# THE  POLYNOMIALS [ n.. Knots–FIGURES ]
# EDGE - POINTS  VIBRATION & M-GEOMETRY

### BY

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## Abstract

**The Interactions** :

One of the most important concept in Geometry is , *distance* , which is the Quanta in  E-geometry , while in Material-Geometry the composition of Opposite , where the *Material - Point*  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 ± axes pass from zero . In PNS Space , *The* Rolling of the Positive ⊕  constituent on the Negative ⊖  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* **.** *Quaternions*  [(+)↻↺(-)] ≡ Box **B** $_{R=AB}$ carries the Principal  stress $\sigma_A$ , $\sigma_B$ between  Points 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 .** [108 – 110] . Because of the *Revolving and Periodic* acceleration of Gravity  g ≡ ± σ  exists as the First Energy-Box-**B**$_R$ , while in the Second Box **B**$_P$  is followed *the Local-Extreme-case*  where  Gravity g ≡ ± σ , and  is altered Locally by changing the Principal-stress **σ** with an Local-uniform-Pressure → **g**$_L$ ≡ 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**$_L$ σ , such for *Macrocosm and for Microcosm* , Obeying the Newton`s Laws of motion . G ⊥ σ

This Energy in **Hydrogen-Cave** as **E-M , Conductor** ≡ Edge Points Vibration ≡ **The Pin of Atom → Plug Into their Sockets** , which are the  **Orbit – Bracket–Hooks** ≡ The Hands of Atoms ←  **i.e. The Atoms Plug with their Pins** into **the other Atoms-Drains = Holes** , and so Bond and carry Informations **.**

This **Resonance frequency of *Hydrogen is Common to all Atoms*** and to all  Compounds in this Cosmos . The Energy-Quaternion $\overline{w}$, $\overline{B}$, Monad-Magnitudes exist as DUAL- Nature for Any { $\oplus$ , $\ominus$ }, { Position , Motion },{ **Universe** , **Black-Holes** } , { Gravity ,Antigravity} , {Action $\to$ . $\leftarrow$ Reaction} ,  Edge Points Vibration creating Electric = [$\oplus$] and Magnetic = [$\ominus$] Forces as [$\oplus \leftrightarrow \ominus$] ,The Light and others .The STPL- Line Conductors on the **[STPL]- Mechanism** , are the **Physical-Rotors** for the Origination of the Cosmic –Particles which transfer Informations as the Signals - Spectrum .[110]

From Mechanics-Physics , *all Systems Possessing Elasticity $\equiv$ motion and Reaction to the motion ,* the called mass *, are capable of  free vibration  or vibration $\equiv$* **Periodic - motion** *taking Place in the Absence of External Excitation* .This Principle issues for Both Systems **Closed** {The Atoms Nucleus} **or Open** Systems {The Orbitals}. For instance , In order that shifting of an **u-d-**Quarks from an **Anti-Proton** into a Proton , the Spin-Pair  requires extra input of Energy in (MeV) , so that would the **Proton  Paired with a Neutron and be Stable**. transfer Informations as the Signals . **Vibration in a cave** $\Delta$ , *means the Wave Pattern .* **Cave–Spin-$\overline{S}$** of  PNS Space is  $\overline{S} = r\, m\, v$ and is the first **Monad** occupying  **4-Spaces ,** i.e.

From Number **n** , of the Equilibrium number of masses m $_n$ in  a  System.

**a..** The **n -** Spaces of Monad  $\overline{S}$  are the Polygons  $S^n$ with  n = 1 $\approx \infty$ Knots ,

**b..** The **n** Anti-Spaces of Monad - $\overline{S}$  are the Polygons - $S^n$ with **n** =1$\approx \infty$ Knots ,

**c..**  Sub-Spaces of Monad $\equiv$ $\pm \sqrt[n=1-\infty]{\overline{S}}$ are the Polygons with  **n = 1 $\approx \infty$ Knots**

All  n-Regular Polygons End to equations of  n-degree Segment , by finding  a suitable value of  the  Segment , x ,  That is  we have in the general case to solve one or two equations of the form  :  $A \cdot R^0 \cdot x^n - B \cdot R^2 \cdot x^{n-2} + C \cdot R^{n-6} \cdot x^3 - D \cdot R^{n-4} \cdot x^2 + E \cdot R^{n-2} \cdot x^1 - F \cdot R^n \cdot x^0 = 0$

for **The Even Polygons** , and

$A \cdot R^2 \cdot x^{n-2} - B \cdot R^{n-2} \cdot x^{n-3} + C \cdot R^{2(n-4)} \cdot x^3 - D \cdot R^{2(n-3)} \cdot x^2 + E \cdot R^{2(n-2)} \cdot x^1 - F \cdot R^{2(n-1)} \cdot x^0 = 0$

for **The Odd Polygons** ,    where  A , B , C , D  are constants .

The  Presented Geometrical method is the solution of the above equation in the general case . Because , the  nth - degree - equations  are  $\to$ the Vertices (**n**) and the Sides (**a$_n$= λ$_n$**) of the n-Polygon in circle $\leftarrow$  number  , $\pi$ , is their common Mould . [ 62 ] . The Natural Mechanism Continuously Originates the Elementary Particles and Compounds , Atoms and Molecules with the  One Action from Opposite . Article  [111]  encloses many Paragraphs of [110] , in order to Distinguish and Prove the Way of  Energy and the Stresses- Paths in the Spaces . For the Regular Polygons is given such the  Geometrical Solution as well the Algebraic . [106] = Programming the Atoms and Compounds , is **an Program** which solves the Problem of the **n-Knots Figures**  and gives the **Energy Spectrum** of  any **Complex-Forced-Vector** . Article  [114]  an Way of Deceptioning the Cells is prepared .

*Keywords* **:**  The Figure  n-Knots , The Polynomials n-Knots  , Spaces and Figure  n-Knots , The  Waves of  Spaces .

