODULATOR $]\rightarrow [G + \bar{c} =$ The MODULATED $]$ and $[G + \bar{c}] + \bar{g} \leftrightarrow [DM = \text{ANTIDOTES}] =$ The DEMODULATION $]i.e.$ The Communications-Frequencies In Planck's Cave, are the Wave Resonances which consist the Master-Keys of these wave - caves.

5d: The Conservation of Energy in CAVES, in Atoms and Compounds. [106]

THE ATOMS -ACTIONS: $[[A]] \rightarrow \{[B] \pm E_n\} \equiv C \equiv E_n + \{[A] \pm [B]\} \rightarrow E_n = E_C + E_A \leftarrow$ where

$[[A]] =$ [Atom OR Compound] $\equiv$ The Signalling. (W_c) $\rightarrow$ The Carrier - Wave

$[[B]] =$ Any[A-OR-C] $\equiv$ Any Signalling. (w) Wave = The Modulating - Wave

$[[C]] =$ The New Modulated Wave $[A]$ Signal $\equiv f \frac{w + wc}{2} + f \frac{w - wc}{2} \equiv$ [MAS] ANTIDOTE = The Demodulated [MAS] $\equiv f \frac{w + 2wc}{2} + f \frac{w - 2wc}{2} \equiv$ [DMAS]

The Atoms Action (1)... $[A] \rightarrow \{[B] \pm E_n\} \equiv [C] \equiv \pm E_n + \{[B] + [A]\}$, $[A] \equiv [C] + \{X_N\}$ $[A] =$ The Initial, $[C] =$ The Final, $[X_N] = \{[B] \pm [E_n]\} \equiv$ The Antidote.

The Atoms Action (2) $[A] \rightarrow [\pm E_N] \equiv [C] \equiv \equiv \pm E_n + [A]$,,, $[A] \equiv [C] + [E_N][A]$ = The Initial, $[C]$ = The Final, $[E_N] \equiv$ The Antidote, The Circular-Signal-Action is as, $I \rightarrow F = [I + F]$ and $[I + F] \leftrightarrow [DM] \equiv$ Antidote, or $[I = \text{CARRIER}] \rightarrow [F = \text{MODULATOR}] \rightarrow [I + F = \text{MODULATED}] \rightarrow [I + F] + M \leftrightarrow [DM = \text{ANTIDOTES}] = \text{THE DEMODULATION}$. The Communications -Frequencies in Atoms - Caves, are their Wave Resonances which consist the Master-Keys of all the Wave - caves. The Carrier Wave IN-PNS-Space is the Angular Momentum due to the Centripetal Force & from The Nature of Universe $\rightarrow \text{SPACES \& ENERGY} \equiv \text{MOTION} \leftarrow$ where IN Caves {The meter of Space-Positions-Changes} $\equiv$ The Period & {The meter of Energy-State - Changes $\equiv$ Angular-momentum} $\equiv$ The Spin

5d1: The Gravitational Waves

- a) Spaces of Atmosphere Particles are consisted of Hydrogen Atom with One Nucleus of Spin $\{+\frac{1}{2}\}$ and one Electron in Energy- Orbit of Spin $\{-\frac{1}{2}\}$. It is a Nucleus-Orbit-Magnet $\equiv \oplus \text{ Proton} \leftrightarrow \ominus \text{ Electron}$ which ORIGINATES the Constant-Resonance-frequency f_R between them becoming from an Eternal changeable motion of 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 an Resonance - frequency f_R , IN ORBIT-RIM N -O. This Orbit-Rim which is [The, m_N, m_e , Current-loop], continually increase its Energy and so Produces a Signal in the Hydrogen-Atom. This Signal is related to the cave r as $g = 4\pi^2 \cdot r^3 \cdot f_R^2$ and $f_R = \sqrt{\frac{g}{4\pi^2 \cdot r^3}}$ i.e. Gravity g, acting On The Varying-Velocity $\dot{x}$ of the Orbiting-Electron creates Work which is Conserved as Electron-Magnetic-Field, magnetic moment, $\bar{\mu}$, in a time T, and is a Resonance-frequency f_R . When velocity $\dot{x} = 0$, and since the Produced work becomes from the Potential ΔU , then $W = U(x)$, i.e. the Signal is the Increasing Potential - Energy in loop. The $[m_N, m_e, \text{Current-loop}]$ consists the Energy-Bond between the Atoms and is the Communication-tool, The Resonance Signal, in all Universe. In case of An-External-Magnetic - Field, Electron-Spin is swigging around the Magnetic Vector and this Motion, the Nutation, is transferred to the Nucleus. The Produced-Work as Frequency $f_N = \frac{sQ}{2\pi \cdot J_3 w} \equiv f_R = 2,8398447 \cdot 10^{10} \text{ s}^{-1}$.
- b) In the Spaces of Gravitational-Fields, Gravity-Antigravity, issues the Dual-Angular Momentum $\bar{B}$ where, $\bar{B} = r \cdot m \cdot v = \frac{J \cdot w}{2} = \left[\frac{\pi \cdot r^4}{4}\right] \frac{c}{r} = \left[\frac{\pi \cdot r^3}{4}\right] \cdot \bar{c} = \left[\frac{\pi \cdot r^2}{4}\right] \cdot \bar{c} \times \bar{r}$, From Orbit Vibration issues $f_n = \frac{1}{g \cdot r^3}$, and from Kepler second law $g \cdot r^3 \cdot f_n^2 = 1$ therefore $r = \frac{1}{g} \left[\frac{2\pi}{\sigma \Phi}\right]^2$. Also from Work $W = 2E = B \cdot w = J \cdot w^2$, or $2E = 2\pi \cdot f$ and relation $E = \left[\Phi \frac{\sigma}{4\pi r}\right] \cdot \bar{B}$, then $E = \left[\frac{g \Phi^2}{16\pi^3}\right] \cdot \bar{B}$ or $E = \left[\frac{\Phi^2}{16\pi^3}\right] \cdot g \cdot \bar{B} \equiv$ Produced motion from gravity g and A-Momentum $\bar{B}$ where $k_E =$ The Earth Local-coefficient between the two constants, g, G, i.e.

From $G = E = h \cdot f_n = g \cdot k_E$ Actions is Generated, by the Relative motion of Gravity & Antigravity Produced from Momentum $\bar{B}$ which is a Pointy - Radiating Wave or Not, A Gravitational Field $\bar{E}$ of Strength = $g \cdot k_E$. The Pointy-Spinning Material-Points which become from Stationary-Material-Points either are Photons or Electrons & are Fluctuating in the Potential Plane $\perp \bar{B}$,

The Herpolhode-Plane Produces Transient-Displacements becoming from the 2-Potentials, $\Delta U = U_2 - U_1$, and which are The Gravitational - Waves.

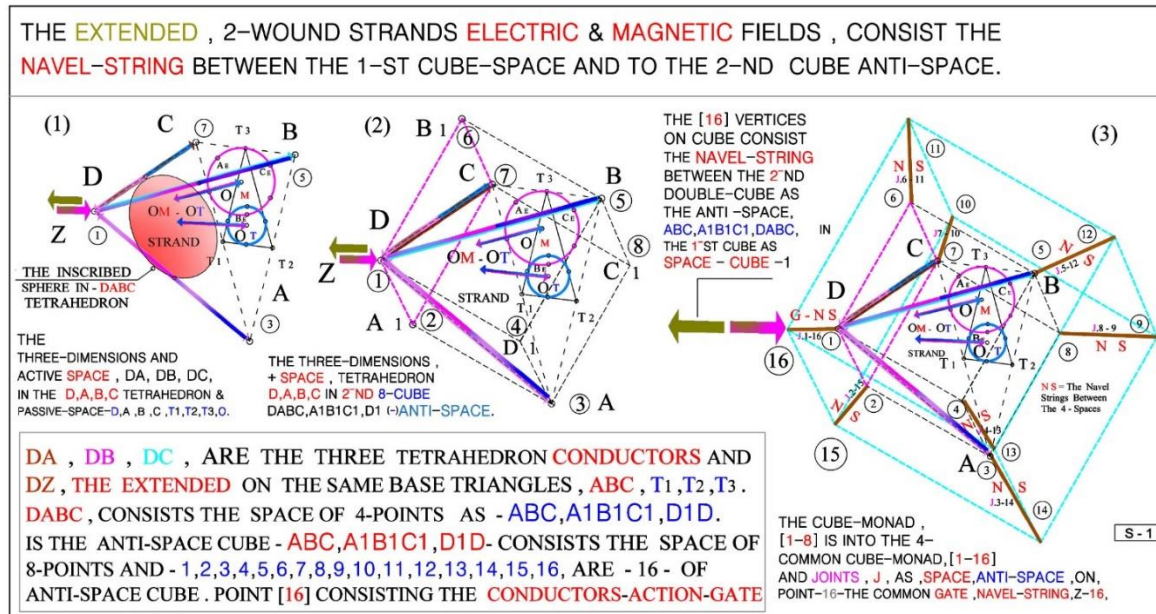


Figure 11: The Electric-Magnetic Field of 3-Conductors Results on 2-Anti-Parallel-Strands.

The Electric and Magnetic Field of 4-Conductors ZA, ZB, ZC, ZD, On 2-Anti Parallel Strands. The Electromagnetic-Resultant-Vectors ZD Acts on $\vec{O_M \uparrow \downarrow Z}$, $\vec{O_T \uparrow \downarrow Z}$ Base ABC with Complementary Vectors, at O_M , O_T centers of Rotation ZDO_M , ZDO_T . Because of Different Torsion on ZD axis, $ZDO_M \neq ZO_M$, The Vectors-Foot transport to O_T of ZDO_T New axis. DNA follows this way of balancing Sustaining on RNA-structure The Stability of $\rightarrow \{\oplus 4\text{-Space [D A B C]}\}$ Regular-Tetrahedron, IN $\{\ominus 8\text{-Anti- Space Cube [DA}_1\text{B D}_1, \text{C C}_1\text{AB}_1]\}$, and The $\rightarrow \{\oplus 8\text{-Space [DA}_1\text{BD}_1, \text{CC}_1\text{AB}_1]\}$ - Cube INTO The $\{\ominus 16\text{-Anti-Space [1,2,3,4,5, 6, 7, 8-9,10,11, 12, 13,14,15,16]}\}$ Sphere Cube Vertices. Point [16 $\equiv \rightarrow [Z]$] consists a Navel-String Gate in $\{Z-(\Delta D, ABC), \Delta [T_1 T_2 T_3]\}$ Stationary Bases In Dual Photon $\bar{\nu} [\frac{\sigma \Phi}{2\pi r} + \frac{\sigma}{2\pi r}] \equiv \bar{\nu} \cdot [\bar{f}_n] + f_n$, The Colours are the Still-Sub-Units, or the Mode Shapes for Eigenvectors of the Photon - Particle Storage $\rightarrow [\bar{\nu} \cdot \bar{f}_n] \leftarrow$ and which exists as Frequencies, Violet, Blue, Green, with their Complementary Yellow, Orange, Red $\leftarrow [93]$.

E: THE ORIGINATION OF THE BLACK HOLES

TO PROVE $\Rightarrow$

- 1e1.: The DUAL-Momentum as, Real $\equiv$ Existing-Universe, Imaginary $\equiv$ Black-Holes
- 1e2.: The DUAL-Refractive of Energy in, Space angle φ , and, Imaginary Energy velocity $\bar{c} \equiv \bar{\nu}_1, \bar{\nu}_2$, The Space $\equiv$ Matter, The Anti-Space $\equiv$ Anti-Matter.
- 1e3.: The DUAL-Photon as, Space $\equiv$ Particle and, $E \equiv \{E \Rightarrow M\}$ - Wave, $[s + \bar{\nu} \nabla i]$
- 1e4.: The DUAL-Spin as, Space $\equiv$ Gravity, Anti-Space $\equiv$ Anti-Gravity.

The Elements and the Proofs

A vector of Amplitude A, Rotating at constant Angular Speed w , can be represented as a Complex quantity z in the Argand diagram as $z = A.e^{iwt} = A \cos wt + i. A \sin wt = x + i. y$ of Wave-form where $x \equiv$ The Real and $y \equiv$ The Imaginary Part of the Wave $\equiv (s + \bar{v} \nabla i)$.

The simplest form of Periodic motion is the Harmonic followed by the Waves as, $x = A \sin 2\pi t/T = A \sin 2\pi f. t = A \sin wt$,(e1) where $A =$ The Amplitude of oscillation measured from the equilibrium Position of Any-Two Opposite $\equiv [\ominus \cup \oplus] \equiv [\oplus \rightarrow A \leftarrow \ominus]$, T is the Period. The motion is repeated when time $t = T = \frac{1}{f}$, where $f =$ the frequency and because the motion repeats itself in 2π radians then issues the relationship $w = 2\pi f$. Using the dot notation for the derivative then obtained, Displacement $x = A \sin wt$, Velocity $\dot{x} = w A \sin(wt + \frac{\pi}{2})$, Acceleration $\ddot{x} = -w^2 A \sin(wt)$ and revealed the relation $\ddot{x} = -w^2 x$, or, $\rightarrow \ddot{x} + w^2. x = 0 \leftarrow$ which is the equation of motion with Acceleration Proportional to the Displacement as states Newton's second law of motion.

The Complex conjugate of a Complex Space, $\bar{z}$, is that has the same elements and additive structure as, z , Rotating in the Negative direction, $-w$, and satisfies the relation, $\bar{z} = A.e^{-iwt}$ (e2). The Real component x is expressible in terms of as z , and $\bar{z}$, as $x = \frac{1}{2} \{z + \bar{z}\} = A \cos wt = \text{Re. } A.e^{iwt}$,(e3). where Re stands for the Real Part of the quantity z . Operations between two Complex quantities $z_1 = A_1.e^{i\varphi_1}$, $z_2 = A_2.e^{i\varphi_2}$, are for Multiplication $\rightarrow z_1. z_2 = A_1. A_2.e^{i[\varphi_1 + \varphi_2]}$, Division $\rightarrow \frac{z_1}{z_2} = \frac{A_1}{A_2}. e^{i[\varphi_1 - \varphi_2]}$, Powers $\rightarrow z^n = A^n. e^{in\varphi}$ and the Inverse $z^{-n} = 1/A^n. e^{-in\varphi} = i\varphi/n$.

Some General Maths Proofs

1ea: WHY-Motion in PNS is Continuous in Time and Work $\equiv$ Energy is Quantized in Caves?

Motion is the Action for changing location or Position in a finite or infinite time. Energy is the Work, the motion in One-Two and Three directions which is executed in time. In order that this Motion is conserved as Displacement, then must be Quantized in a Finite Space, differently is annihilated. In Mechanics, the only-possible motions in a Finite-Space is 1-The Periodic excitation, the Oscillatory which is repetitive and fluctuates between two locations and 2-The Revolving motion, The Rotation. It was shown in PNS Space x, y, z time t is not existing and this because of the constant velocity c , where $\dot{x} = 0$, $\dot{y} = 0$, $\dot{z} = 0$, and where Curl of the velocity vector field is the on axis Torque $\nabla \bar{v} = \frac{\partial \bar{v}}{\partial x} \dot{x} + \frac{\partial \bar{v}}{\partial y} \dot{y} + \frac{\partial \bar{v}}{\partial z} \dot{z}$. Motion is determined as the displacement of a Point A to another Position B. Displacement denotes Work Production i.e. a force P , acting on Point A, and transferring force at B. Because Points are nothing exists in Nature the Material Point being a cave $AB \equiv [\oplus \leftrightarrow \ominus]$ where $AB \equiv [\ominus \cup \cup \oplus]$ with $\oplus$ charge and $\ominus$ charge as Action of Opposites. Since Action of force P is axial and it stills between Points A, B, then eternal exists in time. This eternal motion in cave AB is called {Quantization of motion $\equiv$ Energy in cave AB }. Motion in a finite-Space as this in cave $AB \equiv r$ can be realized only when Action of Point A moves to Point B or, by the Revolving Action of Point A round Point B. The cave $AB \equiv r$ is equal to the diameter of the two $|\oplus r \ominus|$ constituents,

1eb: The DUAL-Refraction of Energy in any Space with Angle θ :

We consider as Space the Region of a Homogenous Space which is divided by a Plane in where Exist Two different Potential - Energies as U_1 and U_2 . As motion $\equiv$ Energy we consider a Particle with a Kinetic Energy $T = m v_1^2 / 2$, either having mass m or Not having any mass, and with the Different velocities v_1, v_2 , at each region. The Particle passing from Region-1 makes the angle θ_1 to Normal-1 while passing from Region-2 makes the angle θ_2 to the Normal-2.

To show the How Total Energy behaves in the two Regions, The Work Produced in Potential Plane-Side U_1 is $W = T \cdot \sin \theta_1 \cdot \sin \theta_1 = T \cdot [\sin \theta_1]^2$ The Work Produced in Potential Plane-Side U_2 is $W = [T - \Delta U] \cdot \sin \theta_2 \cdot \sin \theta_2 = [T - \Delta U] \cdot [\sin \theta_2]^2$, where $\Delta U = U_2 - U_1$ is the lost Energy in Region-2. Dividing the two Energy relations then, $\frac{\sin \theta_1^2}{\sin \theta_2^2} = \frac{T - \Delta U}{T} = \frac{T + U_1 - U_2}{T} = 1 + \frac{U_1 - U_2}{T}$, where the

Roots Ratio $\frac{\sin \theta_1}{\sin \theta_2} = \sqrt{1 + \frac{U_1 - U_2}{T}}$. since $\frac{\sin \theta_1}{\sin \theta_2} = \frac{v_2}{v_1} = \frac{m \cdot v_2}{m \cdot v_1} = \frac{\text{Potential}_2}{\text{Potential}_1}$, i.e. The linear Momentum, where angles θ_1, θ_2 consist the Space and, mv_1, mv_2 , the Energy of Particle.

Conclusion-1, The Inner-Rotation of AB cave $\equiv$ Space = s , is Possible in the three dimensions $1\bar{i}, 1\bar{j}, 1\bar{k}$, and because exists the Centripetal force $F_c = mc^2 / r$, then from this Rotation is created an Angular Momentum vector $\bar{\mathbf{B}} = r m c$, where r = the cave AB, m = the Resistance to the motion, c = the light velocity. This means that PNS-Space is a set of 4 numbers meaning a Complex number of Real-Part the cave AB = s and Imaginary-Part $\bar{\mathbf{B}} = B1\bar{i}, B2\bar{j}, B3\bar{k} \equiv (s + \bar{v} \nabla i)$ representing the Quaternion where, The Space = s , and Energy = motion = The Imaginary Part $\equiv \bar{v} \nabla i$, for the 3-d Rotation and with respect to the one variable.

2e: The Planck's Length: [31]

The Binomial nature of Monad $\overline{AB}$. Fig-1- According to the Binomial theorem it is possible to expand on the Power, d , or $1/d \equiv d^{-1}$ of monad $AB = (s + \bar{v} \nabla i)d$ into a sum involving terms of the form as $(d k) \cdot (s)d - k \cdot (\bar{v} \nabla i) k$ (binomial formula) and each $(d k)$ is a specific Positive integer known as binomial coefficient. On Monad AB with Power $d = 1 \rightarrow \infty$ are created infinite Spaces and infinite Anti-Spaces (monads) On and In the same monad. i.e. Spaces, Anti-Spaces and Sub-Spaces On and In the same Monad are differing, on the binomial coefficient, the successive decrease of Powers on s and increase of Power on $(\bar{v} \nabla i)$ which are also the infinite monads in monads. Since Spaces and Sub-Spaces are of wave nature then infinite Spaces and infinite Anti-Spaces differ only in angular velocity $\bar{\omega}$, in velocity $\bar{v}$, and in wavelength, λ . [27], [29].

The Spaces - Sub-Spaces of monad $[AB]$ are, $[AB] = (s + \bar{v} \nabla i)d = (d0) \cdot (s)d \cdot (\bar{v} \nabla i) 0 + (d1) \cdot (s)d - 1 \cdot (\bar{v} \nabla i) 1 + \dots \dots (dk) \cdot (s)d - k \cdot (\bar{v} \nabla i) k + (dd-1) \cdot (s) 1 \cdot (\bar{v} \nabla i) w - 1 + (dd)$, and for Sub-Spaces $(s + \bar{v} \nabla i) 1/d = (d0) \cdot (s) 1/d \cdot (\bar{v} \nabla i) 0 + (1/d1) \cdot (s) 1/d - 1 \cdot (\bar{v} \nabla i) 1 + \dots \dots (1/dk) \cdot (s) 1/d - k \cdot (\bar{v} \nabla i) k + (1/d1/d-1) \cdot (s) 1 \cdot (\bar{v} \nabla i) 1/d - 1 + (dd)$

i.e. Spaces or Sub-Spaces of any monad AB, are Scalar or Imaginary or Both Parts. [14] From above monads $(s + \bar{v} \nabla i)^{1/d} = |z_0|^{-1/d} \cdot e^{i(\varphi + 2k\pi)/d}$, where $\cos \varphi = s / |z_0|$, and for the Rotated Energy case where $s = 0$, and also for, $\cos \varphi = 0$, then exists for angle $\varphi = \pi/2$, or, The Quaternion $(s + \bar{v} \nabla i)^{1/d}$ of dimension Power $e^{i(\frac{\pi}{2} + 2k\pi) \cdot 1} = e^{-i(\frac{5\pi}{2}) \cdot b} = e^{-i(\frac{\pi}{2} + 2k\pi) \cdot b} = e \cdot i \cdot (-5\pi/2) \cdot 10$ where the Spaces $L_p = e \cdot i \cdot (-5\pi/2) \cdot 10$, is the basic Geometrical interpretation of the < Planck - scale - meter > based on the two Geometry constants e, π , where $k = 1$, and base $b = 10$, from logarithm Properties with different bases on the same base e , as $ed = (b \log b(e))d = bd \cdot \log b(e)$ and $\sqrt[d]{e}$

$= e^{1/d} = e^{-d} = x_1 / d \cdot \log b$ (e) being monads in monad, and is therefore of Wave motion with the angular velocity $w = 4W_d / (\pi \cdot C_o \cdot \lambda^2)$, and this because is quantized in the finite-Space $\lambda = c / f$, i.e. $\rightarrow$ Space and Energy is quantized and measured $\leftarrow$ On the two Constant and Natural numbers, e , π , where for base the Natural logarithm, e , and exponent the decimal base, $b = 10$, exists Planck's Length $L_p = e^{-i(\frac{\pi}{2} + 2k\pi) \cdot b} = e^{i \cdot (-5\pi/2) \cdot 10} = e^{i \cdot (-5\pi/2) \cdot 10} = e^{-78,5398} = 8,906 \cdot 10^{-35} \text{ m}$ or For base $e = 2,71828$ and base $b = 10$ then $e^{-78,2879} = 1.10^{-34} \text{ m}$, For base $e = 2,71828$ and base $b = 10$ then $e^{-78,5398} = 1.10^{-34} = 8,906 \cdot 10^{-35} \text{ m}$, For base $e = 2,71828$ and base $b = 10$ then $e^{-80,5905} = 1.10^{-35} \text{ m}$

Since cave is a versor then Planck's Length $[8,906 \cdot 10^{-35}]$ is divided by $\pi \cdot \sqrt{3}$ and is $L_p = e^{i(\frac{\pi}{2} + 2k\pi) \cdot b} = e^{-i(5\frac{\pi}{2}) \cdot b} = e^{i(-5\frac{\pi}{2}) \cdot 10} = e^{-(78,5398)} = 8,906 \cdot 10^{-35} = \sqrt{3} \cdot \pi \cdot 1,616199 \cdot 10^{-35} \text{ m}$ which are the Energy - caves, and the Answer to the above question. [26]

Nature has Not any < meter > to measure Quantized Quantities (of Space and Energy) except these of Geometry constants, one of which is number, π , (Archimedes number π) so the quantization of Points (as λ) follows Geometry constant (π) and for Energy W_d , which is the quantized Energy of the Quantity dissipated Per cycle $= 2\pi$ [and this because monads as before follow sinusoidal oscillation on wavelength = monads as the d.th Power and the n.th Root of this monad where $d \cdot n = 1$ as above, On and In the same monad]and which energy is W_d as, $W_d = (mw) \lambda_p^2 / 4 = (2m\pi f) \cdot \lambda_p^2 / 4 = (m\pi \cdot \lambda_p^2 / 2) \cdot f = C \cdot f$ i.e.