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

CONTENT

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

## 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 OF E-GEOMETRY .

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

$$\downarrow \qquad\qquad A \qquad C \qquad B \qquad A \qquad C \qquad\qquad B$$

$$CA + CB \;=\; AB \quad , \text{ where } , \qquad \square \qquad \square \qquad \square \qquad \underline{\square}\underline{\quad} \; \square \;\underline{\qquad\quad}\underline{\square}\underline{\quad}$$

$$\text{F.1(a)} \qquad\qquad \text{F.1(b)}$$

**ds** = An Infinitely small increment of length AB in the direction $\overrightarrow{AB}$ or $\overleftarrow{BA}$ .

$\infty$ = 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 $\overrightarrow{AB}$ , $\overleftarrow{BA}$ , $\overrightarrow{AB}$ ) and **the Dimension** ( which is the Magnitude N such that N = 0 $\rightarrow |AB| \rightarrow \infty$) , and when exists ,

A = B        =        The *Principle of the Equality* .

A $\neq$ B        =        The *Principle of the Inequality* .

A$\rightarrow\leftrightarrow\leftarrow$ B = $\infty$ The *Principle of Virtual Displacements* . $\mathbf{W} = \int P.ds = 0$ , **ds** $= \partial W / \partial P$

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

$\overrightarrow{PA} + \overleftarrow{PB} = 0$  The *Principle of Stability*

$\overrightarrow{PA} + \overleftarrow{PB} >< 0$  The *Principle of Motion* .

**2a2.. The Monads = Quantum = $\overrightarrow{ds}$ = AB / ( n $= \infty \to 0$ ) $= [ a \pm b\,i ] = 0 \to \infty$** , 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 x $10^{-35}$** m , 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 = $1x10^{-N} < \infty$** , 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 $\infty$ 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 $\infty$ 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 $\infty$ Elements are the Points on the circle , *and for 3D-Space , the Points on Sphere* N.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 $\infty$ Spaces of **Unit AB** is Sector AB $\leftrightarrow$ , and in Sub-Spaces the $\infty$ 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 $\to \infty$ 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*

5

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

*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 ≡ 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 → ds = 0 → P = ∞**)**

> Impulse **P** = ∞ *, 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 → ∞ ,** ( A ≡ 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]

> **The Unique Case** *where P = 0 and Δs > 0 = AB → ∞ is the Primary Planck`s*
> *Space* **[ PS ]** *The Spherical connection of the same Points in PS , is related on*
> *the influence* **(** *P = 0 →* $\overrightarrow{AB}$ *→ ∞***)** *of the infinite ( ∞ ) Equilibrium Primary-Spaces*
> *and Anti-Spaces .* For every Point in [ **PS** ] 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 → ∞ . It has been also shown that ,

Every Point **M** of Primary Planck`s Space **[ PS ]** exists in this Space with a **deficit of Impulse P = 0 → ∞ ,** due to the influence of the other Equilibrium Primary Spaces **.**

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**The Unique  Case** *where P = 0  and  Δs = 0 → 0  is the Primary Neutral  Space* **[ PNS ]**
*The* ⊕ *Material Point* ≡ The Space , continually Rotates around *The* ⊖ *Material Point* ≡
The Anti-Space , on 2R circle . [PNS] Space is a

**This  Property  of Points  in Neutral  Space** *is  the cause of their Continuously  Survive .*
The Quantization  of  Points **becomes  through  Vector  Unit  dš** = |**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 (d P) , are connected on***| **AB**|,
*So  at any  Point  M  exist the Centripetal force of* two  **Opposite** [⊕↺↻⊖] .***All  Points  of***
**[PNS]** *are* **Homogenous** ( *i.e. all Points of*  PNS  *Space  are Equivalent* ≡ )  and  **Isotropic**
( *i.e. all  directions ,* ⇉ , *of*  AB  *are  Equivalent* )  → **[ A ≡ 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 ]
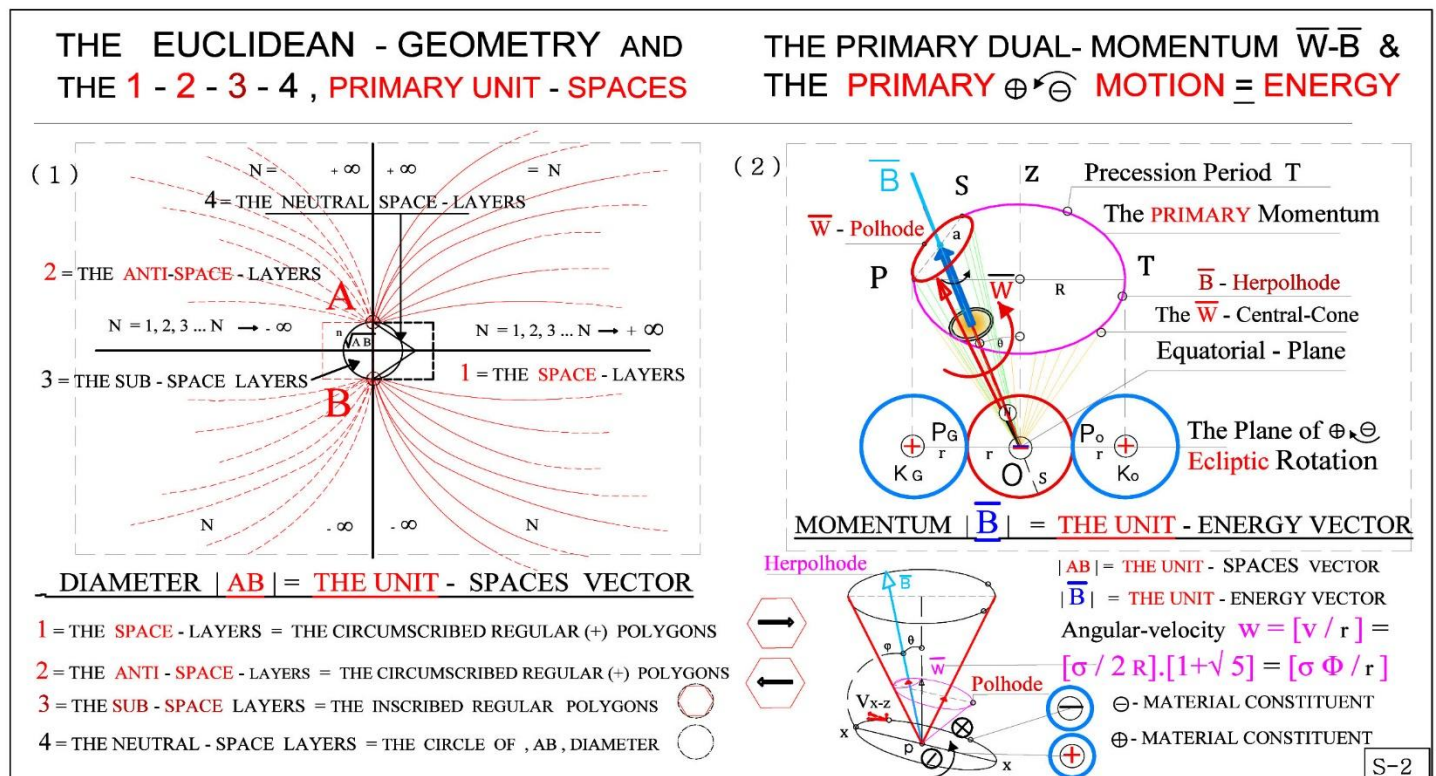


**Figure – 1 .** The **4-Primary-Spaces** of Euclidean-Geometry and the **Primary Rotational**
Quantized motion ≡ The Unit-**Angular-Momentum**-Energy in **PNS** Spaces .