From above monads $\rightarrow (s + \bar{v} \nabla i)^{1/d} = |z_o| - d \cdot e^{i(\varphi + 2k\pi)/d} \leftarrow$ where $\cos \varphi = s / |z_o|$, and for Rotated Energy case, where, $s = 0$, and also for $\cos \varphi = 0$, Exists $\rightarrow$ for angle $\varphi = \pi / 2$, The Quaternion $(s + \bar{v} \nabla i)^{1/d}$ as dimension Power $e^{-i(\frac{\pi}{2} + 2k\pi) \cdot 1} = e^{-i(\frac{5\pi}{2}) \cdot b} = e^{-i(\frac{\pi}{2} + 2k\pi) \cdot b} = e^{i \cdot (-5\pi/2) \cdot 10}$ and is as [26] $\leftarrow$ From Classical Mechanics [70]

3e: The Central Axial-Ellipsoid and $\oplus$ Constituent Rotating Through a Constant Point O

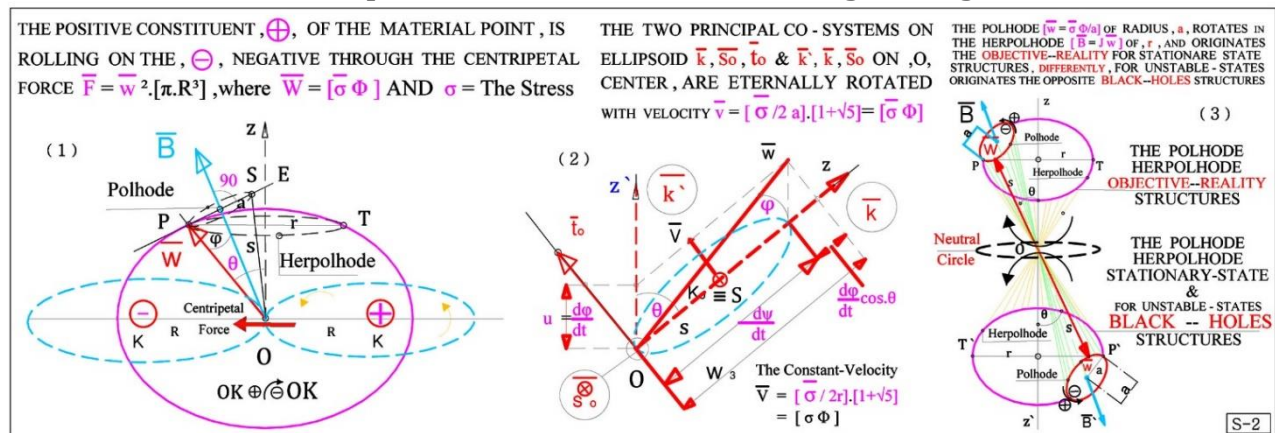


Figure 12: The 3-dimension motion of $[\ominus \cup \oplus]$ in PNS-Space is Angular Momentum $\bar{B}$.

In (1-2) Material Point KOK as {The two circles $\ominus \equiv O, [OK]$ and, $\oplus \equiv O, [OK]$ } where Space Point K (+) and Anti-Point K (-) is rotating through Point O, which is the center of Common circle and

form material angle $\varphi = \varphi_A \cdot t = \left(\frac{v_A}{\sqrt{c^2 - r^2}}\right) \cdot t$, CREATE the Cardioid Envelope curves generated by the above Vibrating -Velocity-Energy-Geometry-Segment, KOK on K, [OK], rolling circle. [79]

The rotation of Space Point K (+) and Anti-Point K (-) through Point O defines Angular momentum $\bar{\mathbf{B}}$, so the Position of Spaces, Point K (+) and Point K (-), and Momentum are simultaneously determined, which is a direct violation of the Uncertainty Principle.

Is shown also the Rotation with angular-velocity $\bar{\omega}$, 45° to the instantaneous material axis $OP \equiv [\oplus \leftrightarrow \ominus]$ of rotation where Point P is the, Nib, of Angular-velocity vector $\bar{\omega}$, and Sweeps-Out at OP slant height of the Central, POT-Cone, with $\bar{\omega} = \frac{v}{R} = 2\pi f$.

In (3) are shown Polhode circle PT, Herpolhode PT` circle in Plane E. Polhode-Cone-POT which is rolling on the Fixed- Herpolhode-Cone POS, with the constant Centripetal velocity $|\bar{v}| = \frac{\sigma}{2} [1 + \sqrt{5}] \equiv \sigma \cdot \Phi$, dependent on the Pressure, σ , of the two material constituents $[\oplus, \ominus]$. The Integrated Equations of motion become Not from Center of mass K_0 (Fig-2-) But from the center O. Since motion of $\oplus$ constituent becomes from Stress, σ , only, then the constant coordinate System is taken at O, with, z' , axis Perpendicular to the Unit-vector $\bar{\mathbf{k}}$, $[z' \perp \bar{\mathbf{k}}]$ which is on OK_0 axis, (is the x axis).

Conclusion 2

In PNS-Space, Momentum $\bar{\mathbf{B}}$ is created from the Eternal Rotation of the two Opposite constituents $[\oplus, \ominus]$ with the constant Centripetal velocity $|\bar{v}| \equiv \sigma \cdot \Phi$, where the Curl of the velocity vector field is with the ON-Axis Torque $\nabla \bar{v}$, where $\dot{x} = 0, \dot{y} = 0, \dot{z} = 0$. In PNS-Space, time exists only as Period T from the Rotating constituents $[\oplus, \ominus]$.

4e: The Vector-equation of Motion [70]P- 60,70

The vector equation of Rotational-axis-motion is defined by analyzing Angular momentum $\bar{\mathbf{w}}$ to the $\bar{\mathbf{k}}$ direction of Ellipsoid-Inertial-axis and another one Perpendicular to $\bar{\mathbf{k}}$, where then $\bar{\mathbf{w}} = \bar{w}_1 \bar{\mathbf{i}} + \bar{w}_2 \bar{\mathbf{j}} + \bar{w}_3 \bar{\mathbf{k}} = \{\bar{\mathbf{k}} [\bar{\mathbf{w}} \bar{\mathbf{k}}]\} + \bar{\mathbf{k}} \bar{\mathbf{w}}$ and since $[\bar{\mathbf{w}} \bar{\mathbf{k}}] = \frac{d\bar{\mathbf{k}}}{dt}$ then, $\bar{\mathbf{w}} = [\bar{\mathbf{k}} \frac{d\bar{\mathbf{k}}}{dt}] + \bar{\mathbf{k}} w_3$ (25a)

Analyzing Momentum-vector $\bar{\mathbf{B}}$ as above to the same $\bar{\mathbf{k}}$ direction then exists, $\bar{\mathbf{B}} = (\bar{w}_1 \bar{\mathbf{i}} + \bar{w}_2 \bar{\mathbf{j}}) \cdot \bar{\mathbf{j}}_1 + \bar{w}_3 \bar{\mathbf{j}}_3 = [\bar{\mathbf{k}} \frac{d\bar{\mathbf{k}}}{dt}] \cdot \bar{\mathbf{j}}_1 + \bar{w}_3 \cdot \bar{\mathbf{j}}_3 \dots \dots \dots$ (25b)

The Moment of external forces Q, to Point, O, is equal to $\rightarrow [\bar{\mathbf{s}} \bar{\mathbf{Q}}] = -s \cdot Q [\bar{\mathbf{k}} \bar{\mathbf{k}}']$ and Momentum becomes $\bar{\mathbf{j}}_1 \{\bar{\mathbf{k}} \frac{d^2 \bar{\mathbf{k}}}{dt^2}\} + \bar{\mathbf{j}}_3 w_3 \frac{d\bar{\mathbf{k}}}{dt} + s Q [\bar{\mathbf{k}} \bar{\mathbf{k}}'] = 0 \dots \dots$ (25)

where $s = OS$, the length of mass center from the rotation Point O, $Q =$ The weight of the Material Point, and the circular velocity w_3 was shown to be constant.

Equation (25) defines Unit-vector, $\bar{\mathbf{k}}$, of the Ellipsoid-rotating-axis, is related to time so, after the solution of equations (25a) and (25b) define the Angular velocity, $\bar{\omega}$, and the Angular - Momentum-vector $\bar{\mathbf{B}}$ respectively.

It was proved [page 62] that $\bar{B}$ vector is that what we call The Spin of Particles. Since the 3-d Rotation happens in one axis k with respect to the only-one variable then Momentum is a Quaternion of dimension Power $(s + \bar{v} \nabla i)^{1/d}$.

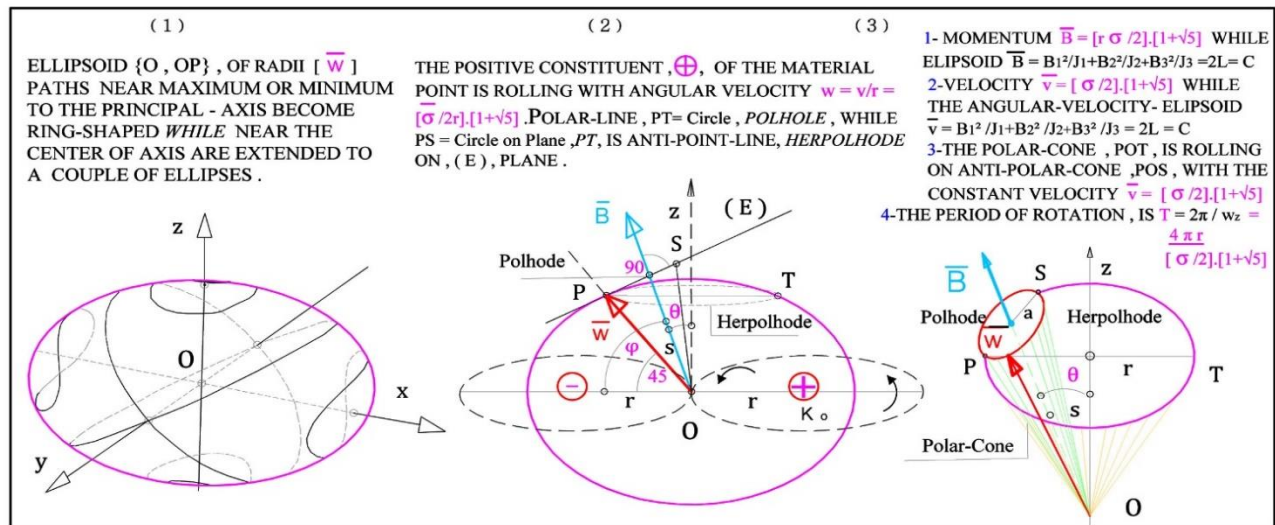


Figure 13: In (1) are shown Paths near maximum or minimum to the Principal axis z , from where become-ring shaped or Small-circles, while the near the center of axis extend to a couple of ellipses or Great circles. Rotating on small circles is created the $\pm \frac{1}{2}$ Spin $\equiv \bar{B}$

In (2) is shown the Rotation with angular-velocity $\bar{w}$, 45° to the instantaneous material axis $OP \equiv [\oplus \leftrightarrow \ominus]$ of rotation where Point P is the, Nib, of Angular-velocity vector $\bar{w}$, and Sweeps-Out at OP slant height of the Central, POT - Cone, with $\bar{w} = \frac{v}{R} = 2\pi f$.

In (3) are shown Polhode $\rightarrow$ The circle PS , Herpolhode $\rightarrow$ The circle PT in Plane E . The Polhode Cone POS which is rolling on the Fixed- Herpolhode-Cone POT , with the constant velocity $|\bar{v}| = \frac{\sigma}{2} [1 + \sqrt{5}] = \sigma \Phi$, depends on Pressure, σ , of the two material constituents $[\oplus, \ominus]$. The Integrated Equations of motion become Not from Center of mass K_o , But from center O . Since motion of $\oplus$ constituent becomes from Stress, σ , only, then constant coordinate System is taken at O , with $z' \perp \bar{k}$ which is the x axis.

5e: The Eternal Precession of the Material Point. Fig-12- 13

Torque, T , is the Twisting - Force that tends to cause rotation $\{T = Q.r \sin \psi$, where Q is The force and, ψ , the angle between radius, r , and force $Q\}$ and the Angular-momentum vector $L = J.w \equiv$ The Material - Point, which is a System that has an Inner - Rotation constrained, Due to the velocity vector, $\bar{v} = \frac{d\psi}{dt} = \bar{w}.r$ becoming from Stress, σ , and which is the Force-applied on lever - arm, r , in a Space, on where External Forces and Moments are Not existing. We call this Space Primary-Neutral-Space PNS . The inner forces of this System, are the two equilibrium Centripetal and Centrifugal Forces due to the Eternal, $\pm \sigma$, Stresses of Opposites. Introducing above in (25) and, divided by $\sin \vartheta$, and when $0 < \vartheta < \pi$, and, $\pi < \vartheta < 2\pi$, then becomes the relation to u , variant as, $\rightarrow J_1.u^2 \cos \vartheta - J_3.w_3.u + s.Q = 0 \dots (26) \leftarrow$

Equation (26) is the Necessary - Proposition, Precession, for the motion of ANY Material Point $[\ominus \cup \cup \oplus]$, $[\oplus \leftrightarrow \ominus]$, differently, In case that is Not holding then Precession near the axis of Ellipsoid is continuously existing.

Considering the Material-Point Rotating with a great speed $\frac{d\psi}{dt}$, around a fix Point O, and near the symmetrical axis of the Central Ellipsoid, and lying on this axis also, then because of the great velocity exists a great Angular velocity and therefore a Strong Rotational-Momentum, so that change is very small as, $d\bar{B} = \bar{M}dt = [s \bar{Q}]dt = -s Q [\bar{k} \bar{k}']dt$, and for a short of time it is very small to real Momentum, as $(|B| \Rightarrow |s Q|)$. The same also happens to Kinetic energy for a small displacement on $\ominus$, constituent. In figures.12 -13, $\oplus$ constituent executes different rings near maxima or minima. Around the fixed Vector of Momentum, $\bar{B}$, is moving the Angular-velocity-vector $\bar{w}$, while the Inertial-Ellipsoid is Rolling on the Poinot's constant Plane PS, following a Circular Polar curve and, the animated rolling on the fixed Central- Pole-Cone, and thus drawing the symmetrical axis, Oz, to Precession.

Because Vectors $\bar{B}$ and $\bar{w}$, are very near each other and both to $\bar{k}$ axis, Polar curves are very narrow rings as in figure to the Animated on the Ellipsoid of that of Angular-velocity while the Un-movable on Poinot's Plane and around Vector $\bar{B}$. During motion, Momentum, $\bar{B}$, is altered because of the different moment of Inertia due to the Area of the traced-curve and so is added, $-s Q [\bar{k} \bar{k}']dt$ perpendicularly to the $\bar{k}$ symmetrical axis and thus to the mean Position of Vectors, $\bar{B}$, and $\bar{k}$ axis.

The above happen because of the Equality of the Kinetic-Energy and of Rotating-Energy, as $L = (1/2) \cdot \Sigma m_i \cdot \bar{v}_i^2 = (1/2) \cdot [\Sigma m_i] \cdot \bar{v}_s^2 = (1/2) \cdot \Sigma m_i \cdot [\bar{w} \cdot \bar{r}_i]^2 = (1/2) \cdot (\Sigma m_i \cdot \bar{r}_i^2) \cdot \bar{w}^2 = \frac{1}{2} J_a w^2$, i.e. Rotational Kinetic Energy $L = \frac{1}{2} J_a w^2 = (1/2) \cdot [\Sigma m_i] \cdot \bar{v}_s^2 = L = \text{Kinetic Energy}$, and dependent on moment of Inertia J, which is related to the Area of the curve, so Rotational-Momentum- vector $\bar{B}$, is slowly rotated on Central axis with angular velocity, u, which is $\frac{d\bar{B}}{dt} = -s Q [\bar{k} \bar{k}']$.

Integrating (Angular velocity $u \equiv w_z$) becomes $\rightarrow \frac{s Q}{B} = \frac{s Q}{J_3 w} \leftarrow$ with the Period of rotation $T = \frac{2\pi}{u} = \frac{2\pi J_3 \cdot w}{s Q}$. Since also frequency $f = 1 / T$ then $\rightarrow f_{PNS} = \frac{s Q}{2\pi J_3 \cdot w} \leftarrow$ (26b) denoting. The frequency-monad of rotation in PNS -Space. For Total-Energy issues $2L = J_a w^2$. The Second degree Equation (26) gives real roots for velocity u, only for negative $\cos \vartheta$, i.e. The center of mass, S, is below the Rotational Point O. and If $\cos \vartheta > 0$, $\vartheta = 0 - \pi/2$, then $w_3^2 > = \frac{4 J_1 s Q \cdot \cos \vartheta}{J_s^2} \dots$ (27) and by solving (26) then, IN-PNS $\Rightarrow$ Angular-velocity $u = |\bar{w}| = \frac{d\varphi}{dt} = \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} \pm \sqrt{-\frac{s Q}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} \dots$ (27a).

Equation (27a) is of 2nd degree and has three solutions, 2 - Real, 1-Imaginary as e_a, e_b, e_c .

e_a .. In Material-Point where there are Not External forces then $Q = 0$ and equation becomes Angular-velocity $u = |\bar{w}| = \frac{d\varphi}{dt} = \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} \pm \sqrt{\left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} = \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} + \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} = \frac{J_3 \cdot w_3}{J_1 \cdot \cos \vartheta} \dots (e_a 1)$ and when $J_1 = J_3$ then $u = \frac{w_3}{\cos \vartheta} = w_3 \cdot \sec \vartheta$, meaning that the constancy of the velocity u , becomes from the Rotating Energy $\bar{B}$ only, as this constancy happens for light c , in cave r .

From figure this happens when figure— w_3 coincides with that of Angular velocity vector, $|\bar{w}|$, and from $\frac{d\psi}{dt}$, where then its direction coincides with the Ellipsoid-Symmetrical-axis, OS. The second term being in square is strengthening J_1 moment of inertia directing the axis to J_3 direction. This Material Point occupies large Moment of Inertia by rotating about the Ellipsoid Symmetrical-axis through constant Point O, on Ellipsoid-axis, of the truncated Cone, i.e. The Inner-Rotation of Material-Point, happens through the Algebraic and constant Angular-velocity-vector $|\bar{w}|$, {on the Ellipsoid-Symmetrical-axis} where the Surface of the Truncated-Polar-Cone is Rolling, sweeps out, On the Unmovable – Herpolhode Cone with a very large figure, The absolute value, of Angular velocity vector, $|\bar{w}|$.

Conclusion a:

Since Angular-velocity $u = |\bar{w}_z|$, a vector, and Rotates in one axis k with respect to the one variable only then Momentum is a Quaternion of dimension Power $(s + \bar{v} \nabla i)^1/d$. Since also $w = 2\pi f$, then frequency-monad in PNS -Space is created from Angular-velocity vector $|\bar{w}|$.

Since Herpolhode = a Quaternion-Monad, this Monad Produces the Existing Universe {Real-1}, AS Polhode $\rightarrow$ The circle PS, Herpolhode $\rightarrow$ The circle PT in Plane E, Polhode Cone $\rightarrow$ by rolling on the Fixed- Herpolhode-Cone POS, with constant velocity $|\bar{c}| = \sigma \Phi$. Space is The Eternally Planck's Length $L_p = e^{-i \cdot (\frac{\pi}{2} + 2k\pi) \cdot b} = e \cdot i \cdot (-5\pi/2) \cdot 10 = 8,906 \cdot 10^{-35} \text{ m}$.

e_b ..Algebraic-magnitude-figure w_3 is such that, the within square root is zero or near zero, and Angular-velocity $u = |\bar{w}_z| = \frac{d\varphi}{dt} = \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} = \pm 0 \dots\dots (e_b 2)$

The root is weakening J_1 moment of inertia directing the axis to J_3 direction and this Material Point occupies a small (shrink) Moment of Inertia by rotating about the Ellipsoid-Symmetrical axis through constant Point O, on Ellipsoid-axis, of the truncated Cone, The Lorentz factor $\gamma \equiv \sec \varphi$ in PNS-Space doesn't issue because $J_1 \cdot \cos \vartheta$ is always equal to J_3 and $c = \text{constant}$. The Algebraic-magnitude-figure of velocity, u , is equal to w_3 and as $\frac{d\psi}{dt}$ and to, w , also.

In this case, the direction of the Angular-velocity-vector $\bar{w}_z$ is diverging to the $\bar{k}$ axis of the Central-Truncated-Ellipsoid and Angular-velocity, u , occupies, low and high values.

This Phenomenon happens in Astronomy where Equator-Points, i.e. on Celestial-Sphere traces of sections ($\bar{s}_0$) of the Planes of ecliptic ($\bar{k}$) and Ecuador ($\bar{k}$), are slowly moving on Zodiac circle with an approximate Period of 21000 years. Due to Earth-Geoid, Precession of Equator-Points is proved to become from Rotation of the Earth Polar-axis perpendicular to the Ecliptic and thus Not Producing any Work.

e_c . In Material-Point, where exist the Prior External forces as Energy $Q = hf$ and from equation (27a) Angular-velocity $u = |\bar{w}| = \frac{d\varphi}{dt} = \frac{J_3 \cdot w_3}{2 J_1 \cos \vartheta} \pm \sqrt{-\frac{sQ}{J_1 \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cos \vartheta}\right)^2}$ it becomes the Quaternion $\bar{w} = [s \pm \bar{v} \cdot i]$, where the Algebraic-magnitude becomes for Angular-velocity $u = |\bar{w}| = \frac{d\varphi}{dt} = \left[\frac{J_3 \cdot w_3}{2 J_1 \cos \vartheta}\right] \pm \left[\frac{k_{PNS}}{2 J_1 \cos \vartheta}\right] \cdot i = s \pm v \cdot i \dots (e_c 3)$ where $s = \left[\frac{J_3 \cdot w_3}{2 J_1 \cos \vartheta}\right]$, $\bar{v} = \left[\frac{k_{PNS}}{2 J_1 \cos \vartheta}\right]$, $k_{PNS} = \sqrt{[J_3 \cdot w_3]^2 - 4 \cdot sQ \cdot J_1 \cos \vartheta}$, the PNS constant and i , the imaginary Part as $i^2 = -1$. i.e.

In PNS, Material-Point is a Quaternion-Monad of DUAL-Angular -Momentum as $\rightarrow a-b$ -Real $\equiv$ The Existing-Universe, and as c -Imaginary $\equiv$ The Black-Holes.

Because velocities $\bar{v}$ differ that of $\bar{c}$ light then this analogous is as to Lorentz factor $\gamma \equiv \sec. \psi$, where issues $\rightarrow \bar{c} = w_3 \cdot \sec \psi = w_3 \cdot \gamma = w_3 \cdot \vartheta_A \cdot t = \left(\frac{v_A}{\sqrt{c^2 - v^2}}\right) \cdot t = \left(\frac{v_A}{\sqrt{c^2 - v^2}}\right) \cdot t \leftarrow$

The Angular-Kinetic-Energy $\bar{B}$, Angular momentum vector $\bar{B}$, is conserved, so $\frac{d\bar{B}}{dt} = 0$ and since may be expressed in terms of the moment of Inertia Tensor J , and the Angular velocity vector, $\bar{w}$, so then according to (21a -21b), [70] the ellipsoid of Angular velocity vector is $J_1 w_1^2 + J_2 w_2^2 + J_3 w_3^2 = 2L$ where Kinetic-Energy $L = \frac{\bar{w}^2 J_n}{2}$, and, w , is on the surface of the Inertial Ellipsoid. The tangent-normal Plane at $\bar{w}$, is $\nabla \frac{\bar{w} J_n}{2} = \nabla \frac{1}{2} [J_1 w_1^2 + J_2 w_2^2 + J_3 w_3^2] = [J_1 w_1 + J_2 w_2 + J_3 w_3] = \bar{B}$ i.e. The Tangent-normal-Plane is constant and at a distance $\frac{\bar{w} \cdot \bar{B}}{|\bar{B}|} = \frac{2L}{|\bar{B}|}$ which is also constant, Or from $\bar{B} \cdot \bar{w} = L = \frac{1}{2} J_1 w_1^2 + \frac{1}{2} J_2 w_2^2 + \frac{1}{2} J_3 w_3^2$, where w_1, w_2, w_3 , are the components of vector $\bar{w}$, along the Principal axes, and J_1, J_2, J_3 , are the Principal-moments of Inertia, (Fig.13) Thus, the conservation of Kinetic-Energy, L , imposes a constraint on the three-dimensional Angular-velocity-vector, $\bar{w}$, and an Ellipsoid in the Principal axis frame, which is The Inertia Ellipsoid J .

The Ellipsoid axes values are the half of the Principal - moments of Inertia, and the Path traced-out on this Ellipsoid by the Angular velocity vector, $\bar{w}$, is the Polhode.

This is the analogous which happens to Lorentz factor $\gamma \equiv \sec. \varphi$ where then issues for velocity $u = \bar{c} = w_3 \cdot \sec \vartheta = w_3 \cdot \gamma = w_3 \cdot \vartheta_A \cdot t = \left(\frac{v_A}{\sqrt{c^2 - v^2}}\right) \cdot t = \left(\frac{v_A}{\sqrt{c^2 - v^2}}\right) \cdot t$. Above case is that where $\oplus$, constituent Is-Rolling around, z , axis on Small-circles.

Because of the constant Stress, σ , and Angular velocity w_2 , Momentum $\bar{B}$ is containing another term on $\bar{k}$ axis, $\bar{k} J_3 w_3$ with much greater Algebraic-figure, and this because during rolling on semicircle, another curve $R < r$ on $\ominus$ constituent executes greater number of turns about its axis, x and $J_3 = \frac{\pi R^4}{4} < \frac{\pi r^4}{4}$ and the difference moment of Inertia is $J_D = \frac{\pi}{2} (r^4 - R^4)$.