### 3a… THE   QUANTIZATION   OF THE → { ENERGY – SPACE  UNIVERSE  } ←

In a Conservative System the Total **Energy ≡ 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

7

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

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 . Newton`s second law is the first basis for examining the motion of a Free – Vibration in a System . When the Deformation of a Spring in the Static - Equilibrium  Position is $\Delta$  and the Spring force  $k.\Delta$ equal to the gravitation al force **mg** , then issues   $k.\Delta = mg$  …. (a) Applying Newton`s second law to the mass **m** , or mass can be replaced by a mass Moment of Inertia denoting the Resistance to  motion $\Delta$ , and then  $m\ddot{x} = - k x$  for an  x – x axis . The Natural – Period of the oscillation is established from relation $w_n T = 2 \pi$  where issues  [7]

$$T = 2 \pi \sqrt{\frac{m}{k}} \quad , \quad f_n = 1 / T = \frac{1}{2\pi} \sqrt{\frac{k}{m}} \quad , \quad f_n = 1 / T = \frac{1}{2\pi} \sqrt{\frac{g}{\Delta}} \quad …….(b)$$

i.e. The Kinetic Energy $E_K$  is applicable in a Single - DOF System including Rotation . Since Issues $E_K = E_P$  so and   $E_K + E_P = $ 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 = $w_n$  and the

equation of motion is $\rightarrow \ddot{x} + w^2_n x = 0 \leftarrow$ where  $w^2_n = \frac{k}{m}$ , 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  $w_H = \sqrt{\frac{k}{m_H}}$ . or and frequency  $f_H = \frac{w_H}{2\pi}$ ,  and is a **Wave –**

**function** providing the complete Description of the **Physical Reality** . From ,  Work = **W = Force - $F_{i,j,k}$** x **Displacement $ds_{i,j,k}$** = ( $F_{i,j,k}$ x  $ds_{i,j,k}$ ) = ( F x ds ) **,** and for the Unit of time  **dt** ,  $\rightarrow$  W / dt = F x ( ds / dt ) = ( F x $\overleftrightarrow{v}$ i , j , k ) =  **Power = P .**

  **i.e.  Power $\equiv$ Force x Velocity or  (  $P = F \times \overleftrightarrow{v}$  )**

  Remarks , from Mechanics - Physics   :

1…Energy  $E = \frac{1}{2} m_H . c^2$ ,    or  $\rightarrow 2E = m_H . c^2 \leftarrow$ and  Velocity = The light-velocity **c** ,

2…Wave length  $\lambda_H = \frac{2\pi c}{w_H}$ ,  **and**  Wave Amplitude  $A_H = \frac{\lambda_H}{2\pi}$ ,

3…Hydrogen Power   $P_H = 0,5. m_H . [ A_H ]^2 . [ c ]^2$

4…The Hydrogen Stress-Vector $\sigma_H$  is related to  **c**  as **,**  $c = \Phi . \sigma_H$

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 $\equiv \pm$ SPIN $\equiv$** [Gravity and Antigravity] *because* the light velocity $\bar{c} = [\frac{G \Phi}{A}]$ ,

8

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

and Precedes  that of  A-Momentum $\Rightarrow$ **B** = r m **c̄** . Exists Vector B $\perp$ r-c  Plane .

8…Since Angular-velocity $|\overline{w}|$ , *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 ,** $\overline{B}$ & $\overline{w}$ **, and W $\equiv$ Motion** are Stabilized in the **DUAL – TYPE** , such  in **Microcosm ,** as in **Macrocosm ,** or Both as **Omnipresent .**

**1…The DUAL-Momentum** $\overline{B}$ & $\overline{w}$**,** 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 - Wave }.**

**3…The DUAL - Spin** $\overline{B}$ , as **Real** $\equiv$ **Space** $\equiv$ **Gravity** and, **Imaginary** $\equiv$ **{ Anti - Gravity }.**

**4…The DUAL – Matter** $\overline{B}$ , as **Real** $\equiv$ **Space** $\equiv$ **Atoms** and, **Imaginary** $\equiv$ **{ E** $\Rightarrow$ **M -Wave }.**

**5…The DUAL-Refraction of Energy** as **Real** $\equiv$ **The Space** angle $\varphi$ , **Imaginary** $\equiv$ $\overline{v}_1$, $\overline{v}_2$

**{ The Energy** $\equiv$ **W** from the different velocities , $\overline{v}_1$, $\overline{v}_2$ **}.**

    <u>**The Results in  Hydrogen - cave  :**</u>

1…Hydrogen-**Cave** , IN – OUT Universe occupies **mass m** $_H$ **, velocity** $\overrightarrow{c}$ **,** 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→ **Stress Energy** as **Hydrogen-Bracket-Hook**← The Electron  **Precesses** from the continuous and immense-communication to **gravity**, **g** . Electron-Spin is the **Angular-momentum-vector** $\overline{B}$ and rotates according to equation $\frac{dB}{dt}$

3…The Stationary → **Tetrahedron , In-Sphere , Cube , Ex-Sphere** ←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 any time by the Bioelectronic-Spectrum of →{ **Carrier-Modulating-Modulated , Demodulation Process Mechanism }** ← using Markos Program **< Programming Atoms-Bonding and Their Compounds > SO** , Energy $\equiv$ motion is of **Wave nature** which enters the **Energy caves** and becomes  a **Particle or Wave or Both** . In case of **Photons** exists this DUAL-Property , **Wave – Particle** . Thus The Historical Doubt of **Einstein - Podolsky - Rosen** for the Q-Mechanics Completion **VANISHES  .** [100,104] .