Angular velocity w_3 becomes greater to w_2 as it is, $J_R > J_2$. The first derivative of this term under the restriction $w_2 = \text{constant}$ becomes, $\frac{d\bar{B}}{dt} = J_3 w_3 \frac{d\bar{k}}{dt}$, where $\frac{d\bar{k}}{dt} = \bar{i} w_2 = \bar{i} \frac{v}{r}$, so for the continuity of motion is needed a couple of forces at the end Points of axis such that the moment is $\bar{M} =$

$\bar{I} J_D w_3 w_2 = \bar{I} J_D w_3 \cdot \frac{v}{r}$. Reactions are created at the ends of, z, axis and for 2R distance then Reaction is force $F = \frac{J_D w_3 w_2}{2R} = \frac{J_D w_3 v}{2R^2} = \frac{J_D v^2}{2R^2 r} = \frac{\pi (r^4 - R^4) \sigma^2 (3 + \sqrt{5})}{2R^2 r \cdot r^2} = \frac{\pi \sigma^2 (r^4 - R^4) \cdot (3 + \sqrt{5})}{2 R^2 r^3}$ which is the Gyrostatic reaction of motion. [70]

The vertical force $Q = \frac{u\bar{B}}{s} = \frac{u\bar{B}}{R} = \frac{\frac{\sigma}{r}[1 + \sqrt{5}] \cdot \pi r^3 \sigma}{8} [1 + \sqrt{5}] = \frac{[\pi \sigma^2 (3 + \sqrt{5})]}{8 \cdot R}$ and for rotation the needed-moment is $M = Q \cdot (r^2 - R^2) = \frac{[\pi \sigma^2 (r^2 - R^2) (3 + \sqrt{5})]}{8}$ with Reactions on perpendicular to y, axis. For Planck's length and ratio $k = \frac{R}{r} = 0,5$ the above become in Algebraic figures

$$F = \frac{\pi \sigma^2 (r^4 - R^4) \cdot [\Phi]^2}{R^2 r^3} = \frac{\pi \sigma^2 (1 - k^4) \cdot [\Phi]^2}{2 k^2 r} = \frac{\pi \cdot 17,04 \cdot 10^{-54} \cdot 0,75 \cdot 5,236}{2,025 \cdot 4,453 \cdot 10^{-35}} = 9,442 \cdot 10^{-18} \text{ N [1Kg.m/s}^2\text{]}$$

$$Q = \frac{[\pi \sigma^2 [\Phi]^2]}{4 \cdot R} = \frac{[\pi \sigma^2 (3 + \sqrt{5})]}{8 \cdot k r} = \frac{\pi \cdot 17,04 \cdot 10^{-54}}{8,05 \cdot 4,453 \cdot 10^{-35}} = 3,000 \cdot 10^{-19} \text{ N [1Kg.m/s}^2\text{]}$$

$$M = \frac{[\pi \sigma^2 (r^2 - R^2) [\Phi]^2]}{4} = \frac{[\pi \sigma^2 r^2 (1 - k^2) [\Phi]^2]}{4} = \frac{\pi \cdot 17,04 \cdot 10^{-54} \cdot 0,75 \cdot 19,829 \cdot 10^{-70} \cdot 5,236}{8} = 1,327 \cdot 10^{-121} \text{ KN.m}$$

In Fig-12-1, the Forces, F, Q, applied on lever-arms, r, and, R, which are both in the Material-Point-System, are differing on the Moment of Inertia J_r and J_R values, of the sketching circles of rotation. Since momentum $m = Q / s$ then momentum due to Spin $= \bar{B} = 3,000 \cdot 10^{-19} \text{ [1Kg.m/s]}$.

Conclusion b:

The Tangent-normal-Plane is constant and $\perp \bar{B} = J \cdot \bar{\omega}^2$, at a constant distance $\frac{\bar{\omega} \cdot \bar{B}}{|\bar{B}|} = \frac{2\bar{L}}{|\bar{B}|}$. Since Angular-velocity $\bar{\omega}$ is a vector and Rotates in one axis k with respect to variable $\bar{B}$ Momentum, then is the Ellipsoid of $|\bar{\omega}| \equiv$ Quaternion of dimension Power $(s \pm \bar{v} \nabla i)^1/d$. Since J-Ellipsoid $|\bar{\omega}|$ becomes from eq- ($e_c 3$) which gives two Anti-Symmetrical Inertial Ellipsoids in their Polhode and Herpolhode Cones, therefore from Fig-12-3,

- $\Rightarrow$ The-Real $\bar{\omega} \equiv \{\text{Polhode} \equiv \text{Cone OPS, Herpolhode} \equiv \text{Cone OPT, } [\cup \text{ Rolling}] \text{ on the Ellipsoid axis, } \downarrow \text{ Normal ON the Unmovable \& Attitude-Plane of the [PSPT] Truncated-Polar-Cone}\}$.
- $\Rightarrow$ The-Imaginary $\bar{\omega} \equiv \{\text{Polhode} = \text{Cone OPS, Herpolhode} = \text{Cone OPT } [\cup \text{ Rolling}] \text{ on the Anti-Symmetrically-Ellipsoid-axis, } \uparrow \text{ Normal ON the Unmovable \& Attitude-Plane of the [PSPT] Truncated-Polar-Cone}\}$.

6e: The Eternal Wave Nature of Monad $\overline{AB}$ and the Electromagnetic Fields

(1) (2) (3) (4)

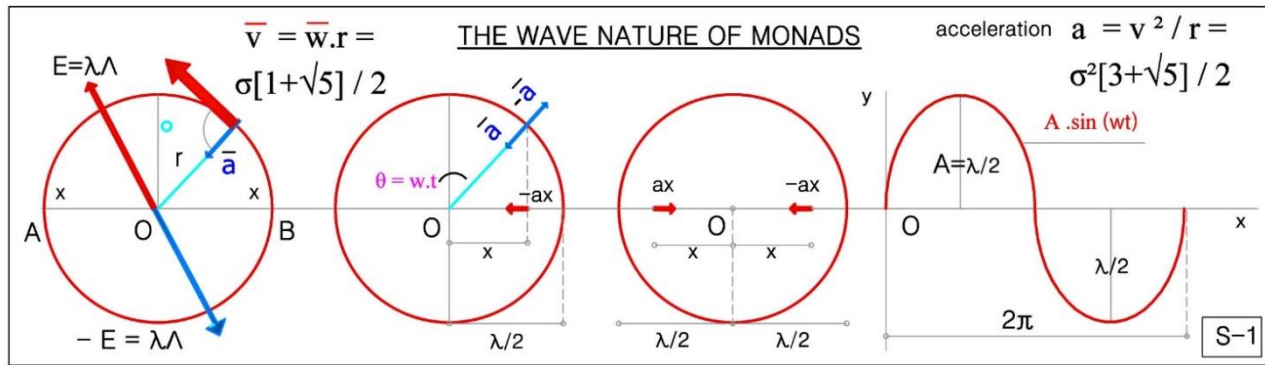


Figure 14: The Wave nature of the Material-Point-Monad AB. [72-a]

In (1), are shown Velocity, $|\vec{v}| = \omega \cdot 2r = \frac{2\pi}{T} \cdot r = 4\pi r$. $f = [\frac{\sigma}{2}] \cdot (1+\sqrt{5})$, the Angular velocity $|\vec{\omega}| = \frac{\sigma}{2r} [1 + \sqrt{5}]$ and the Golden-ratio-Frequency $f = \frac{(1+\sqrt{5}) \cdot \sigma}{4\pi r} = \frac{\sigma \Phi}{2r}$ in cave, $2r$. In (2), are shown Centripetal, $\vec{a} = v^2/r$, and Centrifugal, $-\vec{a} = v^2/r$, acceleration in cave, r . In (3), are shown the Projections on AB axis of Centripetal, $\vec{a}_x$, and Centrifugal, $-\vec{a}_x$ acceleration in cave, $2r = \lambda$. Note that Waves transfer Energy but Not mass. In (4), is shown the Sinusoidal - motion of the Centripetal, $\vec{a}_x$, and Centrifugal, $-\vec{a}_x$, acceleration in cave, $r = \lambda/2$. Following Analysis in [33] then, Monad $|\vec{AB}| = r = \lambda/2$ is the ENTITY $\equiv$ Space, and $[A, B - \vec{P}_A, \vec{P}_B]$ is the CONTENT $\equiv$ the Energy which is the LAW, so Entities are embodied with the Laws. Entity is quaternion $\nabla i = [s + \vec{v} \nabla i]$ with Real Part $|\vec{AB}| =$ The length $r = s = \lambda/2$ between Points A, B and Imaginary part the equal and opposite forces $\vec{P}_A, \vec{P}_B$, such that $\vec{P}_A + \vec{P}_B = 0$, and In Primary-Neutral Space [PNS] the Dipole $|\vec{A} \cup \vec{B}| = [\lambda, \Lambda]$ in [PNS] are composed of the two elements λ, Λ which are created from Points A, B only, where Real Part $|\vec{AB}| = \lambda/2 =$ wavelength (dipoles) and from the embodied Work $\vec{B}\vec{\omega} = 2L$, where the Imaginary Part $\vec{B} = (r \cdot dP) = \vec{r} \times \vec{p} = L \cdot \omega = [\lambda \cdot p] = \lambda \cdot \Lambda = \vec{B} = \frac{h}{2\pi}$, the momentum $\Lambda = \vec{B}$ and the Forces $dP = \vec{P}_B - \vec{P}_A$ are the stationary sources (the excitation sources) of the Space -Energy field. [22-23-25].

The moving charges is velocity, $\vec{v}$, created from the eternally rotated main stresses, $\pm \sigma$, forming the dipole momentum vector, $\pm \vec{\Lambda}$, when is mapped on the perpendicular to Λ Plane as $\rightarrow \vec{v} E \parallel dP$ and $\vec{v} B \perp dP$. Since $(dP \perp \pm \vec{\Lambda})$ the work occurring from momentum $\vec{p}$ is $\vec{p} = m\vec{v} = \Lambda$ acting on force dP , $d\vec{P}$ is zero, so momentum $\vec{\Lambda} = m\vec{v}$ only is exerting the velocity vector $\vec{v}$, onto the dipole, $\lambda/2$, with the generalized mass m (the reaction to the change of velocity $\vec{v}$) which creates the component forces, $F_E \parallel dP \cdot \vec{v}$ and $F_B \perp dP \times \vec{v}$. Magnitude $|A| = r \cdot \sin \theta$. The Dipole momentum $\{\Omega = (\lambda, \Lambda) = \text{Spin}\}$ is the rotating total Energy on dipole $\vec{AB}$ and mapped on the perpendicular to Λ Plane as, velocity $\vec{v}$, mass m , on radius, r , to $AB/2 = \lambda/2$.

From (1) velocity $\vec{v}$ is created from the Centrifugal force $\vec{F}_f = -\sigma$ and from the equal and opposite to it Centripetal force $\vec{F}_p = +\sigma$ with acceleration $\vec{a}$, and the meter of x , component equal to a $\sin \theta = a \cdot (x/A) = (a/A) \cdot x$. The equation of motion then becomes $m \cdot (d^2x/dt^2) = - (a/A) \cdot x$ with the general solution, $x = C_1 \sin \theta + C_2 \cos \theta = C_1 \sin \omega t + C_2 \cos \omega t$, where $\omega^2 = (a/Am)$, C_1, C_2 , constant and for $\theta = 0$ then $v = v_0 = \omega \cdot r = \omega \cdot \lambda/2 = (\omega \lambda)/2$ and $x_0 = A = \lambda/2$, where $A =$ The amplitude of oscillation, and when $x = 0$ then $A = \lambda/2 = r$. Above equations define the wave nature of Inner motion of monad AB.

The Period of the Harmonic vibration is $T = 2\pi\sqrt{A/a}$, and Displacement x , from the centre is $x = A.\sin[\sqrt{\frac{A}{a}} \cdot t] = A.\sin[\sqrt{\frac{A}{\sigma}} \cdot t] = A.\sin(\omega t) \dots\dots(1)$ i.e.

The Harmonic-Vibration is Sinusoidal - motion with $\omega^2 = \left(\frac{A}{\sigma}\right)$, where for material Point acceleration $a \equiv \sigma \equiv$ Principal-stress. Considering motion from time $t = 0$ where motion passes through O , ($x = 0$) with velocity $\mathbf{v}_0 // O\mathbf{x}$, then Displacement $x = \mathbf{v}_0 \cdot \sin \omega t = A.\sin[\sqrt{(a/Am)} \cdot t + \pi/2] = A.\sin[\sqrt{(\sigma/Am)} \cdot t + \pi/2]$ Velocity $\dot{x} = dx/dt = \mathbf{v}_0 \cdot \omega \cdot \sin \omega t + \pi/2 = A \cdot \sqrt{(a/Am)} \cdot \sin [\sqrt{(a/Am)} \cdot t + \pi/2] \dots\dots (2)$

Acceleration $\ddot{x} = d^2x/dt^2 = -\mathbf{v}_0 \cdot \omega^2 \cdot \sin \omega t + \pi = (a/m) \cdot \sin [\sqrt{(a/Am)} \cdot t + \pi] = -(a/Am) \cdot x = -(2a/\lambda m) \cdot x$, or $\ddot{x} = -(2a/\lambda m) \cdot x$ i.e. The amplitude of oscillation (x_{maximum}) is equal to the constant $\mathbf{v}_0 / \omega$ while the period T of a complete oscillation to the constant $2\pi / \omega$ as, $\omega = 2\pi / T = 2\pi f = \sqrt{(a/Am)}$ where $f =$ frequency and solving for, a , then acceleration a is $a = \sigma = (2\pi / T)^2 \cdot (Am) = \omega^2 \cdot (Am) = \omega^2 \cdot (\lambda m) / 2, \dots\dots (3)$ And for the material Point where, $m = \frac{2E}{a_a} = \left[\frac{\bar{\mathbf{B}} \cdot \bar{\omega}}{\bar{\mathbf{B}} \times \bar{\omega}}\right] \cdot J$ then, $a = \sigma = \omega^2 \cdot \left[\frac{\bar{\mathbf{B}} \cdot \bar{\omega}}{\bar{\mathbf{B}} \times \bar{\omega}}\right] \cdot \frac{\pi r^4}{2} \dots (4)$ i.e. Monads $|\bar{\mathbf{A}}\bar{\mathbf{B}}|$ are Waves or, of Wave nature, with Angular-velocity $\bar{\omega}$

$$\omega = \sqrt{\left(\frac{A}{a}\right)} = \sqrt{\left(\frac{r}{a}\right)} = \sqrt{\left(\frac{r}{g}\right)} = \sqrt{\left(\frac{r}{\sigma}\right)}, \text{ and Angular - Momentum } \bar{\mathbf{B}} = J \cdot \omega^2 \text{ Synopsis } \mathbf{e}_c$$

The Material-Point is the discrete continuity Content $\equiv |\{\oplus + \ominus\}| =$ The Quantum through mould of Space -Anti-space in itself which is the material dipole in inner monad Structure and is Identical with the Electromagnetic cycloidal field of Energy monads. This is, the Energy-distance $\equiv$ The Form $\rightarrow \frac{\bar{\omega} \cdot \bar{\mathbf{B}}}{|\bar{\mathbf{B}}|} = \frac{2\bar{L}}{|\bar{\mathbf{B}}|} \leftarrow$ and consists the deep concept of Material- Geometry, i.e. Material-Point becomes as, DISCRETE-FORM, from Euclidean-Point which is the CHAOS, by its Eternally - Moving-Content $[\oplus \cup \ominus] \rightarrow$ the in Mode Content of existence, which is the Energy Quanta in Mechanics. In Article is clarified the How, the When and the Why CHAOS, becomes DISCRETE, and thus Joining Euclidean - Geometry - Mechanics - Physics in One Unity and with the same Universal Laws, from Zero $\equiv$ Non-existence $\equiv$ Chaos, to Discrete, to Microcosms and Macrocosms.

In Primary-material-Point, Form (distance = r) and Content, $[\oplus \cup \ominus]$, is constant while in all others issues the law of transformation of Quantity into Quality, and this is extended from the smaller Particle to the largest phenomena, i.e. in all levels of the Energy-Space Universe. Form (distance = r), of Material Point AB , {the two Spherical constituents, $[\ominus \equiv K_o, K_o B] - [\oplus \equiv K, KB]$ } of Space Point, $A (\oplus)$ and Anti-Point, $B (\ominus)$ and created on STPL Mould, by the rotating velocity vector $\mathbf{v}_A = \omega \cdot r$, is thus forming the material angle, $\vartheta = \vartheta_A \cdot t = \left(\frac{v_A}{\sqrt{c^2 - r^2}}\right) \cdot t$, which in turn $\{r \text{ and } \vartheta\}$ create the Envelope of Harmonic-Vibration-curves on this, r, ϑ Rotating STPL - line. In [58], Quantity into Quality transformation can be seen in many levels as, the velocity $\mathbf{v}_A$ of any Point A , in Primary-Dipole AB which creates Infinite Free Harmonic Vibrations on AB monads, following Euler-Savary mechanism where Rolling motion is transformed to the Vibration

curves, and on different waves which properties is determined by the number of oscillations per second, i.e. The frequency related to vibrations is the quantitative change giving rise to different kinds of the wave-signals. Increasing the rate of vibrations turns the colours from Red indicating low frequency, to Orange -Yellow, to Violet, to the invisible Ultra-violet and, X-rays, and gamma rays to B-Holes rays, Because →

From Inner-velocity equation → $v = wr = (2\pi/T)r = 2\pi.f_1 r$, wavelength $\lambda = cT = c / f_1$, cave $r = n.[\lambda/2]$ and → $r = n.(c / 2f_1)$ and since also $v = 2\pi.f_1 [n.c/2f_1] = n.\pi.c$ or → $v = n.\pi.c$ ← and thus showing velocities in lobes are, $n.\pi$ times that of light, and for $n = 1$ then $v = \pi.c$ i.e. more than 3 times the light velocity. Reversing the Process at the lower end, we go from infrared and heat rays to radio-waves, as in [39]. Also the changing of Temperature offers no resistance to electric-currents, and for Helium which is the only substance which cannot be frozen because is in Primary-Form and occupies the Critical - Energy Quantity CEQ as before. Instead, a Particle's intrinsic Angular-momentum is just another Property that it has, like charge or mass, which is the structure of Space itself.

Since for any mass exists $m_e = \Delta.\pi$, in caves issues $w^2.m = 4\pi^2.f^2.m = k$, a constant then, From Orbit-frequency $f^2 = \frac{1}{4\pi^2} \left(\frac{k}{m}\right)^2 = \frac{1}{k r^3}$ and $k^2 = \frac{4\pi^2 m}{r^3}$ then $k = 2\pi^2 \sqrt{\frac{m}{r^3}}$ and from $k = \frac{4.\pi^2.m.f^2}{1} = \frac{1}{f^2 r^3}$ then $f^4 = \frac{1}{4\pi^2 m r^3}$ and $f_c = \sqrt[4]{\frac{1}{4\pi^2 m r^3}} \Rightarrow$ The Strength of Caves.

7e: The Dual Quadratic Equation, Types

1.. The DUAL Momentum $\bar{B}$ & $\bar{w}$ ANALYSIS for Real & Imaginary Constructions. Space is the Position of Points, as in Introduction referred and explained, filled with Energy Quanta as tiny Electromagnetic wave cycloidal caves.

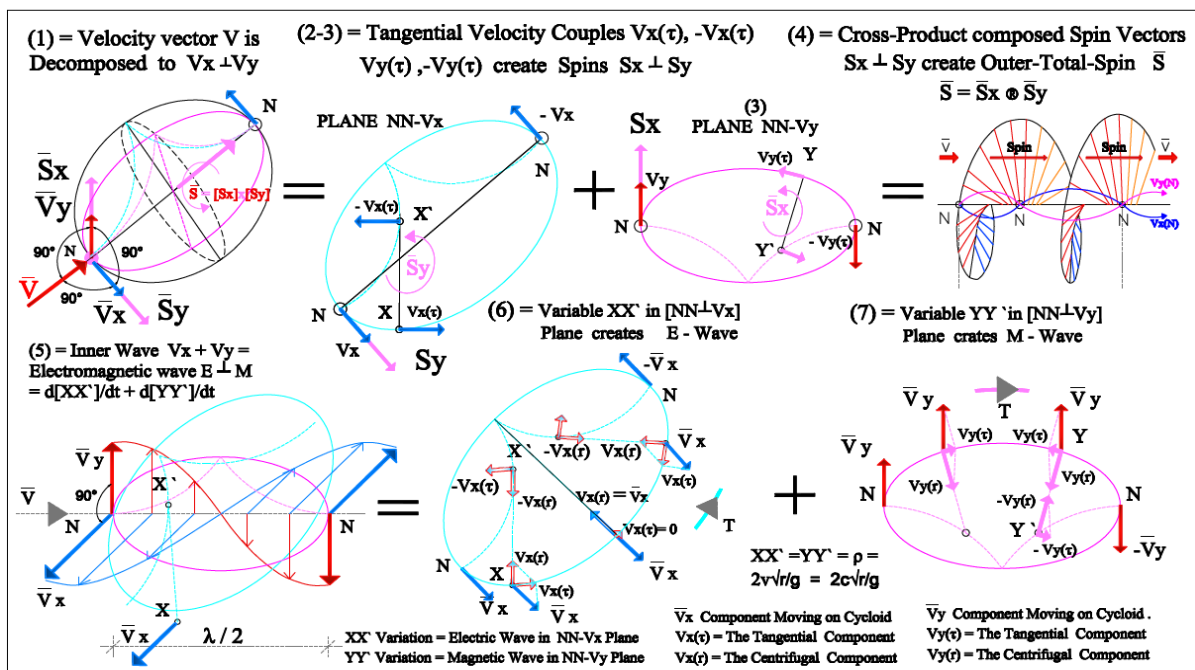


Figure 15: The Mechanism of Angular Momentum-Spin $\bar{B}$ in Particles and their Curl-motion

Energy is the Cause of motion, the change of Position of Points and it is motion itself. Mass is the Reaction to the motion, it is an Index of the amount of motion, and it is a numeric magnitude which has Nothing to do with Energy. [58] The Collision between velocity vector $\bar{v}$, and a Unit NN, Producing the two transverse $\perp$, Electromagnetic-Waves and Spin as Torque $[\cup \cup]$ which creates the motion of Unit. Outer Spin of Particles creates the, $E \perp P$, Inner Waves and in tern Inner Spin as Torque which is Recycled. The in between distance $\rightarrow [10^{-62} -- 10^{-35}] \equiv \text{Vacuum}$.

In mechanics – Physics, Change, is that of Space ds , and it is the velocity vector $\bar{v}$, that of change of velocity vector and it is acceleration $d\bar{v}$, 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. The Second-order differential equation excited by an Harmonic external force $F_t \sin wt$ is as, $m \frac{d^2x}{dt^2} + c \frac{dx}{dt} + kx = F_t \sin wt$, or $m \ddot{x} + c \dot{x} + kx = F_t \sin wt$. corresponds Physically to the free damped vibration, where x = the displacement, $dx / dt = \dot{x}$ the velocity and $d^2x / dt^2 = \ddot{x}$ the acceleration of monad, and m, c, k constants with general solution given by the equation $x = A. e^{s_1.t} + B.e^{s_2.t} + X \sin(wt-\phi) \dots\dots(1)$

In Electromagnetism, Change, say a Space- monad is $\rightarrow$ a Resonance which can occur in the RLC circuit, where Resistance R , is the change in current amount it is the converter of current, Inductance L , is like mass or Inertia in Mechanical Systems which store the Magnetic-energy and, Capacitance C , concentrates $(\pm)$ charge which store the Electric-energy in much the same way that springs store mechanical energy inverse Spring constant, is the analogous. The differential equation excited by a Harmonic Electromotive force $E_t \sin wt$, in an RLC circuit, oscillating at its natural frequency is as $\rightarrow L \frac{d^2q}{dt^2} + R \frac{dq}{dt} + \frac{1}{C} q = E_t \sin wt \leftarrow$ corresponds Physically to the free damped vibration, where Charge q = is the Physical property of matter that causes it to experience a force which can be Positive or Negative, dq / dt = the least quantized amount of charge and, d^2q / dt^2 , the space distribution of charge and L, R, C Inductance, Resistance, Elastance constants, with general solution given by the equation $q = A. e^{s_1.t} + B.e^{s_2.t} + X \sin(wt-\phi) \dots\dots(2)$

Equations (1) and (2) give the analogic relation of the Classical Mechanics [Space Position x], and the Electromagnetism [Quanta of energy q] of Storing and Removing of energy in this Energy-Space cosmos. Since energy (=motion) $E = hf$ and frequency $\bar{f} = \frac{\sigma \cdot \Phi}{2\pi \cdot r_n}$, then $E = \frac{\sigma \cdot \Phi h}{2\pi \cdot r_n}$

From Mechanic-Static, for $\sigma_1 = 0$, the Pure Shear state, Stress-Equation $\sigma_{1,2} = \sigma_1 / 2 \pm (1/2) \cdot \sqrt{\sigma_1^2 + 4 \cdot \sigma_2^2}$ becomes $\sigma_{\text{EQUAL}} = \tau_{12} \cdot \sqrt{3}$. and consists the Flow-limit $\equiv$ the Safety – Factor-Range for Actions according to the Static equivalence of Stresses (intensities). From Eq (27a)

$$\rightarrow \text{Angular-velocity } |\bar{w}| = \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} \pm \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} = s \pm \{\sqrt{\bar{D}}\} \cdot i \leftarrow$$

A Quadratic equation as $s = \left[\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right]$, $\bar{D} = \left[\frac{k_{\text{PNS}}}{2 J_1 \cdot \cos \vartheta}\right]$, $k_{\text{PNS}} = \sqrt{[J_3 \cdot w_3]^2 - 4 \cdot sQ \cdot J_1 \cos \vartheta} = \text{PNS}$ constant in where $\bar{B} \cdot \bar{w} = 2L = J \cdot w^2$, and The frequency-monad of rotation in PNS Space $\rightarrow f_{\text{PNS}} = \frac{sQ}{2\pi \cdot J_2 \cdot w} \leftarrow$ with the following 4-Solutions for $|\bar{w}|$.

Solution-1 $\Rightarrow |w_1| = [s] + [\sqrt{D}] \rightarrow \text{Real Root} \equiv \text{Huge Minerals at Edge of Universe.}$

Solution-2 $\Rightarrow |w_2| = [s] - [\sqrt{D}] \rightarrow \text{Real Root} \equiv \text{Atoms \& Compounds into Structures.}$

Solution-3 $\Rightarrow |w_3| = [s] + [\sqrt{D}].i \rightarrow \text{Imaginary Root} \equiv \text{Huge BH at centres of Galaxies.}$

Solution-4 $\Rightarrow |w_4| = [s] - [\sqrt{D}].i \rightarrow \text{Imaginary Root} \equiv \text{Micro BH at centre of Molecules.}$

From 4-above issues:

$$\begin{aligned} \text{A-Velocity } |\overline{w_1}| &= \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} \pm \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} \equiv \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} + \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} \\ \text{A-Velocity } |\overline{w_2}| &= \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} \pm \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} \equiv \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} - \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} \\ \text{A-Velocity } |\overline{w_3}| &= \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} \pm \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} \equiv \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} + \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} \cdot i \\ \text{A-Velocity } |\overline{w_4}| &= \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} \pm \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} \equiv \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} - \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} \cdot i \end{aligned}$$

The $|\overline{w_3}|$ Solution is the Imaginary-Root giving the Tapered-Amplitude Structions.

The $|\overline{w_4}|$ Solution is the Imaginary-Root giving the Black-Holes Structions.

Energy Formulas:

Force = m a = m g $\rightarrow [1\text{gr.1cm/s}^2 = 9,81.10^5 \text{ 1dyn}] \Rightarrow \text{Dyn}$

Energy = F s $\rightarrow [1\text{dyn.1cm} = 10^7 \text{ erg} = 9,81 \text{ Joule}] \Rightarrow \text{Kg. m} \equiv \text{Work-W.}$

Energy = F d = $\frac{1}{2} J \cdot w^2 \rightarrow 2.F d = J \cdot w^2 \rightarrow w^2 = \frac{F \cdot d}{J} = \frac{N \cdot m}{\pi \cdot d^4 / 2} \Rightarrow \text{Kg. m}$

Power = $\frac{1\text{Joule}}{1 \text{ sec}} = 1 \text{ Watt} = F \cdot \left[\frac{s}{t}\right] \rightarrow [1000.W = 102 \frac{\text{Joule}}{\text{sec.}}] \Rightarrow \text{Kg. m / sec}$

Power = F v = $\frac{dW}{dt} = \frac{d(r \cdot \theta)}{dt} = T \cdot \left[\frac{d\theta}{dt}\right] = T w = \text{Torsion} \cdot \text{Angular-velocity} = \text{Force} \cdot \text{velocity.}$

Intensity-Power = $P = \frac{V^2}{R} = \frac{1\Omega^2}{1\text{Cu}} = \{\text{Ampere}\}.$

Intensity = Current = $\frac{\text{Voltage}}{\text{Resistance}} = I = \frac{V}{R} = \frac{1\Omega}{1\text{Cu}} = \{\text{Ampere}\} = V p = \{\text{Ohm} \cdot \text{Pascale}\}$

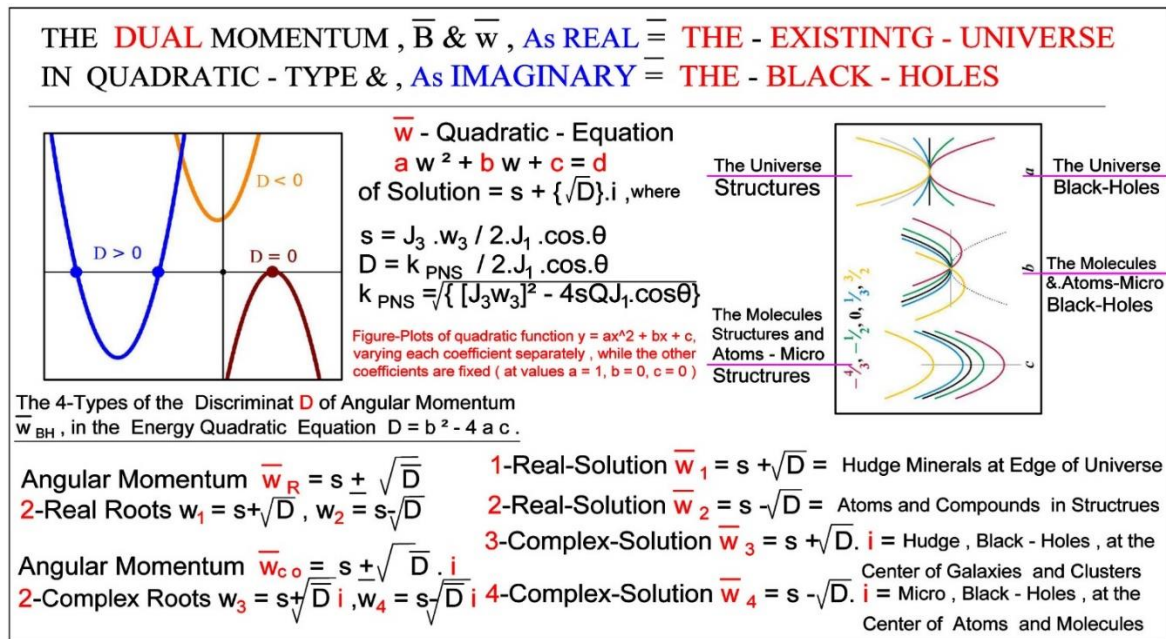


Figure 16: Black-Holes Angular Momentum $\bar{w}$ & $\bar{B}$ Mechanism in Particles and Universe.

The Solution-1 $\Rightarrow$ Is a distinct Real-valued of the Huge-Angular-velocity-Energy which corresponds to very far away Heavy Galaxies and Clusters.

The Solution-2 $\Rightarrow$ Is a distinct Real-valued of a Minimal-Angular-velocity-Energy which corresponds to Atoms & Compounds into all Structures.

The Solution-3 $\Rightarrow$ Is a distinct Complex-valued of a Huge-Angular-velocity-Energy which corresponds to very far away Black - Holes at the Centres of very Heavy Galaxies and Clusters

The Solution-4 $\Rightarrow$ Is a distinct Complex - valued of a Minimal-Angular-velocity-Energy which corresponds to Atoms & Compounds into all, the Micro at centre of Molecules and of far away Galaxies and Clusters Black - Holes Structures.

The Analysis of the DUAL $\rightarrow$ Existing - Universe and Black-Holes $\leftarrow$ System Solutions undergoing Harmonic excitation as equation $m\ddot{x} + c\dot{x} + kx = F_t \sin wt$. are the Particular, $|\bar{w}| = s \pm \{\sqrt{\bar{v}}\}$, where the Integration constant is $I_{PC} = \frac{1}{2m} \sqrt{k^2 - 4mc}$ and $k^2 > 4mc$ giving the distinct Real-values, with Amplitude $A_{PC} = \frac{\bar{v} - \bar{c}}{I_{PC}}$ and Displacement $x = A_{PC} \cdot e^{-[\frac{k}{2m}].t} \cdot \sin(I_{PC} \cdot t)$, with the constant Amplitude $A_{PC} = \frac{\bar{v} - \bar{c}}{I_{PC}}$, and the, General, $|\bar{w}| = s \pm \{\sqrt{\bar{v}}\}.i$, where the Integration constant is $I_{GC} = \frac{1}{m} \sqrt{4mc - k^2}$, and $k^2 < 4mc$ giving the distinct But Imaginary-values with the decreasing Amplitude $A_{GC} = [\bar{v} = \bar{c}]. \sqrt{\frac{m}{c}} \cdot e^{-[\frac{k}{2m}].(t + \frac{\pi}{I_{GC}})}$, and Displacement $x = A_{GC} \cdot e^{-[\frac{k}{2m}].t} \cdot \sin(I_{GC} \cdot t)$

Since Amplitude Decreases with time, and for an Period T issues $A2_{GC} = A1_{GC} \cdot e^{-[\frac{k.T}{4m}]}$, or $\ln A1_{GC} - A2_{GC} = [\frac{k.T}{4m}] = \frac{\pi k}{\sqrt{4mc - k^2}}$, then Amplitude becomes Zero which means $x \rightarrow$ BLACK - HOLE $\leftarrow$

In Fig-16 is shown The HOW Angular Momentum $\bar{\mathbf{w}}$ & $\bar{\mathbf{B}}$ Mechanism Become such the Particles and Universe, and as the Black-Holes. The Material Point is of Quaternion-type $\rightarrow$ Real and Imaginary $\leftarrow$ as $|\bar{\mathbf{w}}| = [s \pm \bar{\mathbf{D}}.i]$ and for a Quaternion-Monad which is of DUAL-Angular-Momentum, The Real-Part is $\rightarrow s \equiv$ The Existing-Universe, and Imaginary-Part is $\rightarrow \pm \bar{\mathbf{D}}.i \equiv$ The Black-Holes. Angular-Momentum $|\bar{\mathbf{w}}| = [\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}] \pm [\frac{k_{PNS}}{2 J_1 \cdot \cos \vartheta}] . i$, where $s = [\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}]$, $\bar{\mathbf{D}} = [\frac{k_{PNS}}{2 J_1 \cdot \cos \vartheta}] \mathbf{k}_{PNS} = \sqrt{[J_3 \cdot w_3]^2 - 4 \cdot s Q \cdot J_1 \cos \vartheta}$, the PNS constant, where $\bar{\mathbf{B}} \cdot \bar{\mathbf{w}} = 2L = J \cdot w^2$, and The frequency-monad of Rotation in PNS -Space is $\rightarrow \mathbf{f}_{PNS} = \frac{s Q}{2\pi J_2 \cdot w} \leftarrow$

It was shown in [70]P-53 that,

1. Rotational-Momentum Ellipsoid $\bar{\mathbf{B}} \equiv$ Work $\equiv \bar{\rho} \rightarrow$ The Energy-vector
2. Angular-Velocity-Inertial-Ellipsoid $\bar{\mathbf{w}} \equiv$ Force $\equiv \bar{a} \rightarrow$ The Space - vector
3. Reaction to velocity-change-Inertial $\mathbf{J}_a \equiv$ Mass- scalar $m \equiv J_a \rightarrow$ The Mass - meter

Since Angular-velocity $|\bar{\mathbf{w}}| \equiv$ a vector, Rotates in one axis k with respect to the one variable only and as this happens IN {PNS-Space, Atoms-Space, Objective-Reality and in Universe} Then Quaternion - Momentum, $\bar{\mathbf{B}}$ & $\bar{\mathbf{w}}$, and $W \equiv$ Motion are of DUAL - TYPE, such in Microcosm, as in Macrocosm, or Both as Omnipresent.

1. The DUAL-Momentum $\bar{\mathbf{B}}$ & $\bar{\mathbf{w}}$, as Real $\equiv$ Existing-Universe, Imaginary $\equiv$ Black-Holes
2. The DUAL - Photon, as Real $\equiv$ Space $\equiv$ Particle and, Imaginary $\equiv \{E \Rightarrow M - \text{Wave}\}$.
3. The DUAL - Spin $\bar{\mathbf{B}}$, as Real $\equiv$ Space $\equiv$ Gravity and, Imaginary $\equiv \{\text{Anti - Gravity}\}$.
4. The DUAL - Matter $\bar{\mathbf{B}}$, as Real $\equiv$ Space $\equiv$ Atoms and, Imaginary $\equiv \{E \Rightarrow M - \text{Wave}\}$.
5. The DUAL-Refracton of Energy as Real $\equiv$ The Space angle φ , Imaginary $\equiv \bar{\mathbf{v}}_1, \bar{\mathbf{v}}_2 \{ \text{The Energy} \equiv W \text{ from the different velocities, } \bar{\mathbf{v}}_1, \bar{\mathbf{v}}_2 \}$.

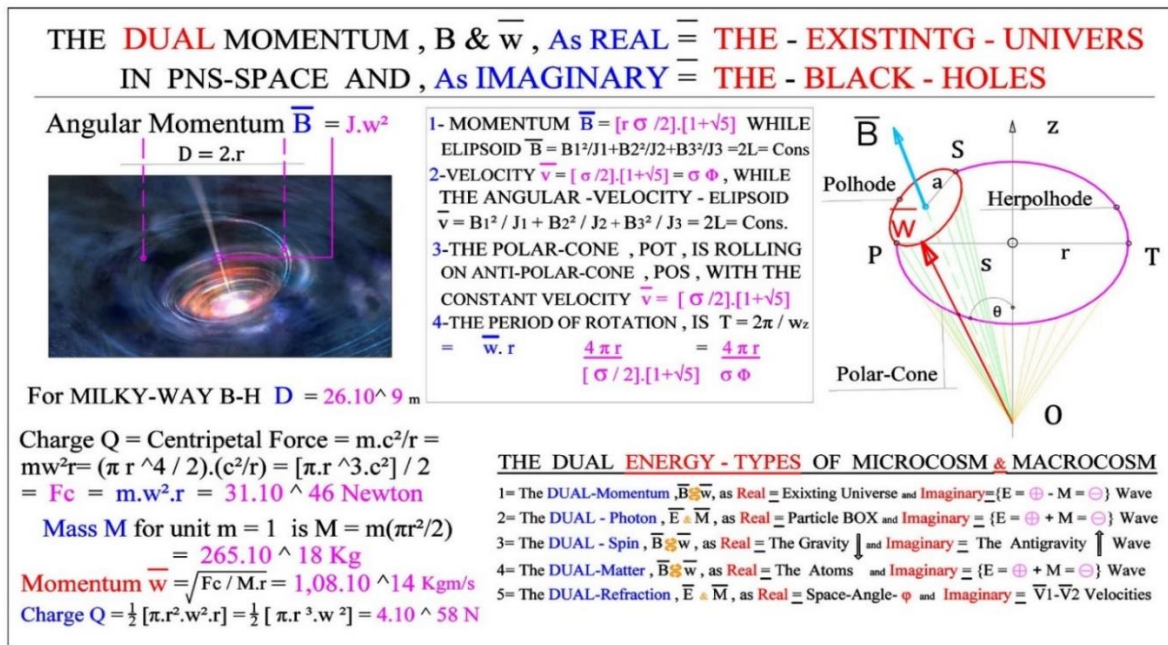


Figure 17: The Energy in Orbits and the Conditions for Black-Hole $[\bar{\mathbf{v}} = n\pi c = \lambda \cdot n\pi f]$

In [MFMF]Space, Work = motion = Energy is zero as $W = \int_B^A P \cdot ds = 0$, and this because $ds = \vec{v} = 0$ and Time is not existing and $\vec{v} = 0$ as relation, $s = \vec{v} \cdot T$. Each Unit $\overrightarrow{AB} = ds > 0$ 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 Universe and that of Spaces exists because of this Static Inner Impulse, on the contrary should be one Point only or, Primary Point A = Black Hole $\rightarrow ds = 0$ and $P = \infty$. Since Impulse is ∞ , then it may be $\rightarrow$ Vacuum, Momentum or Potential or Induced Potential and it is a Type of Effect, to Push the nature $\rightarrow$ (Impulse $\equiv$ Motion $\equiv$ Energy) $\leftarrow$

In [PNS]Space, Energy $\equiv$ Work is either momentum (mv), or Rotational Momentum as ($\Lambda = r \cdot mv$). Velocity $\dot{x}$, in form $\dot{x} = w A \cos(w t - \theta) = \pm w A \cdot [\sqrt{1 - \sin^2(wt - \theta)}] = \pm w \cdot [\sqrt{A^2 - x^2}]$ where momentum relation $\vec{B} = m r v = m r^2 w = m r^2 (2\pi f) = \frac{J \cdot w}{2} = [\frac{\pi r^4}{4}] \cdot [2\pi f] = \frac{\pi^2 r^4 f}{2}$, and Mass of Elementary-Particles is $m = \frac{\pi^2 r^4 f}{2w \cdot r^2} = \frac{\pi^2 r^3}{2v} f = \frac{\pi^1 r^2}{4}$, or The repeated Quarter circle $[\frac{\pi \cdot r^2}{4}]$ Surface of the $\pm$ Spin Dual Property In Planck's length and area, $A_{QC} = [\frac{\pi \cdot r^2}{4}] = \frac{3,1415926 \cdot (\sqrt[4]{2} \cdot 10^{-35})^2}{4} = 1,1107206 \cdot 10^{-70} \text{ m}^2$. Since issues the monad of mass to be $[\frac{eV}{c^2}] = 1,782662 \cdot 10^{-36} \text{ Kg}$, then Energy Dissipated Per - $A_{QC} = E_{QC} = (1,1107206 \cdot 10^{-70} \text{ m}^2 / 1,782662 \cdot 10^{-36} = 6,230715 \cdot 10^{-35} \text{ Kg}$, Or from the G action Area - Resistance $\equiv$ Gravitational-Impedance Z_{IQC} , exists as $Z_{IQC} = \sqrt{2} c^3 A_{QC} / G$, and $m_{PNS} \equiv Z_{IQC} = \sqrt{2} \cdot c^3 A_{QC} / G = \frac{1,4143 \cdot (27 \cdot 10^{24}) \cdot 1,1107206 \cdot 10^{-70}}{6,680056 \cdot 10^{-11}} = 6,344907 \cdot 10^{-35} \text{ Kg}$. The result agree with Prior because in [PNS]Dipole of Space exists the Impedance Z_{IQC} , which Doesn't exist in [MFMF]Space.

The Primary-Material-Point is Quaternion-type $\rightarrow$ Real and Imaginary $\leftarrow$ as $|\vec{w}| = [s \pm \vec{v} \cdot i]$

- Becomes from [MFMF]-Space, due to the lagging of Velocity $\dot{x}$. The Space $\equiv$ The Real Part is consisted of the two material constituents $[\oplus, r, \ominus]$, while The Energy $\equiv$ Imaginary Part is the In-between them Action (The Rotation of the two constituents which for equilibrium generate the Centripetal and Centrifugal Forces using the inner to light velocity c , into this Sub-Space $\equiv \{[\oplus \leftrightarrow \ominus] \equiv ds \equiv [\oplus \leftarrow ds \rightarrow \ominus]$.
- The Material-Point into [PNS]- Space Possesses the velocity $\dot{x}$ of the Planck's cave Field and exists in Planck's Length $L_p = e^{-i \cdot (\frac{\pi}{2} + 2k\pi) \cdot b} = e \cdot i \cdot (-5\pi/2) \cdot 10 = 8,906 \cdot 10^{-35} \text{ m}$ following Energy-equation $\rightarrow$ Angular-velocity $|\vec{w}| = \frac{d\phi}{dt} = [\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \theta}] \pm [\frac{k_{PNS}}{2 J_1 \cdot \cos \theta}] \cdot i \leftarrow |\vec{w}| = [s] \pm [\vec{D}]$. i.e.

Momentum $\vec{B}$ & $\vec{w}$, as Real $\equiv$ The EXISTING - UNIVERSE as is the Real Objective Reality $|\vec{s}| \equiv$ The Numeric Vector-value of The Material-Point $[\oplus, r, \ominus]$ in [PNS] $\equiv$ The Work stored in POLHODE - CONE of the $|\vec{OS}|$ Rolling Nib -Vector Produced from the Eternal CENTRIPETAL - FORCE, F_c AS THE Newton's ACTION in the Planck's - Cave, AND from the $\vec{B}$ Angular Momentum in the, $+\downarrow \vec{B}$, Direction. The Real Type is applied on all different Monads and their Compounds Monads.

Momentum $\vec{B}$ & $\vec{w}$, as Imaginary $\equiv$ The BLACK - HOLES as is their Real Objective Reality $\pm \vec{D} \cdot i \equiv s \Rightarrow$ The Numeric Amplitude-Vector-value of Material-Point $[\oplus, r, \ominus]$ in [PNS] and The Imaginary

- $\bar{D}.i \equiv$ CENTRIPETAL - FORCE $\mathbf{F}_C \equiv$ The Wave Amplitude -value $\equiv$ The Work stored in the HERPOLHODE CONE of the $|\overline{OB}|$ Rotating $\bar{B}$ -Vector and also Produced from the Eternal CENTRIPETAL - FORCE $\mathbf{F}_C$, AS THE Newton's REACTION into the Planck's - Cave AND from the $\bar{B}$ Angular Momentum in, - $\uparrow \bar{B}$ Direction.

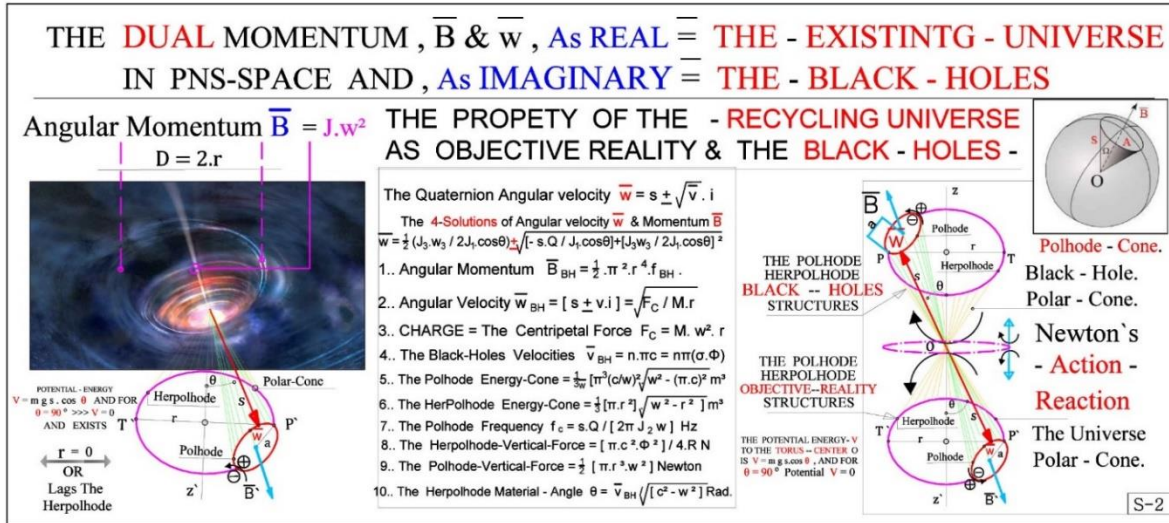


Figure 18: The Momentum $\bar{B}$ & $\bar{w}$ of PNS-Space is DUAL as Universe & Black-Holes.

8e: The DUAL - Photon, as Real $\equiv$ Space $\equiv$ Particle and, Imaginary $\equiv$ $\{E \Rightarrow M - \text{Wave}\}$

The Duality of an Energy-Storage $S \equiv \{[\oplus \leftarrow r \rightarrow \ominus]\} + \text{Motion } M \equiv [\bar{v} - \text{Vector}]$, Therefore $\rightarrow$ Photon is travelling Both as Particle and as Wave, as

- Energy-Storage $S \equiv [\oplus \leftarrow r \rightarrow \ominus] \equiv \text{Particle } [\bar{v}, \bar{f}_n] \rightarrow [\bar{v} = \bar{c} = \lambda \frac{f}{\Phi}] \rightarrow$ i.e. a Stationary Standing - Wave $\rightarrow [S \equiv [EM-R \equiv f_{1=N}, f_2, f_3, f_D, f_n = w^2]$.
- Energy-Motion $M \equiv [\bar{v} - \text{Vector}] \equiv \text{The Wave } [\bar{v}, \bar{f}_n] \equiv [f_1 = (E^2 + H^2) = n \frac{(1+\sqrt{5})\sigma}{2\pi r} \frac{\bar{B}}{\pi^2 r^4}] \rightarrow$ i.e. a Propagating Wave as $\rightarrow \{W \equiv EM-R \equiv [\epsilon E^2 + \mu B^2] = 2.\lambda.c.\sin.2\varphi [\varphi = \frac{\bar{B}}{\Phi}]\} \leftarrow$

The moving Storages of Photons and the Stability of Dual-frequency f_{photon} exists because Photon is an Material-Point in cave r , where its Inner is the Stationary-Standing-wave from Electromagnetic-Wave $[E^2 + H^2] = 2(2r).c.\sin 2\varphi$ with n Lobes representing the Normal mode vibration with frequencies $f_n = n.f_1 = \frac{E}{h} = \frac{n.v}{4r} = \frac{n\sigma}{8r} [1 + \sqrt{5}] \equiv \frac{n\sigma\Phi}{2r}$, and its Outward is as an Propagating E-Wave $\rightarrow \{\epsilon E^2 + \mu B^2\} = 2.\lambda.c.\sin.2\varphi \leftarrow$ where Particle $2r = n\lambda$, Cave r , is the Electromagnetic-Energy-Storage and Electromagnetic-Radiation E, B is the Wave conveyer. From Fig-(6) the Light Wavelengths $\rightarrow \lambda_x = \{\frac{c^2}{g}\}.\sin(\pi - 2\varphi) \perp \lambda_y = \{\frac{c^2}{g}\}.\sin(\frac{\pi}{2} - \varphi) \leftarrow$ where, Real-Part is the Trigonometry-Plan relation $\sin(2\varphi) = \sin(\pi - 2\varphi) = \sin(\frac{\pi}{2} - \varphi)$ as length, and Imaginary-Part is the Gravitational Force G acting on g as $E_x = E_y$.

3: The DUAL - Spin $\bar{B}$, as Real $\equiv$ Space $\equiv$ Gravity and, Imaginary $\equiv$ $\{\text{Anti - Gravity}\}$

The Light velocity vector $\bar{c} = 2,9979.10^8$ m/s Rotates In the Planck's length of Perimeter $r_p = 1,616255.10^{-35}$ m, and is thrustured through the only one Newton's Gravitational Force $\bar{G}$, During

Rotation is created Work which is stored in the circle Surface as Angular - Momentum $\bar{\mathbf{B}} = \mathbf{r} \, m \, \mathbf{v} = \frac{\mathbf{J} \cdot \mathbf{w}}{2} = \left[\frac{\pi \cdot \mathbf{r}^4}{4} \right]_{\mathbf{r}} \frac{\mathbf{c}}{\mathbf{r}} = \left[\frac{\pi \cdot \mathbf{r}^3}{4} \right] \cdot \bar{\mathbf{c}} = \left[\frac{\pi \cdot \mathbf{r}^2}{4} \right] \cdot \bar{\mathbf{c}} \times \bar{\mathbf{r}}$, in Semi circle $\{+[4 \ -1 \ -3]\}$, and Semi circle $\{-[4 \ -2 \ -3]\}$, for the Stability of Equilibrium. i.e. From circle $[1 \ -4 \ -2 \ -3]$, Gravity + $\mathbf{g} \equiv$ The Vector of Angular-Momentum $\bar{\mathbf{B}} \equiv + \text{Spin} \equiv \downarrow \cup \equiv$ The Work stored in the $[4 \ -1 \ -3]$ Semi circle of the, $\bar{\mathbf{r}} - \bar{\mathbf{c}}$ Vectors circle-Surface, Produced from the Gravitational-Force, $\mathbf{G}$, as ACTING into the -Planck- Cave, AND on the light Velocity Vector of, $+\downarrow \bar{\mathbf{c}}$ Direction. The Real Type is applied on all different Monads and their Compounds Monads.