5… **The** Programming of Atoms Bonding is the Quantization of *Atoms -Wave -Energy* to all Possible  Equilibrium Positions of the [$\oplus$↔$\ominus$] 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** times 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

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

Status using the → **Carrier–Modulating–Modulated–Demodulation Waves Process** ←

   **Some following Wave Properties that are Defined** :

6a... The Equilibrium  Mode – Shapes , $\Phi$ , Diagrams .

6b1..The Circular – Frequencies , $W_R$ , in $10^{15}$ Hz ,

6b2..The  Natural – Frequencies  , $f_R$ , in  $10^{15}$ Hz ,

6c.. The Resultant Energy – State , $E_R$ , in e-Volt ,

6d...The Electric–Magnetic Field  , $E_R$ - $M_R$ , in $10^{-12}$ Ampere -$10^{-6}$ Tesla ,

6e.. The Intensity of the  $\lambda$-Electric–Field  , $I_\lambda$ , in $10^{-12}$ Ampere ,

6f.. The Intensity of Magnetic–Field  , $M_\lambda$ , in $10^{-6}$ Tesla ,

6g.. The Wavelength  , $\lambda$ , in $.10^{-10}$ meters ,

6h.. The Wave Velocity  , $\bar{v}$ , in $10^5$ meters / s ,

6i1..The Resultant Voltage at Wavelength-sides , $V_\lambda$ , in Volt ,

6i2..The S-Bands Voltages at Wavelength-sides , $V_\lambda$ , in Volt ,

6j.. The Radius of the Helical motion , $r = A_R$ in $.10^{-10}$ meter ,

6k.. The Total  Carrier Power , $P_{CT}$ , in $10^{-20}$ Watt ,

6l.. The Total  Side-Bands Power , $P_T$ , in $10^{-20}$ Watt ,

6m.. The Side-Bands Amplitude , $A_B$ , in $10^{-10}$ meter ,

6n.. The Side-Bands Coefficients , $a$ - $m$  , in  n-n ,

6o.. The Modulating  Phase Shift  , $\varphi$ , in  Rad $/2\pi$ ,

6p.. The Modulating  Factor , $m$ , in n-n ,

6q.. The Total Energy-Status , $a$ - $m$  , in H-W ,
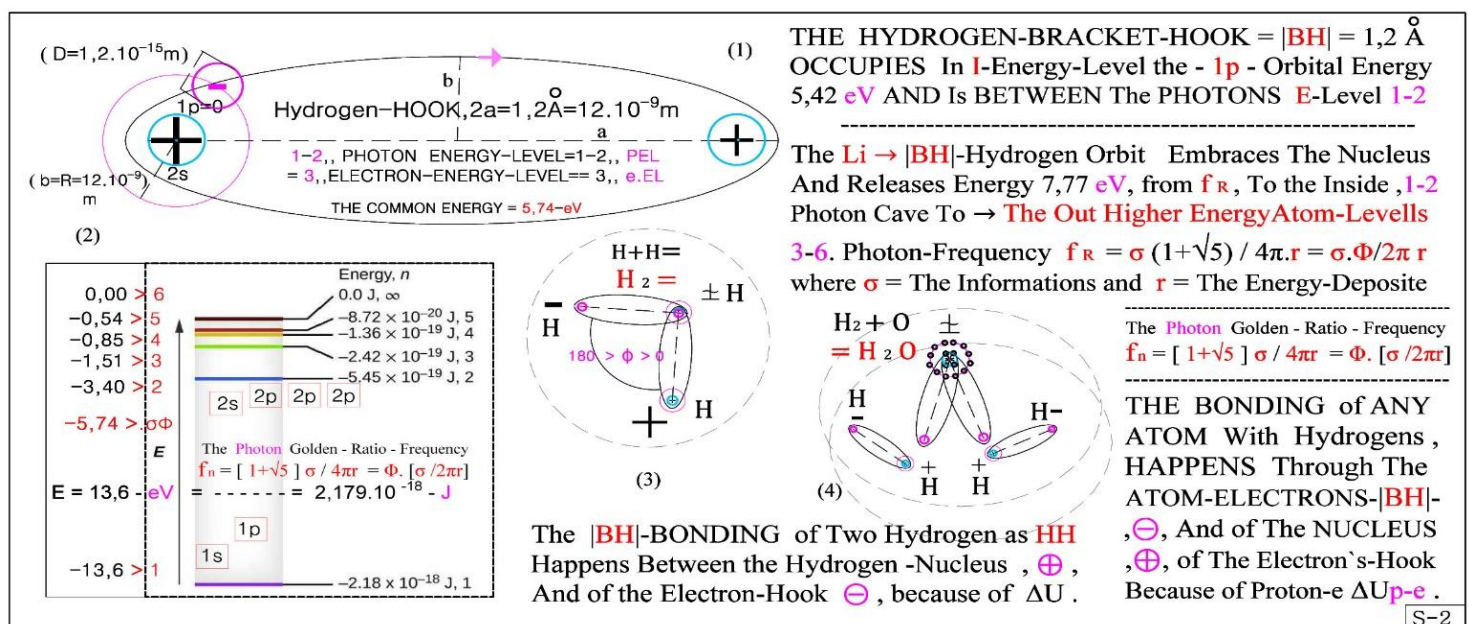


**Figure-2..**  The  $\pm$ Energy in Hydrogen and Atoms exists from Hydrogen Common-Atom .

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

The two Hydrogen Bonding $\rightarrow$ $H + H = H_1^1 + H_1^1 = H_1^{1-1} H_{1-1}^1 = H_1^0 + H_0^1 = H_2$

Water $H_2O = O_1 H_2 = O_2^2 H_2^2 = T_4^4 = O_2^{2-2} H_{2-2}^2 = O_2^0 H_0^2 = ES_{2=T/2}^{2=T/2}$ , Still. [102]

## 4a.. THE  CORELATIONS  OF SPACES  AND  THE PRIMARY MOTION .

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

**The Position of Spaces** is defined from any 3-dimension Coordinate (x , y , z) or from 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 the **magnitude |OP|** = $\vec{n}$ |OP| , where $\vec{n}$ is **The Unit Line - length** direction and is identified by vector $\overleftrightarrow{n}$ ≡ |AB| = **The Unity Monad** .