Antigravity - $\mathbf{g} \equiv$ The Vector of Angular -Momentum $\bar{\mathbf{B}} \equiv - \text{Spin} \equiv \uparrow \cup \equiv$ The Work stored in the complementary $[4 \ -2 \ -3]$ Semi circle of the, $\bar{\mathbf{r}} - \bar{\mathbf{c}}$ Vectors circle-Surface which is Produced from the Gravitational-Force, $\mathbf{G}$, as ACTING into the - Planck- Cave, AND on the light Velocity Vector of The, $-\uparrow \bar{\mathbf{c}}$ Direction.

4: The DUAL - Matter $\bar{\mathbf{B}}$, as Real $\equiv$ Space $\equiv$ Atoms and, Imaginary $\equiv \{\mathbf{E} \Rightarrow \mathbf{M} \text{ -Wave}\}$

In Mechanics, the Kinetic Energy is equal to Potential $E_K = E_P$, and Total Energy $E_T = 2.E_K = 2.E_P$ or $\rightarrow \frac{1}{2} m \, v_i^2 = \frac{1}{2} k \, d = \frac{1}{2} m \, (w \, r_i)^2$, and for stability issues, $k \, d = m \, w^2 \cdot d^2$, or $w^2 = \frac{k}{m} \left[\frac{1}{d} \right]$, or $\bar{\mathbf{w}} = \sqrt{\frac{k}{m} \left[\frac{1}{d} \right]} = 2\pi \cdot f$, and $f = \frac{1}{2\pi} \sqrt{\frac{k}{m \, d}}$. From Energy equation $E = h \, f = \frac{h}{2\pi} \sqrt{\frac{k}{m}} = \frac{6,6260696 \cdot 10^{-34}}{2 \, \pi} \sqrt{\frac{k}{m \cdot d}} = 1,054572 \cdot 10^{-34} \sqrt{\frac{k}{m \cdot d}} \cdot J = 1,0545717 \cdot 10^{-34} \sqrt{\frac{k}{m \cdot d}} / 1,6022 \cdot 10^{-19} \, \text{eV} = 6,582022 \cdot 10^{-16} \sqrt{\frac{k}{m \cdot d}} \cdot \text{eV} = E_K + E_P$, i.e. In Mechanics, The equality of the Two Opposite-quantities $E_K = E_P$, is conserved in a common loop as $\rightarrow \sqrt{\frac{k}{m \cdot d}} \, \text{eV} \leftarrow$ meaning that when two Photons strike each other then the Produced Work is kept in the cave, r , as fundamental frequency $\mathbf{f}_1 = n \frac{\sigma \Phi}{2\pi r}$, and which is equal to The Eigenvalues and Eigenvectors of the Photons-Heap where $E_K + E_P = 0$ or issues $E_K = -E_P$, and is $\rightarrow E_K =$ The Matter, $E_P =$ The Anti-Matter. [39-48-57-61] Above Procedure and because of their common Inertia of Atoms-masses alllows us to accept the angular- velocities of each Atom separately, and be its Identity.

When the Quanta of Energy Rotate in a cave and exists, Maxwell's Electric Displacement current the Stability of $\{\oplus \text{ -Space} \equiv \text{Matter} \equiv [\text{Electric Wave}], \{\ominus \text{ -Anti-Space} \equiv \text{Anti-Matter} \equiv [\text{Magnetic Wave}]\}$ Exists In the Sub-Space $\equiv [A_E, B_E, C_E]$ in circle $\{[\oplus \leftrightarrow \ominus] \equiv ds \equiv [\oplus \leftarrow ds \rightarrow \ominus] -$ or - In the The Neutral-Space $\emptyset \equiv [\oplus \cup \cup \ominus] \equiv [\text{MFMF}]$. The Superflow of Energy stills in Sub-Spaces as Solution-4 and finally Ends up, in Black-Holes:

Amplifiers and Tapered Wave-Amplitudes:

The Integer number n in common loop $f_{\text{loop}} = \sqrt{\frac{n \cdot k}{m \cdot d}}$ is the amplifier of the frequency in loop In where the Intensity is $I_{\text{loop}} = \rightarrow \mathbf{E}_o^2 \cdot \cos^2 \left[\frac{\pi \Delta}{\lambda} \right]$

Amplifiers of Energy in PNS-Space is the Solution-3 $\Rightarrow |w_3| = [s] + [\sqrt{\bar{\mathbf{D}}}]$, i, of Angular Momentum $\bar{\mathbf{w}}$ & $\bar{\mathbf{B}}$ Mechanism which is the Polhode-Cone, [Fig-18] becoming from $\rightarrow$ the Space-Inertial-Ellipsoid of $\bar{\mathbf{w}}$, and from the Energy-Inertial-Ellipsoid of $\bar{\mathbf{B}}$, on $J_3 = J_s$ axis $\leftarrow$ Angular-

velocity-Cone $|\bar{W}| = \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} \pm \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} = s \pm \{\sqrt{\bar{D}}\} \cdot i$ where Real $\Rightarrow s = \left[\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right]$,
 Imaginary $\Rightarrow \bar{D} = \left[\frac{k_{PNS}}{2 J_1 \cdot \cos \vartheta}\right]$, $k_{PNS} = \sqrt{[J_3 \cdot w_3]^2 - 4 \cdot sQ \cdot J_1 \cos \vartheta}$ Energy $\sqrt{\bar{D}} = 0$ when $4 \cdot sQ (J_1 \cos \vartheta) = J_3^2 w_3^2$, or $[J_3 w_3]^2 = 4 \cdot sQ (J_1 \cos \vartheta) \equiv \bar{B} \cdot \bar{W} = 2L$

5. The DUAL-Refraction of Energy as Real $\equiv$ The Space angle φ , Imaginary $\equiv \bar{v}_1, \bar{v}_2$ {The Energy $\equiv W$ from the different velocities, $\bar{v}_1, \bar{v}_2$ }. Refraction in Physics is the change of direction of a Wave passing from one medium-1 to another medium-2, caused by its change in speed. The change of direction denotes Work Produced and since issues the Ratio $\frac{\text{velocity } v_1}{\text{velocity } v_2} = \frac{\cos \varphi_1}{\cos \varphi_2} = \text{constant}$, then this means that it is the Energy-Part of the Phenomenon. Since also the Incident-ray from φ_1 angle and the Refracted-ray of φ_2 angle occupy the constant Ratio $\frac{\sin \varphi_1}{\sin \varphi_2} = \text{constant}$, then this is the Space - Part of the Phenomenon. i.e. The Energy-Refraction is Real as Space angles φ , and Imaginary as the two different velocities $\bar{v}_1, \bar{v}_2$.

9e: The Energy in Orbits and the Conditions for Black-Hole [72-73]

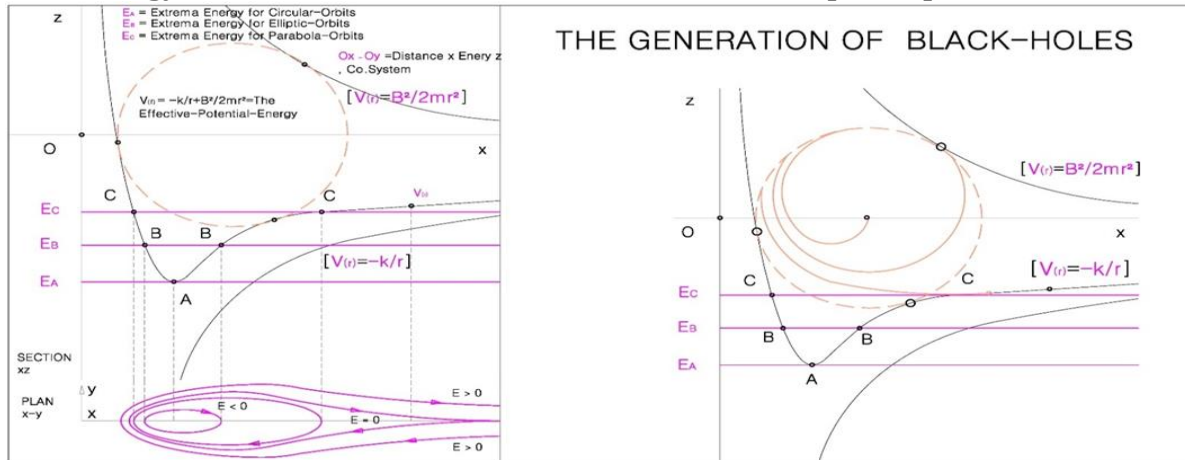


Figure 19: The Energy in Orbits and the Conditions for Black-Hole $[\bar{v} = n\pi\bar{c} = \lambda \cdot n\pi f]$

In (1) is the Graph of Effective-Potential-Energy-Orbits in a Central-motion becoming from Kepler constant $k = 4\pi^2 \cdot r^3 \cdot f_p^2$, or $1 = \left[\frac{4\pi^2}{k}\right] r^3 \cdot f_p^2 \rightarrow 1 = c \cdot r^3 \cdot f_p^2 \dots (8a)$ where for $r \rightarrow 0$ then $f_p \rightarrow \infty$ ← In Nature is applied in the Black-Holes.

Because of the Golden-ratio-frequency relation $f_n = \left[\frac{(1+\sqrt{5})}{2}\right] \frac{n \cdot \sigma}{2\pi r}$, and from the orbit velocity $\bar{v} = n\pi\bar{c} = \lambda \cdot n\pi f$, then issues $v = \lambda \cdot n\pi \cdot \left[\frac{(1+\sqrt{5})}{2}\right] \frac{n \cdot \sigma}{2\pi r} = \frac{\lambda \cdot n^2 \cdot \sigma}{2r} = n^2 \cdot \sigma$, Predicts the Ubiquity of the Golden-ratio in Nature from the microcosm to macrocosm = the macro scale, and the when velocity $\bar{v}$ can enter the cave r . In Nature is applied in the Suns.

Instead of it, Momentum $\bar{B}$, Rotates Outer the Angular - Velocity - Cone, i.e. From equalities, acceleration $g = \frac{2\pi v}{T}$ and velocity $v = \frac{2\pi r}{T}$ then $g = \frac{4\pi^2 \cdot r}{T^2}$, Period $T = 2\pi \sqrt{\frac{r}{g}}$ or frequency

$\mathbf{f}_1 = \sqrt{\frac{g}{4\pi^2 r^3}}$ (8b) or from acceleration on orbits $a = \frac{2\pi v}{T} = \frac{v}{r} v = \frac{v^2}{r}$ and from force $P = m \frac{d\bar{v}}{dt} = \frac{d(m\bar{v})}{dt} = m \cdot \bar{a}$. From constant $C r^3 \cdot \mathbf{f}_p^2 = 1$, when cave r , tends to zero then frequency $\mathbf{f}_1$ is tending to infinite ∞ , and constant $C = \frac{4\pi^2}{GM_S} = 5,9188 \cdot 10^{11} \text{ Kg}^2/\text{Nm}^2 M_S$. while in Photon exists an Angular-Momentum $\mathbf{B}_{PH}$ rotating Auter Angular-velocity-Cone as Stationary wave $[\mathbf{B}_P \equiv \mathbf{f}_{1=N}, \mathbf{f}_2, \mathbf{f}_3, \mathbf{f}_R] \equiv [E^2 + H^2] = 2(2r) \cdot \bar{c} \cdot \sin 2\varphi = 2(2r) \cdot \bar{c} \cdot \sin[\pi - 2\varphi]$ --(8c) meaning that, Black-Hole in Photon is Not Possible.

It was shown that Photons Dual-frequency $\mathbf{f}_{\text{photon}}$ exists because Photon is an Material-Point in cave r , where its Inner - Part is the cave r as the Stationary-Standing-wave of the Electromagnetic-Wave $[E^2 + H^2] = 2(2r) \cdot \bar{c} \cdot \sin 2\varphi$ with n Lobes representing the Normal mode vibration with frequencies $f_n = n \cdot f_1 = \frac{E}{h} = \frac{n \cdot v}{4r} = \frac{n\sigma}{8r} [1 + \sqrt{5}] \equiv \frac{n\sigma\Phi}{2r}$, and its Outward-Part is Propagating E-Wave $\rightarrow \{[\epsilon E^2 + \mu B^2] = 2 \cdot \lambda \cdot \bar{c} \cdot \sin 2\varphi\} \leftarrow$ where Particle $2r = n \lambda$, Cave r , the Electromagnetic-Energy-Storage and Electromagnetic-Radiation E, B is the Wave conveyer.

Which are the Propositions for Planar and Atoms - Black - Holes?

From (8a), (8b) and $\mathbf{f}_1$ when cave - r , tends to zero, 0, then frequency $\mathbf{f}_1$, is tending to infinite ∞ , while from (8c) is the opposite, and when $\mathbf{f}_1$ tends to ∞ then, r tends to zero i.e. Both are the cases of an Planar $[\rightarrow r \rightarrow 0 \text{ then } \mathbf{f}_p \rightarrow \infty \leftarrow]$ and for an Atom - Black - Hole, $[\rightarrow \mathbf{f}_p \rightarrow 0 \text{ then } r \rightarrow \infty \leftarrow]$ Since Photon is a Material Point then is of Quaternion-type $\rightarrow$ Real and Imaginary $\leftarrow$ as $|\bar{w}| = [s \pm \bar{D} \cdot i]$, meaning s = The Particle and $\pm \bar{D} \cdot i$ = The Energy. The How and When a Black-hole is formulated in caves [73].

The Work in $n = 1$ loop is $W = [\frac{4\pi r^2}{2}] \cdot \mathbf{f}_1 = [\frac{4\pi r^2}{2}] \cdot \frac{(1 + \sqrt{5}) \cdot \sigma}{2\pi r} = \frac{r \cdot \sigma \Phi}{2}$, which is dependent on the cave, r , only and Glue-Bond σ , and for $n = n$ loops $\rightarrow W = [\frac{r \cdot \sigma \Phi}{2}] \cdot n \dots (w)$

Above equation defines the HOW, conservation law of Energy in Photon is working, and it is an Index for Future Energy-Sources-Technology attempt. It was Proved that Energy of wave is $\rightarrow E = m \cdot \dot{y}^2 / 2 = (m/2) \cdot (-w)^2 \cdot A_0$, and $m = \frac{2 \cdot E}{r^2 \cdot w^2}$ i.e. Mass of cave r , is $\rightarrow m = \frac{2 \cdot E}{r^2 \cdot w^2} = \frac{2 \cdot \bar{B}}{r^2 \cdot w^2} = \frac{W}{r^2 \cdot w^2} = \frac{r \cdot \sigma \Phi}{2 \cdot r^2 \cdot w^2} = \frac{\sigma \Phi}{2 \cdot r w^2} = [\frac{\pi r^2}{c^2}] \cdot \mathbf{f}_1 \dots (p)$

Since mass is equal to $m = \frac{2}{c^2} (w r)^2 = \frac{2h \cdot f}{c^2} = \frac{h \cdot w}{2\pi \cdot c^2} = \frac{2 \cdot E}{r^2 \cdot w^2}$, i.e. analogous to Energy w only where then, mass is a factor measuring this Energy magnitude only, The Hydrogen min-frequency from the light velocity $\bar{c} = 2\pi r \cdot f$ and $\mathbf{f}_{PH} = \frac{E=14,6 \text{ eV}}{h=6,62607 \cdot 10^{-34}} = 3,53 \cdot 10^{15} \text{ Hz}$, in $r = 13,52 \cdot 10^{-9} \text{ m}$ and Photon max. mass $m_{PH} = 2\pi \cdot r^2 \cdot [\frac{2\pi r f}{\Phi}] = [\frac{4\pi^2 r^3}{\Phi}] \cdot \mathbf{f}_p = 21,03 \cdot 10^{-8} \text{ Kg}$. All these from Kepler constant relations $\bar{c} = 2\pi r \cdot f$ and $g r^3 \cdot \mathbf{f}_p^2 = 1$ i.e. H-Photon has a frequency $\mathbf{f}_{PH} = 3,53 \cdot 10^{15} \text{ Hz}$ and mass $m_{PH} = 21,03 \cdot 10^{-8} \text{ Kg}$.

In a few words Energy $\equiv$ Motion $\equiv$ is Quantized in constant-Quantity in Energy-lobes as the loops, and Exists because of Opposition of Charge. It is trapped in Energy-caves in case of

Circular-motion $\equiv$ {Stationary Waves $\equiv$ The monads}, and Is getting Out the cave in case of the Skin-effect $\equiv$ {Formulated in the three Moulds of $\rightarrow$ [Space - Anti space - Kinetic Energy]}, Never vanishes But continuously changes to above three Moulds, $\emptyset \equiv [\oplus \cup \cup \ominus] \equiv$ [MFMF], Fig-12, formulating the Primary and Compound elements of this cosmos.

How and Why exist the Black-holes?

- a. Two Physical-Systems are in Thermal-Equilibrium if there is no net flow of Thermal-Energy between them, when they are connected by a Path Permeable to Heat. Thermal equilibrium obeys the zeroth law of Thermodynamics, where the temperature within the System is, Flowing Spatially and Temporally Uniform.
- b. Two Physical - Systems are in Mechanical-Equilibrium, and it is the condition of the Systems when neither their State of motion nor their Internal Energy - State tends to change with time and motion. Equilibrium is so established and if the Gradient of the Potential-Energy with respect to the generalized coordinates is zero then $\rightarrow$
- c. The two existing Physical-Systems, that of Gravity-force ∇i , and that of all others $\{[\nabla i].[\pm \bar{v}.s^2]\}$, is the condition of the two Systems, either Stationary or in motion, to react continuously either Internal or external and their State of motion either the Internal Energy-State or their External Energy-State, which tends to change between them, to be connected by a Path Permeable to a common motion.

All stars are under the pressure of Gravity. This force is created from the continuous internal acceleration $a = v^2/r$ of Material-points $[\oplus s^2 \cup \cup \ominus s^2]$ in MFMF Gravity-field. The continuous Pressure between them reach a Point that they cannot be compressed any further, and so the electrons degenerate the Pressure on a Neutron Star-breaks-down under the force of Gravity and then, Black holes are created. In this way a NEW System just the opposite to [STPL] is generated and all {Regular Matter and Antimatter, Dark Matter, Energy, Degenerate this matter, Stationary and travelling Gravity-force} are annihilated following, The Permeable Resonance - Path of Gravity-Material-Point from the eternal motion of the Opposites.

- d. Following Kepler laws then, On any moving Particle when is Tangentially-colliding or is under any angle ϕ with a Material-Point executing Circular motion then the Total Energy E is Negative, and the Particle follows constant Elliptical-Energy-Orbits on the same semi major axis as, $k = 1/c = f_n^2 \cdot a^3$, and of the same constant Energy. Semi major axis a , is related to energy as $\rightarrow a = G \cdot Mm / 2E$, i.e. for very large Energies, semi major axis tends to a Negative-Energy-Point which is the beginning of the Black hole in microcosm and macrocosm. For axis $a \rightarrow 0$, then $f_n \rightarrow \infty$, i.e. for very small semi major axis a , the frequency becomes infinite and Infinite-Negative-Energy also, which is the Black-hole. or For Energy $E \rightarrow \infty$, the frequency becomes Infinite-Negative Energy also and then axis $a \rightarrow 0$, i.e. it is the Black-hole. Resonance-Path happens as the Force, EM-Radiation in Two directions, can travel in any closed System 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 System, and change the Inner-Structure of the System to another Primary-Energy-System. From Inner-velocity equation $\rightarrow v = w r = (2\pi/T)r = 2\pi \cdot f_1 \cdot r$, wavelength $\lambda = cT = c / f_1$, cave $r = n \cdot [\lambda/2]$ and $\rightarrow r = n \cdot (c / 2f_1)$ also $v = 2\pi \cdot f_1 [n \cdot c / 2f_1] = n \cdot \pi \cdot c$ or $\rightarrow v = n \cdot \pi \cdot c \leftarrow$ and thus showing, velocities in lobes are, $n \cdot \pi$ times that of light, and for $n = 1$ then $v = \pi \cdot c$ i.e. more than 3 times the light velocity. In Nature such velocities are applied in the Suns and in the Black-Holes. The answer to the question < Why is the speed of light constant and

magnitude c ? and not, it just does, is because as prior referred, the Centrifugal velocity, $\bar{v} = \bar{w}.r$, is always the constant $\bar{c}$, and this because acceleration $[d\bar{v}/dt = d(\bar{w}r/dt) = 0]$ is zero and since $\bar{w}$ is a constant. [39]. In Chemical reactions, in order to take Place a Resonance-Path between an Energy-Storage and a Particle, is that the Reactants must collide, $[\oplus s^2 \leftrightarrow \ominus s^2]$, which need enough Kinetic-Energy, while in Sub atomic and Crystal region motion can happen through Propagation and energy as EM-Radiation which exists in waves.

- e. From relation $\rightarrow G = k_E g = g. k_L g_L \leftarrow$ The Gravitational Constant and coefficients.
 $G \equiv$ The Pulling and simultaneously Cohesive Bond on all Quantized - Energy Structures either in or Outer Planck's cave P_{PC} , following the first Newton's law.
 $f_n \equiv$ The Amount of motion-meter in the Augmented-Golden-Pattern Φ .
 $k_E = [1/g] =$ Earth-Unit-coefficient = constant monad.
 $g_L \equiv g k = g. [Force/Area] = G =$ The Local Uniform-Pressures.
 For all Planes issues $G = k_E g = g. k_L g_L$, and for Black-holes where $G = g. k_{BH} . g_{BH} = 9,8076941 * 2,3716.10^{-2} * 2,872.10^{-10} = 6,6805616 * 10^{-11}$, meaning that Gravitational constant G is the Same for all Systems.

Gravity + $g \equiv$ The Vector of Angular-Momentum $\bar{B} \equiv +$ Spin $\equiv \downarrow \cup \equiv$ The Work stored in the [4-1-3] Semi circle of the, $\bar{r} - \bar{c}$ Vectors circle-Surface, Produced from the Gravitational-Force, G , as ACTING into the -Planck- Cave, AND on the light Velocity Vector of, + $\downarrow \bar{c}$ Direction.

IS $\rightarrow$ The minimum Granular-Quantized-Energy, $\bar{B}$, from the Gravitational Force G , when is acting into The -Planck- Cave, and represents the Basic Acting Quantum-Raw-material, for All the Energy structures.

Antigravity - $g \equiv$ The Vector of Angular -Momentum $\bar{B} \equiv -$ Spin $\equiv \uparrow \cup \equiv$ The Work stored in the complementary [4-2-3] Semi circle of the, $\bar{r} - \bar{c}$ Vectors circle-Surface which is Produced from the Gravitational-Force, G , as ACTING into the - Planck- Cave, AND on the light Velocity Vector of The, - $\uparrow \bar{c}$ Direction.

IS $\rightarrow$ The minimum Granular-Quantized-Energy - $\bar{B}$, from the Gravitational Force G , when is acting into The -Planck- Cave, and represents the Basic Equilibrium Quantum-Raw-material, for All the Universe-Energy-Structures. The Linear and Rotational motion in all displacements r : [77]

The Minimum-Work $\rightarrow W = 4\pi^2 \frac{r^3}{T^2} . \bar{n} = 4\pi^2 . r^3 . f_p^2 . \bar{n} \leftarrow$ in an Negative-Elliptic-Energy-field-Disk as this is PNS, which is stored as a Voltage $[N \equiv \oplus \leftrightarrow \ominus \equiv P]$ across the Disk between the rotating Planet P , and Nucleus N , Produced from the Pressure, σ , of the frequency f_p and of the semi-major axis a_p of the Planet.

Motion is Kept, is quantized as Unit-work $W = 1 = k \equiv [\nabla i]$. $[\pm s^2] \equiv [MFMF]$ Field, In the Orbit-area, πab , upon the Spin $\bar{B}$ Orientation of the Pointy-Material-Points $[\pm s^2]$. Orientation of Spin (Angular Momentum) becomes from the Energy in the sinusoidal in orbit gravity-fields, created by the motion of oscillation of the material Points $[\oplus \cup \cup \ominus]$. Any Interaction between this Oriented-Energy Disk-Rim and a Body-Planet creates disturbances in Disk and Reorientation

of Spin $\bar{\mathbf{B}} \equiv \text{motion} \equiv \text{work} \equiv k = \text{constant} = \text{quanta}$ and transformed as, The Gravity-Force in Disk, and which Energy is equal to the Gravity acceleration g , and this because $g = \text{force}$, as equation $g = F/m$. Bodies Produce Gravity {the change of Spin-direction of M-P-Dipole $[\oplus s^2 \cup \ominus s^2]$ in MFMF field} from stationary force $[\nabla i] = \pm s^2$, and because Gravity $\equiv$ acceleration and not change of velocity vector, it is by changing the Direction of the above dipole.

It is later seen that Gravitation as an external force G to masses, is affecting bodies through this Gravity-bedding-Layer, g , created by the velocity of Photon on Bodies.