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

1… For Spaces , the Polygon Side is $\lambda_{n(S)} = 2 \cdot \sqrt{R^2 - a^2_{n(S)}}$ ,

2… For Anti-Spaces , the Polygon Side is $\lambda_{n(AS)} = 2 \cdot \sqrt{R^2 - a^2_{n(AS)}}$ ,

3… For Sub-Spaces , the Polygon Side is $\lambda_{n(SS)} = 2 \cdot \sqrt{R^2 - a^2_{n(SS)}}$ ,

4… **For Neutral - Spaces** , the Polygon Side is $\lambda_{n(NS)} = 0$ , while in **Material-Geometry** becomes from the Centripetal Force $F_C = \sigma = \frac{m.v^3}{r} = J w^2 r$ , where the Unity Monad r ≡ monad $R = \frac{\sigma}{J.w^2} = \frac{\sigma}{B} = \frac{Stress}{Angular-momentum}$ , and Polygon Side $\lambda_{n(NS)} = 2\sqrt{R^2 - a^2_n}$ , All becoming from Pythagorean relation $[R]^2 = [a_n]^2 + [\frac{\lambda_n}{2}]^2$ .

**In Fig-3** , is shown the Geometrical construction of the Inscribed and the Circumscribed **n**-Regular Polygons . With 4 , 5 , 6 , different Vibrating masses for each Space and by using the Argand Diagram for a Vector of Amplitude AB = 2R = The Monad , then the 4 - Spaces are measured using the Euler equation for exponential functions as follows ,

On the  SPACES , the **Vector of Amplitude** can be represented as the **Complex quantity**

on $\rightarrow$ S $\Rightarrow$ $Z_+^n = +2R.e^{i.n\omega t} = +2R^n.[\cos w.t + i.\sin w.t] = x + i.y$

on $\rightarrow$ AS $\Rightarrow$ $Z_-^n = -2R.e^{i.n\omega t} = -2R^n.[\cos w.t + i.\sin w.t] = x + i.y$

on $\rightarrow$ SS $\Rightarrow$ $Z_\pm^{1/n} = \pm 2R^{1/n}. e^{i.\theta/n} = \pm \sqrt[n]{2R} \cdot \sqrt[n]{[\cos w.t + i.\sin w.t]} = x + i.y$ where

The **Space Vector**–Amplitude $2R = \sqrt{\lambda_{n(S)}^2 - a^2_{n(S)}}$ , for the n-masses .

The **Anti-Space Vector**–Amplitude $2R = \sqrt{\lambda_{n(AS)}^2 - a^2_{n(AS)}}$ , for the n-masses .

The **Sub - Space Vector**–Amplitude $2R = \sqrt{\lambda_{n(SS)}^2 - a^2_{n(SS)}}$ , for the n-masses .

11

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**Remarks** :

**a…**From Argand Diagram the Vector $Z_+^n = 2R.e^{i.n\omega t} = +2R^n.[\cos w.t + i.\sin w.t] = x + i.y$
meaning the **Wave Pattern of Spaces** in Planck`s cave $10^{-35}$ m .The Vector Amplitude
$\overline{AB} = 2R$ = The Monad ,is the Complex quantity $\overline{AB} \equiv \bar{z} \equiv x + i.y$ , where $x = 2R \rightarrow$ the
**Geometry of PNS - Space** and $y = e^{i.n\omega t} \rightarrow$ the **motion in Planck`s Space** .

**b…**Since Anti-Space $Z_-^n \equiv - Z_+^n$ , means the **Conjugate Space** to the Space $Z_+^n$ .

**c…**Since from **Wave-Action of Spaces** issues $Z_-^n \times Z_+^n = [2R]^{2n}.e^{i.2n\theta}$ , this means
that ,The **conservation of Energy** = **Work** , between the Spaces and the Anti-Spaces
happens by doubling the number , **n** , of the Vertices of the Regular Polygon .

**d**... The Natural frequency of an **x-x** linear vibration , $[\oplus\leftrightarrow\ominus]$, becomes from $w_n = 2\pi.f_n$
meaning that the infinite frequencies $f_n$ are stored in Subspaces by doubling the
number , **n** , of the Vertices with 2n-Sides to a Regular Polygon of initial n.Sides .

**e**... The Natural frequency of an Rotational ↻ **r** ↺ DOF vibration System becomes from
$\overline{B} = r.m.v_n = r.m.v_n = r.m.w_n.r = m.w_n.r^2 = m.r^2.w_n$ , meaning the **Natural Identities
of the** ∞ **Monads** in our Universe .

The Equations of motion in a Material Point related to the Inner motion was referred before
where the In-between-magnitude Circumscribed – Inscribed Polygon , **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 $f_n$ , which motion ≡ Growth ,
and Spread in Two-Closed-Transverse Planes as is in the Propagating Electromagnetic Wave

where $E \perp H$ . From Planck $E = h.f_n \equiv [\frac{1+\sqrt{5}}{2}]\frac{h\sigma}{2\pi r} = [\frac{n\sigma}{8\,r^2}].\overline{B}$ , $f_R \equiv [\,f_{1=N},f_2,f_3,f_R = w^2{}_N\,]$ ,

Euler`s $e^{-i.A(\frac{\pi}{2}+2k\pi).b} = e^{-i.A(\frac{\pi+4k\pi}{2}).b} = A.\cos[\frac{\pi+4k\pi}{2}].b - i.A\sin[\frac{\pi+4k\pi}{2}].b$ , $L = [\,\overline{B}/2\,].w$ ,

so then $w = \sqrt{2\pi.f_R} = 2L / \overline{B}$ , and the Wave Equation is $y = 2A.\sin(\frac{2\pi.x}{\lambda}).\cos.wt$ ....(a)

**f**... The Natural frequency of the **Unit-Energy-Vectors** , $\overline{B}.\overline{w} = m.r^2.w^2{}_n = m.v^2{}_n = KE$ .

From Momentum $\overline{B} = r\,m\,v = m\,\breve{w}\,r^2 = \pm[\frac{\pi.r^2}{2}].\bar{c} \times \bar{r}$ , $\overline{B}.\breve{w} = \pm[\frac{\pi.r^2}{2}].\bar{c}^2$ , $\bar{c} = \sigma\,\Phi$ , **i.e.**

**The Primary Space is Originated** from the **Stress** $\Rightarrow \sigma$ , and from the **Angular
Momentum** $\Rightarrow \overline{w}, \overline{B}$ , **Produced** from the **Two - Opposite** $[\oplus\leftrightarrow\ominus]$ components.