It was shown before that, since Motion presupposes velocity vector $\bar{\mathbf{v}}$ which, when it is in motion collides with other velocity vectors and creates Constant work, k , and then Motion may be Linear or Rotational for any displacement, r , where then is created the Constant-Work $\Rightarrow W = k = \bar{\mathbf{v}} \times \bar{\mathbf{v}} \cdot \bar{\mathbf{r}} = v^2 \cdot r \cdot \bar{\mathbf{n}} \dots (a)$ i.e. Constant-Work $= k = v^2 \cdot r = (wr)^2 \cdot r = [\frac{2\pi}{T}]^2 \cdot r = \frac{4\pi^2 r^2}{T^2} \cdot r = \frac{4\pi^2 r^3}{T^2} = 4\pi^2 \cdot \frac{r^3}{T^2} = 4\pi^2 \cdot r^3 \cdot f_p^2$

Because Gravity-Force F_G becomes from the in-storages acceleration $a = v^2/r$ of the infinite-material-Points in MFMF field, and force $[\nabla i]$ is stationary because from the Pointy Rotation $[-s^2 \cup \oplus s^2]$ of MP-Spin, then for Planck length issues Gravity force $[\nabla i] \equiv F_G \equiv m_G g = g \cdot \nabla [\frac{\sigma}{c^2}]^2 \cdot r = m_G \frac{v^2}{r} = Jw^2 \cdot g_G = [\frac{\pi r^4}{2}] w^2 \cdot \frac{v^2}{r} = \frac{v^2}{r} [\frac{\pi r^4}{2}] \frac{v^2}{r^2} = [\frac{\pi r v^4}{2}] \dots (b)$ and from relation, Spin $S = \bar{\mathbf{B}} = \frac{h\sqrt{3}}{4\pi}$ then, Gravity-force $\rightarrow F_G \equiv [\frac{\pi v^4}{2}] \frac{n\pi}{2h(1+\sqrt{5})} \bar{\mathbf{B}} = [\frac{n\pi^2}{4h(1+\sqrt{5})}] \bar{\mathbf{B}} v^4 = [\frac{n\pi^2}{8h\Phi}] \bar{\mathbf{B}} v^4$, and so $F_G \equiv \frac{n\pi\sqrt{3}}{16(1+\sqrt{5})} v^4 = \frac{n\sqrt{3}\pi}{2\Phi} (\frac{v}{2})^4$, which is the Black-hole-gravity-equation and, is related to the Inner velocity v , and to its n lobes.

Gravity-Acceleration is $g_G = s[\frac{\pi r v^4}{2}] = [\frac{3,1415926([\sqrt{5}+1] \cdot \sqrt[4]{2} \cdot 10^{-35}) \cdot (299793458)^4}{2}] \cdot e^3 = 6,044981 \cdot 10^{-35} \cdot 80,776078 \cdot 10^{32} \cdot 20,085536 = g_G = 9,8075633 \dots (c)$, where $1/m_G = s = \text{mass-coefficient} [\sqrt{5}+1] \cdot \sqrt[4]{2} \cdot e^3$, because the constant Tensor T_z is the length of the vector, $z \equiv m$, in Euclidean coordinates and which magnitude is $k = T_z = \sqrt{y_1^2 + y_2^2 + y_3^2 + y_n^2}$, denoting the Energy-Space relation.

From above the dimensionless coefficient of work W is $[\sqrt{5}+1]$, which is the Golden Ratio constant for any Material cave, r , a coefficient for the Unity-Plane - Quaternion equal to $\sqrt[2]{\sqrt{2}} = \sqrt[4]{2}$, or the same $\overleftarrow{i \perp j} \equiv \sqrt{2} + k \perp \sqrt{2} \equiv \sqrt[2]{\sqrt{2}} = \sqrt[4]{2}$ and for the Three dimensions Euler Rotation System the number i e. $e = e^3$.

As in Binary system $[1, 0]$, where one kilobyte $= 2.8^3 = 1024$ bytes is eight times than a Kilobit $= 2.4^3 = 128$ bytes $[1\text{byte} = 2^3 = 8 \text{ bits}, 1\text{bit} = a = 1 \text{ or } 0]$ similarly are above dimensions as Units mass.

Bodies Produce Gravity, which is Pressure happening from, the change of the Spins Direction on Stationary M-P-Dipole $[\oplus \leftrightarrow \ominus]$ due from Stationary forces $[\nabla i] = \pm s^2$, as dipole and because of Gravity $\equiv$ acceleration, this happens Not by the change of the velocity vector But, by the changing of Direction of above dipole $[\oplus s^2 \cup \cup \ominus s^2]$.

This Work $\equiv$ Gravity $\equiv$ Energy $\equiv$ a Constant, which becomes from the eternal-motion of Opposites in Material-Point either on the Orbit of any Planet either on the Focus of the Planetary-Systems such in microcosm as in macrocosm in the MFMF field.

The chains of Spin are of Pointy vibrating with their characteristic frequencies $f = \frac{(1+\sqrt{5}) \cdot \sigma}{4\pi r} B = \frac{\phi \cdot \sigma}{2\pi r}$, and since the Inner-stresses $\sigma_{1,2} = \sigma_1/2 \pm (1/2)\sqrt{\sigma_1^2 + 4 \cdot \sigma_1^2} = \sigma_1/2 [1 \pm \sqrt{5}]$ follow the Golden ratio Pattern on Stresses, and then this Quantum-energy g_G produced, is the State causing them to Magnetically- Resonate. In Material-Point-chain of caves $r = \lambda/2$, and since is $\dot{x} = w \cdot r \rightarrow w = \dot{x}/r$ then Golden ratio Damping-Force is the Work produced with Unit Damping-ratio $\zeta = 1$. Since $\dot{x} = v = c$ then exists $\rightarrow F_d = c \cdot \dot{x} = 1m \cdot w_n \cdot \dot{x} = 1 \cdot [(\pi r^2/2) v^2] \cdot \frac{\dot{x}^2}{r} = [\frac{\pi r v^4}{2}] = g = \frac{2}{r} [\sigma (1+\sqrt{5})]^2 = \frac{4\sigma^2}{r} [3+\sqrt{5}]$.

This dissipation of Energy is determined under conditions of Cyclic Oscillations, and is dependent on Glue-bond σ , and r , cave. Since r , is in denominator then for the very small caves, the under Planck's caves, Damping-Force becomes infinite independently of the Glue-bond. This may be considered as a Type which happens in Black holes and as this happens in algebra inverse fractions also.

F..1)- It was Prior Proved that Angular -Momentum of the Primary-motion in PNS Space is a Quaternion of dimension Power $(s + \bar{v} \nabla i)^{1/d} = \sqrt[d]{(s + \bar{v} \nabla i)}$, which follows that of Spaces Origination.

2)- It was Prior Proved that in PNS - Space the inner Forces of a System, are the two equilibrium Centripetal and Centrifugal Forces due to the Eternal, $\pm \sigma$, Stresses of Opposites $[\oplus \leftrightarrow \ominus]$ Originate motion u , as $J_1 \cdot u^2 \cos \vartheta - J_3 w_3 \cdot u + s \cdot Q = 0$.

This Quadratic equation has 4 Solutions where the Angular velocity Complex number $u = |\bar{w}| = \frac{s \cdot Q}{J_3 w} = \frac{s \cdot Q}{J_3 w} = |\bar{w}| = \frac{d\varphi}{dt} = [\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}] \pm [\frac{k_{PNS}}{2 J_1 \cdot \cos \vartheta}] \cdot i = s \pm v i$, or $\rightarrow$ Angular-velocity $|\bar{w}| = \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} \pm \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + (\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta})^2} = s \pm \{\sqrt{\bar{D}}\} \cdot i \leftarrow$ where $s = [\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}]$, $\bar{D} = [\frac{k_{PNS}}{2 J_1 \cdot \cos \vartheta}]$, $k_{PNS} = \sqrt{[J_3 \cdot w_3]^2 - 4 \cdot sQ \cdot J_1 \cos \vartheta}$

The constant Work was found $\bar{B} \cdot \bar{w} = 2L = J \cdot w^2$, and The frequency-monad of rotation in PNS Space to be $\rightarrow f_{PNS} = \frac{s \cdot Q}{2\pi J_2 \cdot w} \leftarrow$ with the following 4 - Solutions for $|\bar{w}|$.

Solution-1 $\Rightarrow |w_1| = [s] + [\sqrt{\bar{D}}] \rightarrow$ Real Root $\equiv$ Huge Minerals at Edge of Universe.

Solution-2 $\Rightarrow |w_2| = [s] - [\sqrt{\bar{D}}] \rightarrow$ Real Root $\equiv$ Atoms & Compounds into Structures.

Solution-3 $\Rightarrow |w_3| = [s] + [\sqrt{D}] \cdot i \rightarrow$ Imaginary Root $\equiv$ Huge BH at centres of Galaxies.

Solution-4 $\Rightarrow |w_4| = [s] - [\sqrt{D}] \cdot i \rightarrow$ Imaginary Root $\equiv$ Micro BH at centre of Molecules.

From 4-above issues:

$$\text{A-Velocity } |\overline{w_1}| = \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} \pm \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} \equiv \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} + \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2}$$

$$\text{A-Velocity } |\overline{w_2}| = \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} \pm \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} \equiv \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} - \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2}$$

$$\text{A-Velocity } |\overline{w_3}| = \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} \pm \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} \equiv \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} + \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} \cdot i$$

$$\text{A-Velocity } |\overline{w_4}| = \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} \pm \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} \equiv \frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta} - \sqrt{-\frac{sQ}{J_1 \cdot \cos \vartheta} + \left(\frac{J_3 \cdot w_3}{2 J_1 \cdot \cos \vartheta}\right)^2} \cdot i$$

Angular-velocity $\overline{w}$ is a vector, and Rotates in one axis k with respect to variable $\overline{B}$ Momentum and, the Ellipsoid of $|\overline{w}| \equiv$ Quaternion of dimension Power $(s \pm \overline{v} \nabla i)^1/d$. The Inertia J -Ellipsoid of $|\overline{w}|$ gives two Anti-Symmetrical Inertial Ellipsoids, a Real and an Imaginary in their Polhode and Herpolhode Cones as below,

$\Rightarrow$ The-Real $\overline{w} \equiv \{\text{Polhode} \equiv \text{Cone OPS, Herpolhode} \equiv \text{Cone OPT, } [\cup \text{ Rolling}] \text{ on the Ellipsoid axis, } \downarrow \text{ Normal ON the Unmovable \& Attitude-Plane of the [PSPT] Truncated-Polar-Cone}\}.$

$\Rightarrow$ The-Imaginary $\overline{w} \equiv \{\text{Polhode} = \text{Cone OPS, Herpolhode} = \text{Cone OPT } [\cup \text{ Rolling}] \text{ on the Anti-Symmetrically-Ellipsoid-axis, } \uparrow \text{ Normal ON the Unmovable \& Attitude-Plane of the [PSPT] Truncated-Polar-Cone}\}.$ It has been Proved that $\overline{B}$, $\overline{w}$ Vectors exist as, $E = \text{Energy} = \text{motion}$, $S = \text{Space} = \text{Length}$

Both magnitudes define the Unit-Energy Vectors $\rightarrow \{\text{Unit-E Vector } R = \frac{\sigma}{J \cdot w^2} = \frac{\sigma}{B}\} \leftarrow$ When the Unit-E.Vector R is Placed ON $[AB \equiv 2R \text{ S.Diameter of Spaces-Neutral-circle}]$ Then Energy-Monad $|\overline{R}|$, exists on, Space-Monad $|AB| \equiv |\overline{R}|$ and $\{E+S \text{ -Monad } |\overline{R}|\}$, i.e. $\{\text{Energy - Space - Monad } |\overline{R}| \equiv |AB|\}$, where the magnitudes, Spaces Sides $\lambda_n = 2 \cdot \sqrt{R^2 - a_n^2}$, &, Quantum Critical-Side $a_n = \frac{1}{2} \sqrt{4R^2 - \lambda_n^2}$, Every=Monad occupies $AB = 2|R|$ Diameter = Space & Unit-E-Vector $R = \frac{\sigma}{J \cdot w^2} = \frac{\sigma}{B} =$ motion The Quantization of Energy in Spaces happens by following the Archimedes formula for Duplication of Sides as $\lambda_{2n} = \sqrt{2R^2 - R \sqrt{4R^2 - \lambda_n^2}}$ & Critical-Sides $a_{2n} = \frac{1}{2} \sqrt{4R^2 - \lambda_{2n}^2}$ The Energy-Monad $|\overline{R}| = \frac{\sigma}{J \cdot w^2} = \frac{\sigma}{B}$ remains the same in PNS - Space while The Spaces Sides change as λ_{2n} , a_{2n} , when the Monad $|\overline{R}|$ enters the $2n$.

The $|\overline{w_1}|$ Solution is the Real -Root giving the Strongest in Amplitude Energy-Structions.

The $|\overline{w_2}|$ Solution is the Real -Root giving the Weakest in Amplitude Energy-Structions.

The $|\overline{w_3}|$ Solution is the Imaginary-Root giving the Mega Tapered-Amplitude E-Structions.

The $|\overline{w_4}|$ Solution is the Imaginary-Root giving the Micro Black-Holes Structions.

Remarks:

- The HOW Black-Holes Structures occur, is the When the Unit-Energy-Vector R IS Placed ON the $[AB \equiv 2R \text{ Space - Diameter of the Spaces - Neutral - circle}]$.
- The WHEN Black-Holes Structures occur is, The When the Quantization of Energy in Spaces follows the Archimedes formula for Duplication of Sides where the Space Monad is Halve of Prior and Energy Monad Equal to the Unit-Energy-Vector R.
- In Mechanics [71] the Permeable- Resonance- Energy Paths On the means IS the Cauchy Rigid-Body Stress -Tensor, while for Elementary-Particles the $J_s = J_{\bar{w}}$ axis Completed with the Space-Monad $|\bar{R}| \equiv |AB|$ & The Energy-Monad $|\bar{R}| \equiv \frac{\sigma}{J_{\bar{w}^2}} = \frac{\sigma}{\bar{B}}$. where For $|\bar{w}|$ the Cauchy Ellipsoid-Stress-Tensor IS $\{\bar{w} \perp \bar{B} \perp |\theta \bar{r}| \equiv \sigma_1 \perp \sigma_2 \perp \sigma_3\}$.

From Gravity relation $G = g \mathbf{k}_E = 9,8076941.6,8116.10^{-12} = 6,68056.10^{-11} \text{ m}^3 / \text{N.s}^2$ and from Energy-loop relation $1 = c. r^3. \mathbf{f}_p^2 \rightarrow f_p = \sqrt{1/cr^3}$, from $f = E / h$ then $f = \frac{E}{h} = \sqrt{1/cr^3}$ or $\rightarrow E = h.\sqrt{1/c.r^3}$, and $\frac{E^2}{h^2} = \frac{1}{c.r^3}$ or, $E^2 = \frac{h^2}{c.r^3}$, an Energy relation between the, c, r. This relation is used for Black- Holes Energy where r, result to zero, The Permissible-Permeable-Resonance-Paths for the means are for,

1. Solids → The Normal-mode-Vibration - System $\{-w^2 [M] + [K](X)\} = 0$
2. Liquids → The Cauchy Stress-Tensor as Momentum equation $\{\nabla \cdot \sigma = -\nabla p + \nabla \cdot \tau\}$
3. Gases → The combined Avogadro's Pressure-law $\{PV = n RT = n.mv^2/3\}$
4. Crystals → The Cauchy Ellipsoid-Stress-tensor where $\{E \perp B \perp r \equiv \sigma_1 \perp \sigma_2 \perp \sigma_3\}$
5. Molecules → The Lattice-Crystal-Arrangement with their Chemical Bonds relation
6. Atoms → The Energy-Rims with Chemical Bonds, Ionic, Covalent, relation
7. Particles → The Resultance of the One-Dimensional-Collision $\bar{v}_{ij} = \bar{v}_j - \bar{v}_i = \bar{w}_{ij} \cdot \bar{r}_{ij}$
8. Particles → The Cauchy Ellipsoid-Stress-tensor where $\{\bar{w} \perp \bar{B} \perp \bar{r} \equiv \sigma_1 \perp \sigma_2 \perp \sigma_3\}$
9. M-Points → The Resonance-frequencies $\mathbf{f}_R [S \equiv f_{1=n}, f_2, f_3, f_R = w^2] = \mathbf{f}_n = [\oplus \leftrightarrow \ominus] = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{n.\sigma.\bar{B}}{8 r^2} \rightarrow$ i.e. the Golden-ratio-Pattern, which is related to Spin.
10. Cave-Orbit → The Relation $c. L_s = L_v$, Light-velocity $3.10^8 \text{ m/s} \cdot 1.10^{-42} \text{ m}$ cave $= 3.10^{-34} \text{ m}^2/\text{s}$ are the Cave-Energy-Plane-Rims in Atom's, Planet orbits.

In Vibrations of Systems, for Orbits issues $\rightarrow W = 4\pi^2 \cdot \frac{r^3}{T^2} \cdot \bar{n} = 4\pi^2 \cdot r^3 \cdot \mathbf{f}_p^2 \cdot \bar{n} \leftarrow$ which is the Energy in the Conic-Sections of Kepler's Unit - Orbits.

The Energy-Storages $r = n.[\frac{\lambda}{2}] \equiv W_{n(n+1)} = [\frac{4\pi r^2 f_1}{3}] \cdot n.(n+1)$, are travelling through Bodies and follow Lamé Stress Ellipsoid $n_1^2 + n_2^2 + n_3^2 = \frac{T_1^2}{\sigma_1^2} + \frac{T_2^2}{\sigma_2^2} + \frac{T_3^2}{\sigma_3^2} = 1$ on Principal Stresses $\pm\sigma_1, \pm\sigma_2, \pm\sigma_3$, which is the Passage through which Forces (The EM-Radiation) travel in any Solid either it is in Motion or is at Rest. Laplace's Orbital Angular-momentum $e^{i.2\pi n} = 1$ and for $n = 0, \pm 1, \pm 2, \pm 3, \pm n$, consist the eigenvalues operator L_z which agree with prior Resonance-frequencies $\mathbf{f}_R [S \equiv f_{1=N}, f_2, f_3, f_R = w^2]$ as wavelengths $\lambda \equiv [f_1, f_2 \dots f_n = w^2] \equiv$ the n lobes, or $\rightarrow f_N = n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{n.\sigma.\bar{B}}{8 r^2}$, as the Principal-Stresses σ and the Resonance frequencies $\mathbf{f}_R$ relation, which is the Energy stored in the M-Point-lobes. [70].

The Primary-Momentum $|\bar{\mathbf{w}}|$ of Black Holes, response to Cauchy Ellipsoid-Stress-Tensor as $\{\bar{\mathbf{w}} \perp \bar{\mathbf{B}} \perp |\theta\bar{\mathbf{r}}| \equiv \sigma_1 \perp \sigma_2 \perp \sigma_3\}$. Since the Fixed-Tangential-Planes on, $\bar{\mathbf{w}}$, and, $\bar{\mathbf{B}}$, Nib are alternately Perpendicular to, $\bar{\mathbf{B}}$, and, $\bar{\mathbf{w}}$, common Central Axes of Rotation, then from Gravitation Newton's law $[\bar{\mathbf{w}}]^2 \cdot r^3 = GM = 6,68 \cdot 10^{-11} \times 2,17643 \cdot 10^{-8} = 14,53873 \cdot 10^{-19}$, and from Planck's cave $r_P = 1,6162 \cdot 10^{-35}$ m, in case of Energy Superflow, still happens in Sub-Spaces which is the PNS-Space as, $f_{PNS} = \sqrt[3]{\frac{14,538726 \cdot 10^{-19}}{4 \cdot \pi^2 \cdot [1,6162 \cdot 10^{-35}]^3}} = 8,934121 \cdot 10^{44}$ Hz, and $\sqrt[2]{f_{PNS}} = \sqrt[2]{8,93412 \cdot 10^{44}} = 2,9897 \cdot 10^{22}$ Hz, which is γ -Ray frequency in Black-Holes.

From relation $\bar{\mathbf{w}} = 2\pi f_{PNS}$, then $\mathbf{w}_{PNS} = 56,13308 \cdot 10^{44} \text{ Hz} = 5,613308 \cdot 10^{45} \text{ Hz}$, From Energy $E = h \cdot f_P = [6,6262 \cdot 10^{-34} \text{ J.s}] \cdot [8,934121 \cdot 10^{44} \text{ Hz}] = 5,91993 \cdot 10^{11} \text{ J}$, and in eV $\rightarrow$ Energy $E = [5,91993 \cdot 10^{11}] / [1,6 \cdot 10^{-19}] = 3,694874 \cdot 10^{30} \text{ eV}$, From the Centripetal Force in PMPM Space $F_C = \sigma = \frac{m \cdot v^3}{r} = J \cdot w^2 \cdot r = \bar{\mathbf{B}} \cdot w \cdot r$, then $\bar{\mathbf{B}} = J \cdot w$, or $\bar{\mathbf{B}} = J \cdot w = [\frac{\pi \cdot r^4}{2}] \cdot w = \frac{\pi [1,6162 \cdot 10^{-35}]^4 (5,613308 \cdot 10^{45})}{2} = 3,3770539 \cdot 10^{-96} \text{ J}$ and for eV, $\bar{\mathbf{B}} = 3,3770539 \cdot 10^{-96} \text{ J} / 1,6022 \cdot 10^{-19} \text{ C} = 3,754935 \cdot 10^{-76} \text{ eV}$.

From Solution-3 the magnitude D becomes maximum when $\frac{sQ}{J_1 \cdot \cos \theta} \equiv$ maximum or, when $|\theta\bar{\mathbf{r}}|$ axis $\perp \bar{\mathbf{B}}$ and Cone-angle $\theta \Rightarrow 90$. From Energy relation $E = W = 2L = \bar{\mathbf{B}} \cdot \bar{\mathbf{w}} = J \cdot w^2$ Angular-Momentum $\bar{\mathbf{B}} = [3,3770539 \cdot 10^{-96} \text{ J}] \cdot [5,613308 \cdot 10^{45} \text{ Hz}] = 1,895644 \cdot 10^{-50} \text{ J/s}$, i.e. The Planck's cave, 10^{-35} m, is The Safety-Valve $\equiv$ The Critical State for the Stress Ellipsoids, $\bar{\mathbf{B}}$, $\bar{\mathbf{w}}$, Vectors in order that this Total-Energy to Superflow and be Still into Vacuum $\equiv [10^{-62} - 10^{-35} \text{ m}]$. This Vacuum between the [Gravity cave - Planck's cave] CONSISTS the BLACK - HOLES - CHAOS, as the Recycling-Energy, into which $\rightarrow$ The {Energy - Space - Monad $|\bar{\mathbf{R}}| \equiv |\mathbf{AB}|$ }, Vanishes $\leftarrow$

$\rightarrow$ In Physics exist, Two different Potential-Energies between Planck Spaces and Gravity Spaces as U_{PLANC} and $U_{GRAVITY}$. The difference $\Delta U = U_{GRA} - U_{PLA}$ is the Flow-Energy between the Two Energy Levels $L_{PLA} = 6,6262 \cdot 10^{-34} \text{ m}$, and $L_{GRA} = 1,777 \cdot 10^{-62} \text{ m}$, The Total Energy in Planck's cave is $\rightarrow E_{PLA} = 5,91993 \cdot 10^{11} \text{ J}$, and The minimum Charge in Planck's cave $\rightarrow q_{PLA} = 1Cb = 1,6 \cdot 10^{-19} \text{ eV}$, From Voltage relation $\Delta U = \frac{\text{Energy}}{\text{Charge}}$ issues,

$$1\text{Volt} = \frac{1\text{Joule}}{1\text{Culomb}} \text{ or } 1V = \frac{1J}{1C} \dots(v)$$

In order that 1Cb may Overflow and Flow from Planck's cave To the Gravity cave, then must exist a Voltage $\Delta U > = 3,694874 \cdot 10^{30} \text{ eV}$, and be as $\dots(v)$

$$V_{GRA} = \frac{h \cdot f_P}{1Cb} = \frac{5,91993 \cdot 10^{11} \text{ J}}{1,6022 \cdot 10^{-19} \text{ eV}} = 3,695 \cdot 10^{30} \text{ V, i.e.}$$

$\rightarrow$ When the Energy in Planck's cave L_{PLA} , Increases to an Voltage $> = 3,695 \cdot 10^{30} \text{ V}$ then the motion $\equiv$ Energy between the Two Opposite elements of MP-Dipole $[\oplus \leftrightarrow \ominus]$ Becomes a Stationary Flow $[\oplus, \ominus] \equiv$ Charges $[\oplus - \emptyset - \ominus]$ in Gravity Cave L_{GRA} . So, Energy $\equiv$ motion, exists in L_{GRA} as an $\rightarrow$ Pointy Rotational Centripetal Force $\leftarrow$

→ When the Energy in Planck's cave L_{PLA} , Decreases to an Voltage $= < 3,695.10^{30} \text{ V}$ then motion $\equiv$ Energy between the Two Opposite elements of M-P-Dipole $[\oplus \cup \ominus]$ Creates the A-velocity-vector $\bar{\mathbf{w}}$, which Rotates in the axis $\mathbf{k}$ with respect to variable $\bar{\mathbf{B}}$. So, define Unit-Energy Vectors $\bar{\mathbf{R}} = \sigma / \bar{\mathbf{B}} \rightarrow$ existing on Unit-Space-Monad $|\mathbf{AB}| \equiv |\bar{\mathbf{R}}| \leftarrow$

Or $\rightarrow \{\text{The Energy -Space - Monad } |\bar{\mathbf{R}}| \equiv |\mathbf{AB}| \equiv \text{The Existing Universe}\} \leftarrow$

10e: An Analysis of the Vacuum Energy: [70 -74]

Galileo's Principle of Equivalence states that, Inertial mass is equal to the Gravitational mass and acceleration $a = d\bar{v} / dt$ equal to acceleration due to gravity, g . [39] Gravity is the Stationary force $\rightarrow [\nabla i = 2(wr)^2] \leftarrow$ on the base for all motions, which is the $\rightarrow$ Medium - Field - Material - Fragment, $|\pm s^2| = (wr)^2 = [\text{MFMF}] \leftarrow$ in all universe and so Newtonian theory of gravity acting instaneously between two separated masses is correct. Maxwell's equations Predict Electromagnetic waves in and out of monads, while Einstein's equations of GR Predict Gravitational-waves that travel at the speed of light in order to give an explanation for Simultaneity. G-Relativity failed to conceive the Gravity force as a Stationary force restraining breakages for monads between the Gravity length $\equiv \{\text{MFMF}\}$ cave 10^{-62} which is the beyond Planck length, and Planck's length $\equiv \{\text{PNS}\}$ cave 10^{-35} . Let call this in between distance $\rightarrow [10^{-62} \text{ -- } 10^{-35}] \equiv \text{Vacuum}$.