**g**...Since Monads are Complex quantities as $AB \equiv \bar{z} \equiv x + i.y$ , then are Quaternions where
Material-Points ≡ Quaternions , which **Carry the** → **Motion ≡ Energy** ← **from** the two
Edge-Poinds [ $\overline{A}\leftrightarrow\overline{B}$ ] **, as this is from Point** A , **to Point** B circularly . Simultaneousley
On AB Conductor is created an **Electric Field** $E_F$ between A–B Points and $\perp$ on AB axis
directed to the motion , and an Transverse ($\perp$AB) **Magnetic Field** as , $M_F \perp \overline{AB} \perp E_F$ .

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

### 5a.. The Figure-eight Knot & The Figure $n = 1 \approx \infty$ Knots :
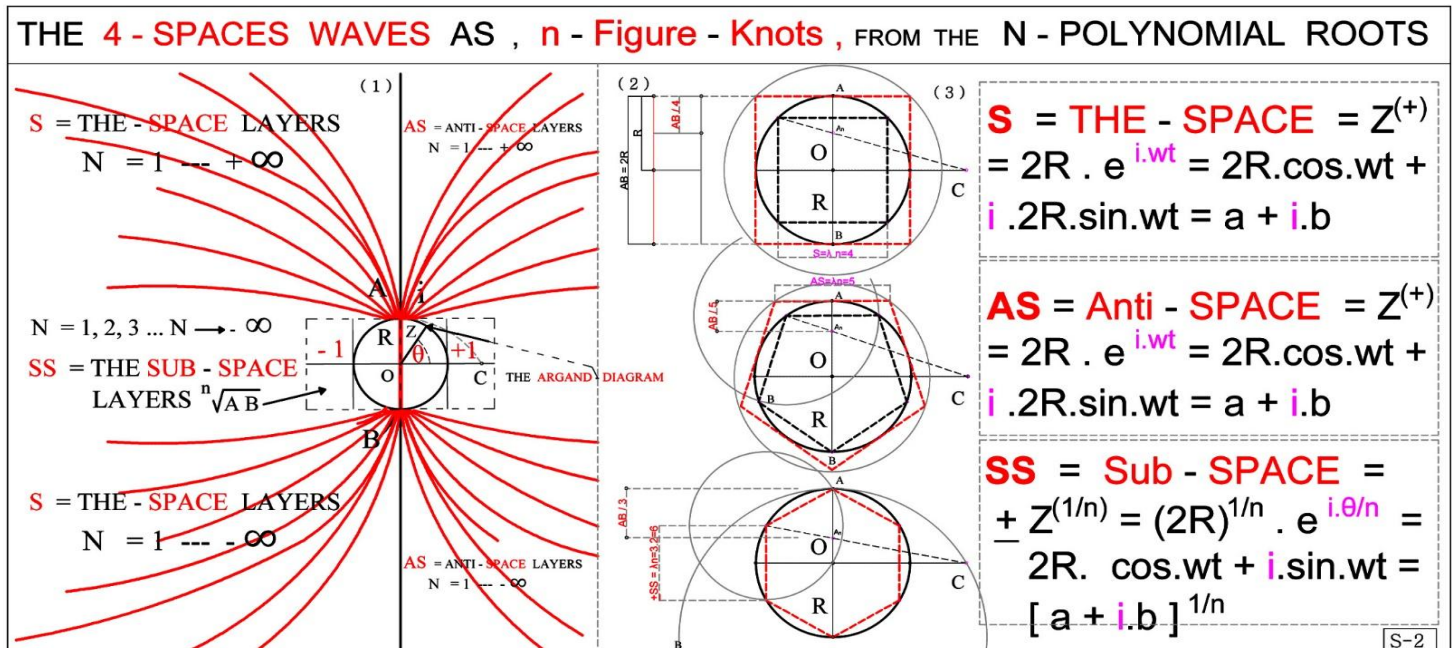


**Figure -3- :** The Geometrical **construction of the 4-Spaces** and the , **Spaces Waves** of PNS .

In Argand Diagram $AB = 2R \rightarrow x = -1 , O , +1$ , $y = i$ , exist the **Vector of Amplitude**

$\bar{z} \equiv x + i \cdot y$ , with angle $\theta° = [Z - OC]°$ , $[i = \sqrt{-1}] \cdot x$ . The **Wave's " strength "** and

**" direction "**, where **x** is a number that represents the magnitude or length of the vector **z** ,

and from Definition of the **complex Vector Space ,** is the **Set of Vectors of length** (the **n**

Vertices which form the **n** Polygon Sides , or the Norm of the Complex-Vectors )

In (1) , (2) , are the 4-Geometrical Spaces consisting the **Geometrical - Mould** .

In (2) , are the **Vectors of Amplitude** ON the 4 -Spaces consisting the **E-Form-Mould** .

It is constructed **in Space** → The Inscribed and the Circumscribed to the circle

of diameter AB , the → **Regular Tetra Pleuron** ←

It is constructed **in Anti-Space** → The Inscribed and the Circumscribed to the circle

of diameter AB , the → **Regular Penta Pleuron** ←

It is constructed **in Sub-Space** → The Inscribed and the Circumscribed to the circle

of diameter AB , the → **Regular Hexa Pleuron** ←

In (3) , are the **Norm** (magnitudes) of the **4 -Vectors** consisting the **Strength -Mould** .

In Fig-3 The time-harmonic function $\bar{z}(t) \equiv$ **Wave** , x is the amplitude, w the angular

frequency , and Phase of $\bar{z}(t)$ to be determined by the number **n** , **n+1** of Vertices .

The **complex – Vector** $\pm \bar{z}(t)$ uses the **Norm** $|\bar{z}| = 2.R$ , and the number **n** , of the

Space which Determines the Number of Knots and Sides of Regular Polygons as ,

13

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

1…The Space is consisted of 4 masses [99] which Produce the **Space - Wave** = 2R.$e^{i.n\omega t}$ ,

2…The Anti-Space is consisted of 5 masses Producing the **Anti-Space–Wave** = - 2R.$e^{i.n\omega t}$

3…Sub-Space is consisted of 6 masses Producing the **Sub-Space–Wave** = $\pm$ 2R$^{1/n}$. $e^{i.\theta/n}$

### 5a1.. The Physical notion of the Regular Polygones : [ 62 ]

According to Archimedes , *Geometric means* , speaking of numbers , *whether solid or square* , observes that , Between Plane One - mean suffices , but to connect two solids two – means are necessary .This denotes that between two square numbers there is one mean proportional number and between two cubes there are two means proportional numbers .

It was Proved that Odd numbers become from any two consequent Even numbers , so the sum of two irrationals may be either rational or irrational . The *Cattle – Problem* of Archimedes may be further analyzed reaching to equations of any degree.

It was shown before that , all n-Regular Polygons End to equations of n-degree Segment , by finding a suitable value of the Segment , x , That is we have in the general case to solve one or two equations of the form :

$$A . R^0. x^n - B . R^2. x^{n-2} + C . R^{n-6}. x^3 - D . R^{n-4}. x^2 + E . R^{n-2}. x^1 - F . R^n. x^0 = 0$$

for The Even Polygons , and

$$A . R^2. x^{n-2} - B . R^{n-2}. x^{n-3} + C . R^{2(n-4)}. x^3 - D . R^{2(n-3)}. x^2 + E . R^{2(n-2)}. x^1 - F . R^{2(n-1)}. x^0 = 0$$ for The Odd Polygons , where A , B , C , D are constants .

The Presented Geometrical method is the solution of the above equation in the general case . Because , the nth - degree - equations are $\rightarrow$ the Vertices (**n**) and the Sides (**a$_n$**) of the n-Polygon in circle $\leftarrow$ so number , $\pi$ , is their Mould .

The Knot is a Closed – Curve in Space ( x , y , z ) , that does not intersect itself .

A simple Parametric representation of the Figure-eight Knot is as the Set of all ( x , y , z )

Points where , **x** = ( 2 + $\cos 2t$ ). $\cos(3t)$ , **y** = ( 2 + $\cos 2t$ ). $\sin(3t)$ , **z** = $\sin(3t)$ ,

**For the Cave-Spin** , $\bar{S}$ = **r m v ,** which is **a Monad** and is consisted **of 4-Spaces** exists

$\rightarrow$ (( The Spaces **n.$\bar{S}$** Polygons , The Anti-Spaces - **n.$\bar{S}$** Polygons ,

The Sub-Spaces $\pm\ ^{n=1-\infty}\sqrt{\mathbf{n.\bar{S}}}$ Polygons )) $\leftarrow$ , with **n = 1 $\approx$ $\infty$ Knots**

It has been Proved [62] that , Projecting the vertices of the Regular n-Polygon on

any tangent of the circle , then the Sum of the heights **y**$_n$ is equal to , n $*$ R .

This is a linear relation between Heights , h , and the radius of the circle , *the monad* .

This Property on the circle yields to the Geometrical construction ( As Resemblance Ratio of Areas which is controlled ) and the Algebraic measuring of the Regular Polygons as follows,

when : **R** = The radius of the circle , with a random diameter I**AB** I .

**a$_n$** = The side of the Regular **n** -Polygon inscribed in the circle

**n** = Number of Sides , a , and Knots of the n -Polygon , then exists :

14

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**n . R = 2 . R + 2 . y1 + 2 . y2 + 2 . y3 +……… 2 . $y_n$** …………. **(n)**

The heights $y_n$ are as follows $y_B = [\,2 . R\,]$ , $y_1 = [\,4.R^2 - a^2\,]\,/. \,(\,2\,R)$ **…(y)**

Equation (y) is a Space-Wave depended on $a_n$ , meaning **n** Informations on $y_B$ Height .

$y_2 = [\,4.R^4 - 4.R^2.a^2 + a^4\,]/(2.R^3)$

$y_3 = \dfrac{[\,8.R^6 - 10.R^4.a^2 + 6.R^2.a^4 - a^6\,] - a^2 . \sqrt{64.R^8 - 96.R^6.a^2 + 52.R^4.a^4 - 12.R^2.a^6 + a^8}}{2.R^5}$

$y_n = [\,……………..\,]\,/\,2.R^n$        **Figure – 3A-**

**In Fig-1-1** , **On AB** Diameter = **2R = The Monad** of Neutral-circle exist

the Spaces with their Sides $\lambda_n = 2,\sqrt{R^2 - a^2{}_n}$ , and their Critical-sides

$a_n = \dfrac{1}{2}\sqrt{4R^2 - \lambda^2{}_n}$ , as below

1… For Spaces , the Polygon Side is $\lambda_{n(S)} = 2 . \sqrt{R^2 - a^2{}_{n(S)}}$ ,

2… For Anti-Spaces , the Polygon Side is $\lambda_{n(AS)} = 2 . \sqrt{R^2 - a^2{}_{n(AS)}}$ ,

3… For Sub-Spaces , the Polygon Side is $\lambda_{n(SS)} = 2 . \sqrt{R^2 - a^2{}_{n(SS)}}$ ,

4… **For Neutral - Spaces** , the Polygon Side is $\lambda_{n(NS)} = 0$ , while in **Material-Geometry**

becomes from the Centripetal Force $F_C = \sigma = \dfrac{m.v^3}{r} = J\,w^2\,r$ , where the Unity Monad r

$\equiv$ monad $R = \dfrac{\sigma}{J.w^2} = \dfrac{\sigma}{B} = \dfrac{Stress}{Angular-momentum}$ , and Polygon Side $\boldsymbol{\lambda_{n(NS)}} = 2\sqrt{R^2 - a^2{}_n}$ ,

All becoming from Pythagorean relation $[\,R\,]^{\underline{2}} = [\,a_n\,]^{\underline{2}} + [\,\dfrac{\lambda_n}{2}\,]^{\underline{2}}$ .