Breakages acquire different velocities and different Energy and because follow cycloid trajectories thus need the same time (isochrones) to reach [STPL]line [59]. The Fermat's Principle of Least time in Isochrones Principle is embedded in all wavelength λ , as vector monads. During Intrinsic Diffraction, $d\bar{s} = \lambda$, of isochronous motion of vectors, frequency f , doesn't change and only velocity $\bar{v}$, and wavelength λ , changes therefore from equation $\rightarrow \lambda = \bar{v} T = \bar{v} / f, \rightarrow \bar{v} = \lambda f$ and from Acceleration $a = d\bar{v} / dt = (d\lambda/dt).f + \lambda(df/dt)$ then $\rightarrow a = g = d\bar{v} / dt = (d\lambda/dt).f \leftarrow$ since $f = \text{constant}$, or

Let $\lambda \rightarrow$ be the wavelength of a moving monad, $t = \lambda / c \rightarrow$ is the needed Time to cross length, λ , $s = a.t^2 / 2 \rightarrow$ Deflection due to acceleration, a , $H = g.t^2 / 2 \rightarrow$ Deflection due to acceleration of g , and $\rightarrow t^2 = 2. H / g \dots\dots (1)$

For monad $s = \lambda$ then $s = a.t^2 / 2 = c T$ where, T is the Period of Isochronous displacement and, $t^2 = 2. c T / a..(2)$. Equating (1),(2) then $c T / a = H / g$, and since in gravity field the cycloidal motion (Simultaneity) defines the same displacements $c T$, H , then $c t = H$ and so $a = g$, Therefore, all Particles have the same acceleration g , in our gravitational field with frequency unchanged, and $\rightarrow$ velocity, $d\bar{v}$, with wavelength, λ , to be changed so light being a Particle also, is deviated in gravity field and, the Inertial mass is equal to the Gravitational mass. i.e.

The Necessary and Sufficient Condition for this Equality happens only in Mass of Material-Point, where $c T = H$ of this Isochronous motion where then Inertial mass $\equiv$ Gravitational mass $\rightarrow m = \frac{2E}{a_a} = [\frac{\bar{\mathbf{B}} \cdot \bar{\mathbf{w}}}{\bar{\mathbf{B}}_{\text{XW}}}]$. J = a number, meaning that mass is a Number only, which measures the Magnitude of any two charges $q_1 \equiv m_1, q_2 \equiv m_2$ or reactions to any change of motion. In $c \rightarrow$ The Energy Stores in the Material Point, is Proofed that Energy is stored in the, n , loops of Monads $\equiv$ Energy Vectors $\equiv$ Quaternion and, NOT in mass, with the current concordance model. so Energy in $n =$

1 loop $\rightarrow W = \left[\frac{4\pi r^2}{2}\right] \cdot \mathbf{f}_1$ and for the $n^{\text{th}} \rightarrow \mathbf{W}_n = \left[\frac{4\pi r^2}{2}\right] \cdot \mathbf{f}_n = n \frac{(1+\sqrt{5}) \cdot \sigma r}{2}$ Total Energy in n loops $\rightarrow \mathbf{W}_{n(n+1)} = \left[\frac{4\pi r^2 f_1}{2}\right] \cdot n \cdot (n+1)$ where $n = 1, 2, 3, 4, \dots \infty$ Issuing that Mass $\rightarrow m \equiv \frac{2E}{a_a} \equiv \left[\frac{\bar{\mathbf{B}} \cdot \bar{\mathbf{w}}}{\bar{\mathbf{B}} \times \bar{\mathbf{w}}}\right] \cdot J \equiv W \equiv \left[\frac{4\pi r^2 f_1}{2}\right] \cdot n \cdot (n+1) \leftarrow$ a number k as $k = T_z =$ Tensor (the length) of the vector, $\bar{z} \equiv m$, in Euclidean coordinates, and which magnitude is, $k = \mathbf{T}_z = \sqrt{y_1^2 + y_2^2 + y_3^2 + y_n^2}$. [87-90]

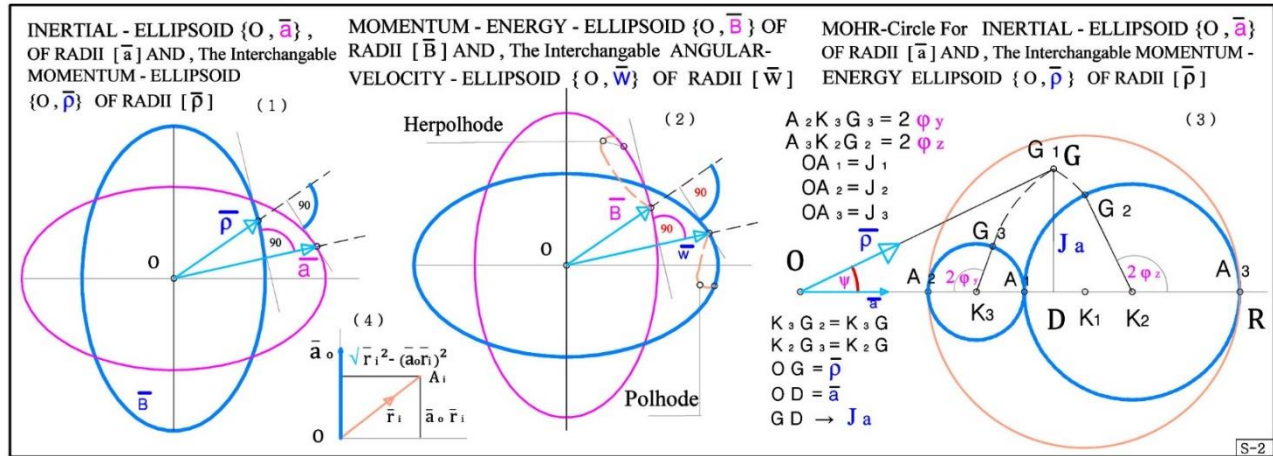


Figure 20: Shows The Geometrical-meaning of $\bar{a}_0 \bar{r}_i$, and $\sqrt{\bar{r}_i^2 - (\bar{a}_0 \bar{r}_i)^2}$ terms.

In (1) is shown the Inertial - Ellipsoid $(O, \bar{a}) \equiv$ [The $\bar{\mathbf{w}}$ - Space Type] of Radii, $\bar{a}$, and the Interchangeable Momentum - Ellipsoid $(O, \bar{p})$ of Radii, $\bar{p}$. $(O, \bar{p})$. The same for $\{\bar{\mathbf{B}}, (O, \bar{\mathbf{B}})\} \equiv$ [The $\bar{\mathbf{B}}$ - Space Type]

In (2) is shown the Momentum - Energy - Ellipsoid $(O, \bar{\mathbf{B}}) \equiv$ [The $\bar{\mathbf{B}}$ - Energy Type] of Radii, $\bar{\mathbf{B}}$, and the Interchangeable Angular Velocity - Ellipsoid $(O, \bar{\mathbf{w}}) \equiv$ [The $\bar{\mathbf{w}}$ - Energy Type] of Radii, $\bar{\mathbf{B}}$.

In (3) is shown in Mohr-method, the Geometrical construction from the two Interchangeable Ellipsoids $\rightarrow$ The Energy-Rotational Momentum-Ellipsoid $(O, \bar{p})$, the {Work} and the Angular-Velocity-vector -Unit-sphere $\rightarrow$ The Inertial- Ellipsoid $(O, \bar{a})$, {Force} and the reaction to the velocity-change-motion $\rightarrow$ The Mass - Ellipsoid $(GD = J_a \equiv \bar{\mathbf{M}})$, {Mass}. Between the Types of Ellipsoids issues $\bar{p} \cdot \bar{a} = J_a \dots (12)$

The above Property of the two Interchangeable-Ellipsoids defines the deep relation between, The Angular-velocity-Ellipsoid $\rightarrow J_1 w_1^2 + J_2 w_2^2 + J_3 w_3^2 = 2L = C = J_a \bar{\mathbf{w}}^2 \dots (13)$ and The Momentum-Energy-Ellipsoid $\rightarrow \frac{1}{J_1} B_1^2 + \frac{1}{J_2} B_2^2 + \frac{1}{J_3} B_3^2 = 2L = C = J_a \bar{\mathbf{w}}^2 \dots (13a)$

Conclusions:

From the generated Radius $\bar{\mathbf{w}}$, Fig-20-1= Angular-Velocity of a Solid, corresponds another Radius $\bar{\mathbf{B}}$, Fig-20-2 Angular-Momentum, to the Common-Point O of Rotation. The Radius $\bar{\mathbf{B}}$ is Perpendicular to the Tangential-Plane at the Nib of the $\bar{\mathbf{w}}$ Angular-Velocity-Ellipsoid. Similarly the Radius $\bar{\mathbf{B}}$ is Perpendicular to the Tangential-Plane at the Nib of the $\bar{\mathbf{B}}$ of the Angular-Momentum-Ellipsoid. From relation (12), the vertical-Projection of the radius, $\bar{p}$, at the

corresponding conjugate radius $\bar{a}$, of the Unit Sphere, denotes the meter to the last Solid Angular momentum.

11e: Epilogues and General Remarks for Atoms and Black - Holes

1. The origin of Space [S] becomes, through the Principle of Virtual Displacements $W = \int_A^B P \cdot ds = 0$, from any Primary Point A which is the Space, to Point B which is the Anti-space as the Inner distance of Space and Anti-Space in all Layers. The origin of Energy becomes through the same Principle because are co-related and is the Work executed by the displacement, ds , which is conserved and never vanishes. This means that Universe is Energy-Space and nothing else, and which follows the Glue-Bond-Principle in all Positions and Layers. The Torsional oscillation of Caves (cleft, slit) is transformed as the inner Wave - frequencies which in turn to monads and moving Particles transforming Inward - Spin to Outward-Spin and motion. [58]
2. The Torsional Momentum in analysis [64A], is a Vector noted as $\bar{B}$, and is the Spin of monads. The Glue-Bond Pair of Opposites $[\ominus, \oplus]$, Creates Rotation with angular-velocity $w = v / r$, and velocity $v = w r = \frac{2\pi}{T} = 2\pi r \cdot f = \left[\frac{\sigma}{2}\right] \cdot (1 + \sqrt{5})$, and or frequency $f = \frac{(1 + \sqrt{5}) \cdot \sigma}{4\pi r}$, with Period $T = \frac{4\pi r}{\sigma(1 + \sqrt{5})} = \frac{2\pi r}{\sigma \Phi}$, where $\pm \sigma$ are the two equal and Opposite, Centripetal F_p and Centrifugal F_f Glue-bond forces.
3. The Energy Produced by a Reference System $\{D_A - P_A\} \equiv [R](x', y', z', t')$ moving with velocity, $\bar{v}$, Parallel to, $x - x'$, axis with respect to the fixed and Absolute System as $\{D_A - O\} \equiv [S](x, y, z, t)$, is conserved. The Energy of the whole Universe is defined as a whole, all at once, and not, the Energy of different pieces. It was referred that Energy in Gravitational -Field is Torsional and Negative and is always attractive. In General-Relativity is referred that Space time is giving Energy to matter or absorbed it from matter, and thus the Total Energy is not conserved. Here are Not clarified the three Basic Quantities, Energy, Matter and Time, But referred as the simple words. Motion happens as the Torsional oscillation of Caves and the Virtual Displacement. The Argument < Energy is not conserved but it changes because Spacetime does > is the greatest-confusion for these magnitudes.
4. In [31-36] and [39] was clarified that, The Work executed as, Impetus, Angular-Momentum and the Energy Produced in all Systems, and for Material-Point, is Conserved and also to Infinite-Material-Points, which such are the Particles which are unaffected from this execution when rotating. The Above logic of Space, Anti-Space in STPL-Mechanism allows Material-Geometry to Produce all known Fundamental - Particles, [35-38] and shows a New direction for Energy-Quantization in all levels which is dependent on the Material Wave-frequency, $f_m = \frac{\varphi_0 \cdot \sqrt{c^2 - r^2}}{v}$ and which is Geometrically embedded in all monads, where Lorentz Factor $\varphi = \varphi_0 \cdot t = \left(\frac{v_1}{\sqrt{c^2 - r^2}}\right)$. t , and v_1 = the relative velocity of Space and Anti-space at Points A, A_E respectively. The Gravity-Field in PNS-Space and the Gravity-Forces.
5. In [36 -37 -52] was shown that All Particles are characterized by their quantized cave which is the minimum Space $[V = \frac{4\lambda^3}{3\pi} = \frac{4(w^2 r^2)^3}{3\pi}]$ composed of an inner Electromagnetic Wave constituent $[E \perp H]$, $h = 2\pi/\lambda$, where the reaction to these velocity motions is what

is called the mass, and which is $\rightarrow [m = (pr).w/c^2 = \frac{h.w}{2\pi.c^2}]$. The external energy momentum is $[p = \frac{h}{2\pi\lambda}]$ and Spin (the helically rotating Electric field vector corresponding to a circularly Polarized Electromagnetic wave Propagating with attenuation to velocity's direction)

6. Conservation laws of Energy linear $mv = F.ds$ and Angular Momentum $r.mv = B = Jw$ are satisfied by the inner Anti-cycloidal motion, (on equilibrium evolute curve)

The Gravity - Force is equal to $F_g = |\bar{q}|.[E + \bar{v} \times P]$ and is exerted on any movable Particle with charge $\bar{q}$. Gravity - Field $G_f = [E + \bar{v} \times P]$, is the un-movable, Rest forced welded Spinning dipole, $\rightarrow [|(\bar{w}.r)^2| \leftrightarrow |-(\bar{w}.r)^2| = |\lambda|] \equiv [\{A(P_A) \leftarrow 0 \rightarrow (P_B)B\}] \leftarrow$ and because is Rest then with three Units becomes the un-movable Torsion $\pm \Lambda$ as, $\rightarrow [|(-\bar{w}.r)^2| \leftrightarrow |(\bar{w}.r)^2| \leftrightarrow |-(\bar{w}.r)^2|] = |\Lambda| \equiv$ Spin in Gravity $\leftarrow$ Since for three Units is applicable the same and in Material Geometry then issues $\rightarrow [|c(-\bar{w}.r)^2| \leftrightarrow |c(\bar{w}.r)^2| \leftrightarrow |-c(\bar{w}.r)^2|] = c [|(-\bar{w}.r)^2| \leftrightarrow |(\bar{w}.r)^2| \leftrightarrow |-(\bar{w}.r)^2|] = c. [\oplus \leftrightarrow \ominus] \leftarrow$ i.e. Gravity travelling at light speed $\rightarrow c|\Lambda| \equiv c.$ Spin $\leftarrow$ and because is jointed with forces, this means that Newton's laws issue in Both, Absolute System [S] and to the Relative System [R] in PNS Space. The Gravity - Force in the Rolling Heap is equal to $\rightarrow F_D = |\bar{q}|.[E_D + \bar{v}.P_D] = |\bar{q}|.[E_D + \equiv \bar{c}.P_D]$. [28]

The two Perpendicular Static - force fields E and Static force field B of Space-Anti-Space experience on any moving dipole $A \perp B = [\lambda, \Lambda]$ with velocity $\bar{v}$, Total force $F = F_E + F_B = (\lambda m). E + (\lambda m). \bar{v} \times B$ which combination of the two types result in a Helical motion with stability demand $\rightarrow E = -(\bar{v} \times B) \perp -(\bar{v}.B) \dots (N4)$ which is the alternative conservation of momentum $[k^2 = \Lambda^2/2\lambda m]$ in the two Perpendicular fields $E \perp B$.

In case $(\lambda m) = q$ then total force $F = F_E + F_B = q.E + q.\bar{v} \times B = q.[E + \bar{v} \times B] \rightarrow$ which is Lorentz force in the Electromagnetic crossed fields E and B, with Electric charge $q = \lambda m \equiv \bar{w}$, $\bar{B}$ Momentum, which are the Two Beyond Gravity Fields interpreting the fundamental cause (effect) of motion, in small and large scales.

General Remarks

1. SINCE Antigravity IS The minimum Granular-Quantized-Energy - $\bar{B}$, becoming from the Gravitational Force G, when is acting into The -Planck- Cave, represents the Basic Equilibrium Quantum-Raw-material, for All the Energy structures i.e. the Hydrogen cave Atoms caves and Compounds, Molecules and Crystal, or everything the Material. In the Absence of (Equilibrium Quantum-Raw-Energy) which may happen to the semi major axis, $k = 1/c = f_n^2.a^3$, of the Big Planets Mass THEN Energy becomes $\rightarrow E = G M m / 2a$.
2. SINCE Dual Photon [Particle and Wave] Precedes the Dual Planck's SPIN $\equiv \bar{B}$, as is [Gravity and Antigravity] and this because velocity $\Rightarrow \bar{c} = [\frac{G.\Phi}{A}]$ Precedes Spin $\Rightarrow \bar{B} = r m \bar{c}$, Photon's velocity $\bar{c}$ is NOT Affected from the (Equilibrium Quantum Raw-Energy), in contradiction to the Spin cave r which is affected.
3. SINCE Light velocity, $\bar{c}$, changes Phase every 90° and the created Work $W = c_y \times$ [Quarter circle 1-0-4] is Symmetrically Stored from $0^\circ \rightarrow 90^\circ$ alternately +, -, -, +, in [Quarter circle 1-0-4], in [Quarter circle 4-0-2], in [Quarter circle 3-0-1], so this Momentum $\bar{B} = r m v$

- $= \pm \left[\frac{\pi \cdot r^2}{4} \right] \cdot \bar{c} \times \bar{r}$ from $\pm \left[\frac{\pi \cdot r^2}{4} \right] \equiv$ The Quarter circle Energy Plane. Where $+ \bar{B} =$ The Gravity - Matter and $- \bar{B} =$ The Antigravity-Antimatter.
4. SINCE The Energy in Black Holes is $\Rightarrow \mathbf{B}_{BHE} = 2 \cdot \pi^5 \cdot r^3 \cdot f^2 = (\pi r)^3 \cdot w^2 = (\pi r)^3 \cdot [2\pi f]^2$ i.e. Velocity in Black-Holes is Related to Cave, r^3 , and Energy w^2 times of light velocity then cave r again is Affected from the (Equilibrium Quantum Raw-Energy). This Property of G , means that the only one Force which effects on the Rest-Space in Torsional motion, and from to light velocity vector $\bar{c}$, is the gravity g only. Always issues that, The Stability of Space - Anti-Space, occurs IN the Neutral-Space. G Affection is for all Planes because this issues and for the Black Holes $G = \mathbf{k}_E g = \mathbf{g} \cdot \mathbf{k}_L \mathbf{g}_L = \mathbf{k}_{BH} \cdot \mathbf{g}_{BH}$.
5. SINCE from Kepler constant $k = 4\pi^2 \cdot r^3 \cdot f_p^2$, or $1 = c \cdot r^3 \cdot f_p^2$, acceleration $g = \frac{2\pi v}{T}$ and from velocity $v = \frac{2\pi r}{T} \rightarrow$ frequency $f_1 = \sqrt{\frac{g}{4\pi^2 r}}$ in Stationary Photon $[\mathbf{B}_P \equiv \mathbf{f}_{1=N}, \mathbf{f}_2, \mathbf{f}_3, \mathbf{f}_R] \equiv [E^2 + H^2] = 2(2r) \cdot \bar{c} \cdot \sin 2\varphi$, Then for Both $\Rightarrow$ Planar $[\rightarrow r \rightarrow 0$ then $\mathbf{f}_P \rightarrow \infty \leftarrow]$ and for Atoms-Black-Hole $[\rightarrow \mathbf{f}_P \rightarrow 0$ then $r \rightarrow \infty \leftarrow]$ Exist all above for Energy in Black-Holes

12e: The Origination of Fundamental Particles: [59-60-61]- [111]

1. The {Six, Triple Points, Line} $\equiv$ [STPL] $\rightarrow$ Fundamental Particles Mechanism $\leftarrow$

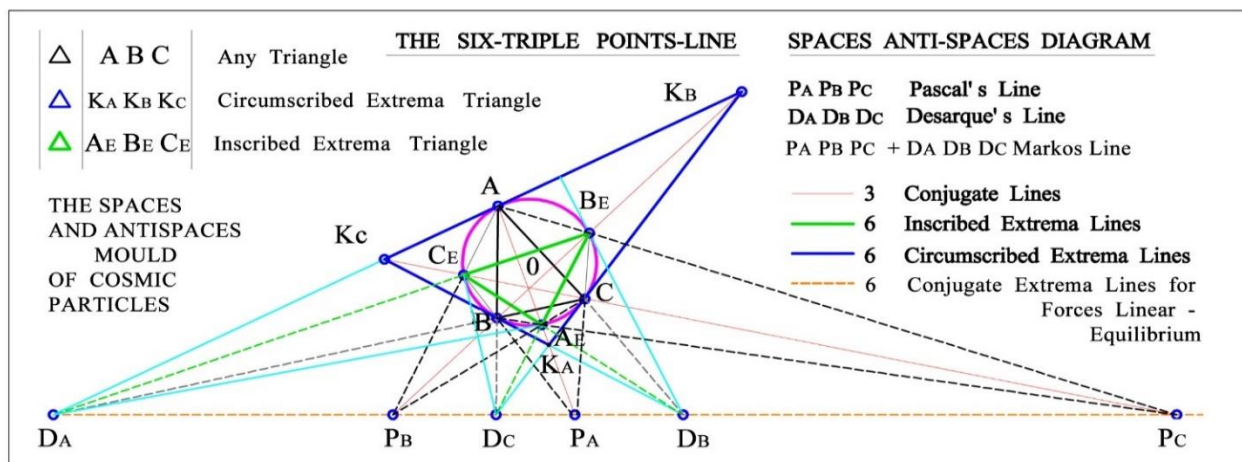


Figure -21- : The Six-Triple-Points-Line [STPL]IS of Points, $D_A, D_B, D_C - P_A, P_B, P_C$, on where, The $\{\oplus$ -Space $[A, B, C] \equiv$ any three Points in a Plane or Volume forming a Circle or a Sphere}, The $\{\ominus$ - Anti-Space = The Tangential to Space Points on the Neutral Circle or Sphere as Material-Triangle $[K_A K_B K_C]$ }, The $\{\otimes$ = Sub - Space $[A_E, B_E, C_E]$ Perspective-Material-Triangle $[A_E, B_E, C_E], [\oplus \leftrightarrow \ominus]$. On this 3D Mechanism Of Space $\equiv$ The three Points $[A, B, C]$, Of Anti - Space $\equiv$ The three Tangential Points $[K_A K_B K_C]$ Of Sub-Space $\equiv$ The three Perspective Points $[A_E B_E C_E]$ in Neutral Circle, And from Quaternion-Action of the Opposites $[\oplus - \otimes - \ominus]$, are then Generated the, $7 \times 3 \times 3 = 63$, Plane Conductors $\rightarrow ds \equiv [\oplus \leftarrow ds \rightarrow \ominus] =$ which circularly formulate all The Elementary Particles which coexist on STPL, i.e. The STPL - Line is the Physical-Rotor for the Cosmic-Particles origination.

AS Material-Points, OR and as Particles. The Analytical Proofs is in [59-60-61] where Triangles ABC , $K_A K_B K_C$, $A_E B_E C_E$, are Perspective between them and consequently between The Spaces, Anti-Spaces and The Sub-Spaces in PNS. This Property of Perspectivity between the Spaces is followed by The Parallel-Resonance and circuits, where is influenced by the currents flowing through each Parallel - Branch, so such is the Influence of the three (+) Space, (-) Anti Space, (®) Sub-Space, and (+ - = 0) Neutral-Space from the three Charges $[\oplus - \emptyset - \ominus]$ in the [STPL]Conductors in {MFMF} Space.

e: Conclusions 1

Nature is a continuous motion of The $\rightarrow [+ \text{ Charge} = s^2 = \oplus]$ to $[- \text{ Charge} = -s^2 = \ominus]$ Through $0\text{-Charge} = [2s^2 = \emptyset]$, and it is an Physical-Intrinsic Property of the Fundamental Particles and this because any Two Charges of the Same Charge $[+ \rightarrow +]$, $[- \rightarrow -]$ Repel, while any Two Charges of the Opposite - Charge $[+, -]$ Attraction. Considering [PNS]= [Primary - Neutral -Space]= Quaternion and this Energy- Quaternion is $[|\Lambda|. \nabla + \Lambda \times \nabla] \equiv \bar{z}$, where Λ = The motion Property. From Quaternion Action (©) of a $\bar{z} = [s \pm \nabla i]$ On-Itself is the Binomial-Type i.e. $[s \pm \nabla i]^2 \equiv s^2 + |\bar{\nabla}|^2 \cdot \nabla i^2 + 2|s|.|\bar{\nabla}| \cdot \nabla i \equiv s^2 - |\bar{\nabla}|^2 + 2|s|.|\bar{\omega}r|. \nabla i \equiv \rightarrow [s^2 - |\bar{\nabla}|^2 + [2\bar{\omega}r].|s.r|. \nabla i] \leftarrow$ in {MFMF} Space, where, $\rightarrow$ The Angular-velocity is $|\bar{\omega}| = [p] \pm [\sqrt{D}]$, or as, $[p] \pm [\sqrt{D}]i \leftarrow s^2 = p \rightarrow$ Is the Real-Part of the New Quaternion and is a Positive -Scalar magnitude.

$-|\bar{\nabla}|^2 = -p \rightarrow$ The always Imaginary-Anti-Space which is always Negative-Scalar magnitude. $[2\bar{\omega}r].|s.r|. \nabla i] \rightarrow$ The Double Angular-velocity Energy-Term which is a Vector magnitude

e: Conclusion 2

In order that a Material-Point A, moves to another Material-Point B, a Force F must Push Point A to Point B. This happens to Coulomb-law of Charges and Forces, and also to the Magnets where The $\oplus$ Charge, moves to the $\ominus$ Charge. These Charges are the 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, as $(+, 0, -)$ on the [STPL mechanism in MFMF] and where is $|s| = |\bar{\nabla}|^2$ and $-|s| = -|\bar{\nabla}|^2$, as $+s^2 = +(\bar{w}.r)^2 \equiv \oplus \rightarrow \oplus \equiv +p \equiv + \text{ Charge}$. $-|\bar{\nabla}|^2 = |\bar{w} \times \bar{r}|^2 = -(\bar{w}.r)^2 \equiv \ominus \rightarrow \ominus \equiv -p \equiv - \text{ Charge}$. $[2\bar{\omega}r].|\bar{\nabla}||\bar{r}. \nabla i = 2|\bar{\nabla}|^2 = 2(\bar{w}.r) \equiv 2[\oplus \leftrightarrow \ominus] \equiv 2p \equiv 0 \text{ Charge}$.

e: Conclusions 3

Remarks on The Physical meaning of the Geometrical-Properties. The [STPL] $\equiv$ The Six Triple Points Line Mechanism and is a Geometrical-Mould in our Physical-World on which Elementary Particles are created and is Similar to The Stationary $\rightarrow$ Tetrahedron, In-Sphere, Cube, Ex-Sphere $\leftarrow$ Mechanism of Atoms construction.

Markos Program < Programming the Atoms Bonding & Their Compounds > for any Systems with known Status, can be calculated for any time This-Mechanism of Atoms by {Carrier-Modulating Modulated, Demodulation-Process} using Bioelectronics.

1. [STPL] is a Physical Mechanism that Produces and Composite all the Opposite-Space-Points from Spaces (The Three characteristic Points A-B-C forming the Plane and D that of Volume), Anti - Spaces which are (The Tangential Zero Plane Points, K_A, K_B, K_C , and similar to Positive axis which passes from Zero in order to Pass to the Negative axis),

The Sub- Spaces (The corresponding Points, A_E, B_E, C_E , of Opposite direction through the Zero-Space) and, Neutral - Spaces (The Common Circle for, Sub-Space-Polygons, as circle or and Sphere in {MFMF} Space, as Figure-1,

2. Points A, B, C and lines AB, AC, BC of Space, communicate with the Extrema corresponding $K_A K_B, K_B K_C, K_C K_A$ of Anti-Space, separately or together with bands of three lines at Points P_A, P_B, P_C , and with bands of four lines at Points D_A, D_B, D_C , on Common Circumscribed circle (O, OA), consisting the Neutral-Sub-Space. [17]
3. If any monad AB (Quaternion or Vector), $[s \pm \bar{v} \cdot \bar{v} i]$, all or Parts of it, somewhere exists at Points A, B, C or at segments $A K_A, B K_B, C K_C$ then [STPL]line or lines is the Geometrical expression of the Action of the External Triangle, $K_A K_B K_C$, the tangents as extrema is the Anti-Space, on the two Extreme Triangles ABC and K_A, K_B, K_C , (of Space Sub-Space) creating, 1, 3, 5, Spin, the minimum Energy - Quanta. This is the How Opposites, from{MFMF} Space, combine and Produce On STPL - Mechanism, and in PNS - Space, the Elementary Particles.

e: Conclusions 4

1. Since Elementary Particles are of Positive and of Negative nature then they may have also Positive or Negative Energy and for the Tangential Zero Plane Points $A_E B_E C_E$, which are Twice-Perspective between them Have Neutral Energy. The Negative charge layers depend on The Angular-velocity $|\bar{\omega}| = [p] \pm [\sqrt{\bar{D}}]$, and $|\bar{\omega}| = [p] \pm [\sqrt{\bar{D}}]i$, either for Real or for Imaginary magnitudes, for all Possible Energy levels.

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

The coupling of quantized Space and Energy (ds and dP) becomes on Points of dipole Ai-Bi through the Scalar Potential field P (X,Y, Z) where X,Y, Z are the generalized Forces mapping to Flux Vector field $V_p = \nabla P = [(\angle P / x) x + (\angle P / y) y + (\angle P / z) z] = [\bar{J} \cdot x + \bar{E} \cdot y + \bar{B} \cdot z]$, to the Density Scalar - field $D_p = \nabla \cdot V_p = \nabla \cdot (\nabla \cdot P)$, and to the Changeable Vector field $C_p = \nabla \times V_p = \nabla \times (\nabla \cdot P)$. Because the curl of the Gradient of a Scalar field vanishes then, $C_s = C_p = 0$ (which is the Produced fields).

The gauge freedom Unit vectors $d\bar{s} = s(n1,2,3)$, $d\bar{P} = P(n1,2,3)$.© depended in Space and Anti- Space to be a source or sink, then $x,y, z \leftrightarrow -x,-y,-z$ which presupposes Impulses $PA = -PB$, is α force P as $P = W/ds = \angle / \delta [W] = \nabla W = \nabla \cdot [\nabla J \cdot \odot] = \nabla^2 J \cdot \odot$ where Vector $J = (\angle P / x) x = dP \cdot (dx) \cdot \odot = X p$ and, $\nabla^2 J \rightarrow$ the Laplacian of vector field J, and $G \cdot \nabla^2 \cdot (a) \pm G \cdot \nabla^2 \cdot (b) \cdot i = F = \partial U / \partial \delta j$.

It was shown that Cycloid $\leftrightarrow$ Anti-Cycloid are the $\pm$ Space and the $\pm$ Energy of a Rolling-Circle on a straight line, and Space-Energy State may coexist Because follow the

Momentum-layers, $|\bar{\omega}| = [p] \pm [\sqrt{\bar{D}}]$, and as $|\bar{\omega}| = [p] \pm [\sqrt{\bar{D}}]i$

Electrons circulate around nucleus forever using conserved interchanged magnitude $\bar{J}$. as velocity field, magnitude $\bar{E}$ as atom's Energy level field and $\bar{B}$ as energy exchanged field with the nucleus. The tangent acceleration is $a(t) = [\ddot{u} / |u|]$. $d|u| / dt$, and Centrifugal acceleration is $a(c) = |u| d / dt [\ddot{u} / |u|]$. Using (cgs) conventional units then $\bar{E}$ and $\bar{B}$ as have the same units. Spin is macroscopic (a) on Bound charge of Space and Anti-

Space, and microscopic (i) on any separate Dipole, $A_i B_i$, combined through [STPL] Mechanism to Produce a Positive and Negative charge layer on both the Conductors sides, so the two Energy fields Split as $E = E_a + E_i$ and $B = E_b + E_i$ define the unified Macroscopic and the unified Microscopic bound conservation of Work. In Stress System, the State of Principle Stresses (σ) at each Point (it is the double Refraction in Photo-Elasticity) and its Fringes are, the Isochromatic lines $[(\sigma_1 - \sigma_2) = J k / d]$ or Isochromatic surfaces. $E_a + E_i$. The Material-Point Photon is Wave $[\vec{v} \cdot \vec{f}_n] \rightarrow [\vec{v} \cdot \vec{f}_n] \rightarrow [\vec{v} = \vec{c} = \lambda \frac{f}{\phi}]$, Particle $\rightarrow [f_1 = (E^2 + H^2)]$

2. Since Electron is continuously rotating in Orbits so the Electromagnetic Wave is also rotating, therefore is needed a Proper-Stationary-Magnet on which the Rotation to become an Oscillation in order to succeed the clear 3-dimensioned, Φ^3 , Magnetic - Resonance - Imaging. The [MRI Technik] and the other Systems use this Property so called Bottom-Information. This Property of Spinning in all depths of Energy-caves allows the Granularity of Energy in Energy - loops, and after to be Bonded. This Property of Electron may be used for Cancer Chromosomes.
3. a) In Vacuum $\equiv [10^{-62} - 10^{-35} \text{m}] \rightarrow$ The {Energy-Space-Monad $|\vec{R}| \equiv |AB|$ }, Vanishes.
 b) In Vacuum exists only Pointy vibrating between the Opposite Dipole $[\oplus \cup \cup \ominus]$.
 c) As Unit-Energy Vectors $\vec{R} = \sigma / \vec{B} \rightarrow$ exists ON Unit-Space-Monad $|AB| \equiv |\vec{R}| \leftarrow$ Then $\rightarrow$ {The Energy-Space - Monad $|\vec{R}| \equiv |AB| \equiv$ The Existing Universe}
 d) STPL-Line is the Physical - Rotor for the Cosmic-Particles origination [111]

References

- [1] Matrix Structure of Analysis by J.L. MEEK library of Congress Catalog 1971.
- [2] Der Zweck im Rect by Rudolf V. Jhering 1935.
- [3] The great text of J. L Heisenberg (1883-1886) English translation, Richard Fitzpatrick
- [4] Elements Book 1.
- [5] Wikipedia.org, the free Encyclopedia.
- [6] Greek Mathematics, Sir Thomas L. Heath, Dover Publications, Inc, New York. 63-3571
- [7][T] Theory of Vibrations by William T. Thomson (Fourth edition).
- [8] A Simplified Approach of Squaring the circle, <http://www.scribd.com/mobile/doc/33887739>
- [9] The Parallel Postulate is depended on the other axioms, <http://vixra.org/abs/1103.0042>
- [10] Measuring Regular Polygons and Heptagon in a circle, <http://www.scribd.com/mobile/doc/33887268>
- [11] The Trisection of any angle, <http://vixra.org/abs/1103.0119>
- [12] The Euclidean philosophy of Universe, <http://vixra.org/abs/1103.0043>
- [13] Universe originated not with BIG BANG, <http://www.vixra.org/pdf/1310.0146v1.pdf>
- [14] Complex numbers Quantum mechanics spring from Euclidean Universe, <http://www.scribd.com/mobile/doc/57533734>

- [15] Zeno`s Paradox, nature of points in quantized Euclidean geometry, <http://www.scribd.com/mobile/doc/59304295>
- [16] The decreasing tunnel, by Pr. Florentine Smarandashe, <http://vixra.org/abs/111201.0047>
- [17] The Six-Triple concurrency line – points, <http://vixra.org/abs/1203.0006>
- [18] Energy laws follow Euclidean Moulds, <http://vixra.org/abs/1203.006>
- [19] Higgs particle and Euclidean geometry, <http://www.scribd.com/mobile/doc/105109978>
- [20] Higgs Boson and Euclidean geometry, <http://vixra.org/abs/1209.0081>
- [21] The outside relativity space – energy universe, <http://www.scribd.com/mobile/doc/223253928>
- [22] Quantization of Points and of Energy, <http://www.vixra.org/pdf/1303.015v21.pdf>
- [23] Quantization of Points and Energy on Dipole Vectors and Spin, <http://vixra.org/abs/1303.0152>
- [24] Quaternion`s, Spaces and the Parallel Postulate, <http://vixra.org/abs/1310.0146>
- [25] Gravity as the Intrinsic Vorticity of Points, <http://vixra.org/abs/1401.0062>
- [26] The Beyond Gravity Forced fields, <http://scribd.com/mobile/doc/203167317>
- [27] The Wave nature of the geometry dipole, <http://vixra.org/abs/1404.0023>
- [28] Planks Length as Geometrical Exponential of Spaces. <http://vixra.org/abs/1406.0063>
- [29] The Outside Relativity Space – Energy Universe, <http://www.scribd.com/mobile/doc/223253928>
- [30] Universe is built only from Geometry Dipole, Scribd: <http://www.scribd.com/mobile/doc/122970530>
- [31] Gravity and Planck`s Length as the Exponential Geometry Base of Spaces, <http://vixra.org/abs/1406.0063>
- [32] The Parallel Postulate and Spaces (IN SciEP)
- [33] The fundamental Origin of particles in Planck`s Confinement. On Scribd & Vixra (FUNDAPAR.doc)
- [34] The fundamental particles of Planck`s Confinement. www.ijesi.com (IJPST14-082601)
- [35] The origin of the fundamental particles www.ethanpublishing.com(IJPST- E140620-01)
- [36] The nature of fundamental particles, (Fundapa.doc).ijesit.com–Paper ID: IJESIT ID: 1491
- [37] The Energy-Space Universe and Relativity IJISM, ijism.org–Paper ID: IJISM – 294 [V2, I6,2347-9051]
- [38] The Parallel Postulate, the other four and Relativity (American Journal of modern Physics, Science PG – Publication group USA),1800978 paper.
- [39] Space-time OR, Space-Energy Universe (American Journal of modern Physics, science PG Publication group USA) 1221001– Paper.
- [40] The Origin of, Maxwell`s-Gravity`s, Displacement current. GJSFR (Journalofscience.org), Volume 15-A, Issue 3, Version 1.0
- [41] Young`s double slit experiment [Vixra: 1505.0105] Scribd: <https://www.scribd.com/doc/265195121/>

-
- [42] The Creation Hypothesis of Nature without Big-Bang. Scribd:
<https://www.scribd.com/doc/267917624/>
 - [43] The Expanding Universe without Big-Bang. (American Journal of modern Physics and Applications Special issue: <http://www.sciencepublishinggroup.com/j> / Science PG-Publication group USA – 622012001– Paper.
 - [44] The Parallel Postulate and the other four, The Doubling of the Cube, The Special problems and Relativity. <https://www.lap-publishing.com/>. E-book. LAMBERT Academic Publication.
 - [45] The Moulds for E-Geometry Quantization and Relativity, International Journal of Advances of Innovative Research in Science Engineering and Technology IJIRSET:
<http://www.ijirset.com/>..Markos Georgallides
 - [46][M] The Special Problems of E-geometry and Relativity <http://viXra.org/abs/1510.0328>
 - [47][M] The Ancient Greek Special Problems as the Quantization Moulds of Spaces.
[www.submission.arpweb.com\(ID-44031-SR-015.0](http://www.submission.arpweb.com(ID-44031-SR-015.0)
 - [48][M] The Quantization of E-geometry as Energy monads and the Unification of Space and Energy.
[www.ijera.com\(ID-512080.0](http://www.ijera.com(ID-512080.0)
 - [49][M] The Why Intrinsic SPIN (Angular Momentum) $\frac{1}{2}$ -1, Into Particles. [www.oalib.com\(ID-1102480.0](http://www.oalib.com(ID-1102480.0)
 - [50][M] The Kinematic Geometrical solution of the Unsolved ancient –Greek Problems and their Physical nature <http://www.jiaats.com/paper/3068.ISO 9001>
 - [51][M] The Nature of Geometry the Unsolved Ancient-Greek Problems and their Geometrical solution Error! Hyperlink reference not valid. <http://www.oalib.com/Journal:paper/1102605>
 - [52] E-Geometry, Mechanics-Physics and Relativity, <http://gpcpublishing.com/GPC: volume 4, number 2> journal homepage
 - [53] Material-Geometry and The Elements of the Periodic-Table [www.ijerm.com\(ID-0306031.0](http://www.ijerm.com(ID-0306031.0)
 - [54] The Material-Geometry Periodic Table of Particles and Chemistry. <http://ijemcs.in/>
 - [54] The Material-Geometry A-Periodic Table of Particles and Chemistry. www.iosrjournals.org
 - [55] Material-Geometry, the Periodic Table of Particles and Physics. <http://ephjournal.com>
 - [56] Big-Bang or the Glue-Bond of Space, Anti-space?? (www.TechnicalDean.org)
 - [57] The Eternal Glue-Bond of Space, Anti-space, Chemistry and Physics www.globaljournals.org.
 - [58] Big-Bang or the Rolling Glue-Bond of Space, Anti-space, book@scirp.org,<http://www.scirp.org/>
 - [59] STPL Mechanism is the Energy – Space Generator. <http://viXra.org/abs/1612.0299>
 - [60] The Chaos becomes Discrete through the STPL mechanism which is Energy-Space Generator (<http://www.ijrdo.org/>)
 - [61] The How Energy from Chaos, becomes Discrete Monads. <http://www.ephjournal.net/>
 - [61-A] The How Energy from Chaos, becomes Discrete Monads. <http://www.ijrdo.org/>
 - [62-B] The Geometrical solution of All Regular n-Polygons. <http://www.irjaes.com/>
-

- [62] The Geometrical Solution of All Odd – Regular – Polygons, and the Special Greek problems
<http://www.irjaes.com/>
- [63] The Geometrical Solution of All Odd – Regular – Polygons, the Special Greek Problems and their Nature. <http://www.ijerd.com/>
- [63][A] The Geometrical Solution of The- Regular – Polygons, the Special Greek Problems and Their Nature. <http://vixra.org/>
- [63][B] The Geometrical Solution of The- Regular – Polygons, the Special Greek Problems and Their Nature. (<http://iosrmail.org/>)
- [64][A] The How energy from chaos becomes the $\rightarrow$ Spin, of the Discrete Elementary monads. <http://www.i-b-r.org/.??>
- [64] The How energy from chaos becomes the $\rightarrow$ Spin, of the Discrete Elementary monads: (<http://www.ijrdo.org/>)
- [65] The Spin of monads and their Energy-Stores. www.ajer.org.
- [66] The Energy-Stores in Photon. <http://www.i-b-r.org/.???>
- [67] The Energy Structure of Atoms and Photon. <http://viXra.org/>.
- [68] The Moving Energy - Storages and Photon. www.sfqjp.com
- [69] The Moving and the Stationary Particles. <http://science.MPG>
- [70] The How Energy from Chaos becomes the Spin of Monads and Photon. <http://www.ijrdo.org/>
- [70] The How Energy from Chaos becomes the Spin of Monads and Photon. <http://science.MPG>
- [70] The How Energy from Chaos becomes the Spin of Monads and Photon. www.ijera.com.
- [71] The Gravity and Photons. <http://asir@sholink.org>
- [72] The origin of Gravity and universe. [<mailto:editorusa@globaljournals.org>]
- [72A][M] The Origin of Gravity Gravitational Constant and Universe. <http://saiconference.com/FTC>
- [73][M] Planck's Constant, The Gravitational and Gravity Constant: <https://ijrdo.org/index.php/mce/issue/current>
- [74][M] The Newtonian Constant of Gravitation and Gravity Constant. www.iosr.org
- [75][M] The Newtonian Constant of Gravitation and Gravity Constant. The Physical Interpretation <http://science.MPG>
- [76][M] The Newtonian Constant of Gravitation Gravity Constant, and The Galileo Principia <http://www.i-b-r.org/>.
- [76A] [M] Origination of The Nutation-motion, and Atom-model. <http://www.i-b-r.org/.?>
- [77][M] The Newtonian Constant of Gravitation and Gravity Constant. Their Physical Interpretation.
- [78][M] The Physical Interpretation of Gravity-Constants, Electron and Photon <http://saiconference.com/FICC2020/Submit>

- [79][M] The Planck's Constant and Speed of light. <http://science MPG>
- [80][M] The Origination of the Nutation-motion, the New-Energy-Atom-Model and the United-Coulomb-Newton-Laws for Interaction. <https://www.akinik.com/publishbookchapter/-research>
- [81][M] The Physical Interpretation of Gravity – Constant, Electron and Photon
<http://vixra.org/abs/1906.o468>, <https://www.scribd.com/doc/>
- [82][M] The Physical Interpretation of Gravity – Constant, Electron and Chemistry <http://science MPG>
- [83][M] The EPR Argument and The Quantization of Energy in Spaces <http://www.ajer.org/volume9 issue 1.html>
- [83A][M] The EPR Argument under the Critic of Material-Geometry and Elementary Particles.,
<http://www.ajer.org/volume9 issue 1.html>
- [84][M] The unification of Energy-monads, Black Holes, with Geometry Monads, Black Matter, through Automobile Forces in monads.
- [85][M] Quantization of Points and Potential and the Unification of Energy-Space.
- [86][M][M] The Physical Interpretation of Gravity – Constant, and Applications in Chemistry <http://science MPG>
- [87][M] Photon Particle, Photon Wave or Duality Photon? and Applications <http://vixra.org/abs/2003.0601>
- [87][M] Photon Particle, Photon Wave or Duality Photon? and Future Technologies
<https://www.scribd.com/doc/1/>
- [87B][R] Photon Particle, Photon Wave Or Duality Photon ? An Answer to WHY and HOW is the Objective-Reality www.IJRDO-Journals.org
- [88][M][M] The Origination of Nutation motion and a New Electromagnetic Structure of Atom
<http://science MPG>
- [89][M] The Wave & Particle Duality Photon and Elementary Particles Origination. <http://science MPG> ≡ Markos Georgallides
- [89A][M] The Duality Photon and The Physical Interpretation of Photon Spectrum <http://science MPG> ≡ Markos Georgallides
- [90][M] The New-Structure of Atom, the Nutation-motion and their Application. <http://science MPG> ≡ Markos Georgallides
- [91][M] The Origin of The Fundamental-Particles in Planck's Confinement. <http://science MPG> ≡ Markos Georgallides
- [92][M] The Wave & Particle Duality-Photon and Elementary Particles-Origin. <http://science MPG> ≡ Markos Georgallides
- [93][M] The Fundamental-Particles and the Fundamental-Forces of Nature. <http://science MPG> ≡ Markos Georgallides
- [94][M] The Cosmic-Particles Origination and their Bonding,
- [95][M] The Wave and Particle Duality Photon, Cosmic-Particles-Origin and their Bonding STAIR AWARDS 2021

- [294][M] The Wave & Particle Duality - Photon, Cosmic-Particles Origination and their Bonding
<http://Markos.Georgallides/MPG/>
- [95][M] The How Intensity-Squares of Electromagnetic-Cosmic-Particles follow Quadrature of Square-Prism to Equivalent-Energy-Sphere-Cone, <http://vixra.org/3/> / 2021
- [96]AA The Wave and Particle Duality Photon, Cosmic-Particles-Origination and their Stability In Cosmology < ejas@scholarpublishing.org >
- [97A][M] Duality Photon and the Mechanical and Chemical, DNA-Helix, Construction Functions< ejas@scholarpublishing.org >, <http://science MPG ≡ Markos Georgallides>
- [97B][M] The Duality Photon, DNA, and the Cruise-Missile Elementary-Particles, Conductors, <http://science MPG ≡ Markos Georgallides>
- [98A][M] The Nature of Greek-Special-Problems & their functioning in Electromagnetic Forces In DNA - Conductors, <https://www.lap-publishing.com/>. E-book. LAP LAMBERT Academic Publication.
- [98B][M] The Why, the How and When, the Atoms – Bond. <http://science MPG ≡ Markos Georgallides>
- [99A][M] The How, Why and When, the Atoms – Bond. <https://mts.Intechopen.com.book.process/> ≡ Dragan Miljak
- [99AAA][M]The How, Why and When, the Atoms – Bond. <http://Markos.Georgallides/MPG/>
- [99CCC][M]The 4-Frequencies of Atoms – Bonding related to Octave Periodic-Table.
<http://Markos.Georgallides/MPG/>
- [99][M] The Bonding of Cosmic-Particles and Resonance Photoelasticity, <http://Markos.Georgallides/MPG/>
- [100][M] Programming, The Atoms and their Compounds Energy, <http://Markos.Georgallides/MPG/>
- [101][M] The Why and How Atoms and Compounds Bond, and Chemistry-Programming
- [102][M] The Markos-Method of Conservation of Motion = Energy, by Division.
- [103][M] The Markos-Method of Conservation of Motion in Nature and Medicine.
- [104][M] Programming of Atoms and their Compounds and their Modulated-Energy,
<http://Markos.Georgallides/MPG/>
- [105][M] The ERP Argument, Under the Critic of the Material—Geometry AND, The Space Energy Universe.
- [106][M] Programming the Atoms and Compounds and the Unification of Physics AND Chemistry —- ["JMSEAT - 2024"]atul@scientificadvances.co.in
- [106][M] Programming the Atoms and Compounds and the Unification of Physics AND Chemistry —- ASRP.hspublishing@gmail.com
- [106][M] Programming the Atoms and Compounds and the Unification of Physics AND Chemistry —-.
<http://vixra.org/>
- [107][M] The Planck's << Dual - Angular - Momentum >> as GRAVITY and ANTIGRAVITY < EJAS.office@gmail.com >
- [108][M] The Planar and Atoms Black Holes, Under the Critic of Material-Geometry & Planck–Dual Spin as Gravity-Antigravity <http://science MPG ≡ Markos Georgallides>

-
- [109][M] The DUAL Quaternion Momentum -B as {The Existing Universe} & The Black -Holes, <http://science.mpg.gr> $\equiv$ Markos Georgallides
- [110][M] The Origination-Mechanism of Fundamental Particles in the Energy-Planck's Confinement and their existence, <http://science.mpg.gr> $\equiv$ Markos Georgallides
- [111][M] The Origination of, Matter – Antimatter in the Beyond Planck's-Length Energy-Space-Universe and the nature of Antimatter.
- [112][M] The Quantization of Points and Potential and the Unification of Energy and Space with The Universal Principle of Virtual work, due Geometry.

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