**5a2 .. The General Equations of motion** in a **Polygon-Vector–Conductor** d = Side $\boldsymbol{\lambda_{n(NS)}}$

The Displacement at Point **x** of a Conductor **d** , is x + dx and Strain will be u + ($\dfrac{\partial u}{\partial t}$).dx , and

the Unit Strain is ($\dfrac{\partial u}{\partial x}$) . From Hook`s law , $\sigma = E\,u$ , The ratio of **Unit-Stress** to **Unit-Strain**

is equal to the `modulus of Elasticity E and A = the cross section area of the Conductor , then

issues $\dfrac{\partial u}{\partial t} = \dfrac{Force}{A.E} = \dfrac{F}{A.E}$ and by differentiation becomes $\rightarrow$ **A .E.** $\dfrac{\partial^2 u}{\partial x^2} = \dfrac{\partial E}{\partial x}$ …….**(1)**

Applying Newton`s law of motion for the element **dx** and equate the Unbalance-force $\dfrac{\partial P}{\partial x}$ , to

the Product of the mass and acceleration of the elements , and then $\dfrac{\partial E}{\partial x}\,dx = \rho\,A\,dx\,\dfrac{\partial^2 u}{\partial t^2}$ ….**(2)**

Eliminating $\dfrac{\partial u}{\partial x}$ then we have The Partial differential equation $\dfrac{\partial^2 u}{\partial t^2} = [\dfrac{E}{\rho}]\,\dfrac{\partial^2 u}{\partial x^2}$ ….**(3)** and

$\dfrac{\partial^2 u}{\partial x^2} = [\,\dfrac{\rho}{E}\,] . \dfrac{\partial^2 u}{\partial t^2} \equiv [\,\dfrac{1}{c^2}\,] . \dfrac{\partial^2 u}{\partial x^2}$ …**(4)** where $\bar{c} = \sqrt{\dfrac{E}{\rho}}$ , and it IS The velocity of Propagation of

the Displacement dx , along the Conductor or $\rightarrow$ is **The Stress–Wave** $\leftarrow$

Applying equation (4) in an Conductor [ **d** $\equiv \lambda_{n(NS)}$ ] of Space Anti-Space Equilibrium

formation of Polygon STPL line with both ends Free , then the Natural - frequencies must

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

be zero because charges $\oplus$ , $\ominus$ interchange at both ends , A , $K_A$ , and issues $\frac{\partial u}{\partial t} = 0$ such at $x = 0$ , and as at , $x = d = \lambda_{n(NS)} = AK_A$ . The Two equations of the below (5) correspond to these , *Stretched $\equiv$ linear* , boundary conditions which are as follows ,

$$\{ \frac{\partial U}{\partial x} \}_{x=0} = A \frac{1}{c} [\text{C sin wt + D cos wt}] = \mathbf{0}$$
$$\{ \frac{\partial U}{\partial x} \}_{x=0} = \frac{w}{c} \cdot [\text{ A cos } |\frac{w.AK_A}{c}| \text{ - B sin}|\frac{w.AK_A}{c}| ] \cdot [\text{ C sin wt + D cos wt }] \quad \dots (5)$$

Equation (5) must be true for any time $t$ , Therefore from the First equation $\mathbf{A = 0}$ . From the Second equation $\mathbf{B}$ must be finite in order to have vibration and is satisfied when , $\sin |\frac{w.\ AK_A}{c}| = 0$ , or , $|\frac{w.n.\ AK_A}{c}| = |\frac{w\ n\ d}{c}| = \frac{2.n\ \bar{v}}{c} = \boldsymbol{\pi, 2\pi, 3\pi, \dots n\pi}, \dots (6)$ where , $\mathbf{n}$ = The order of the mode and the equation of motion In Conductor becomes $d = \lambda_{n(NS)} = AK_A$ which is an longitudinal-vibration $\mathbf{u = u_0 \cos [\frac{n\ \pi}{d}]\ x\ \sin [\frac{n\ \pi}{d}] \cdot c}$ ..(7) a Cosine-Wave having $\mathbf{n}$ nodes in Pipe $\mathbf{d}$ .

The equation of motion for an **Longitudinal wave** in a Conductor $d = \lambda_{n(NS)} = AK_A$ is $\rightarrow \mathbf{y(x ,t) = N. \sin [ kx - wt + \varphi ]} \leftarrow \dots (8)$ where , $\mathbf{c}$ = the light velocity-vector , $\mathbf{N}$ = the amplitude , $\mathbf{w}$ = the angular velocity-vector , $\boldsymbol{\varphi}$ = The Phase angle , and $\mathbf{k} = \frac{2\pi}{\lambda} = \frac{\pi}{r_L} =$

Propagating-Energy Constant =Wave-number , $\lambda$ =The Wave length , $\bar{v} = \frac{w}{k} = \frac{\lambda}{T} = \sqrt{\frac{T}{m}} = \sqrt{\frac{E}{\rho}}$ = The light-velocity in Conductors .

The frequency of the Longitudinal wave is $\rightarrow f_L = [ n ] \frac{\bar{v}}{2\lambda} = 0$ , $\frac{1.c}{2\lambda}$ , $\frac{2.c}{2\lambda}$ , $\frac{3.c}{2\lambda} \dots \dots \frac{n.c}{2\lambda}$ , **The equation** of motion of a **Standing-Wave** in Conductor $d = \lambda_{n(NS)} = AK_A \equiv 2 |r_{A-KA}| \equiv r_L \equiv \lambda$ is as , $\mathbf{y(x ,t) = 2N \sin[k\ x].\cos [(w = 2\pi c/\lambda)\ t]} \dots (9)$ where Longitudinal - frequency $f_L = ( n + \frac{1}{2} ) \frac{\bar{v}}{2\lambda}$ . The Amplitudes become zero at $y = 0$ when $\mathbf{k\ x = 0}$ , which implies $\mathbf{k\ x = n\ \pi}$ , $n = 0 , 1 , 2 , 3 , \dots n$ . and Since the sine-function repeats itself after every $\boldsymbol{2\pi}$ change in angle which is The Wavelength $\lambda$ , of the Wave , and from equation $\rightarrow \sin[k\ x] \equiv \sin[k\ x + 2n\pi] \equiv \sin k.[x + \frac{2n.\pi}{k}] \leftarrow$ **then** for **n =1** ,

The wavelength $\lambda = [ \frac{2.1.\pi}{k} ] = \frac{2\pi}{k}$ , and is **The-Unit-Energy ,** *The Quantum* **,** $k = \frac{2\pi}{\lambda} \dots (10)$ and Wave-equation $\rightarrow \sin[k\ x] \equiv \sin[k\ x + 2n\pi] \equiv \sin k.[x + \frac{2n.\pi}{k}] \equiv \sin[\frac{2\pi}{\lambda}].[\ x + \lambda\pi\ ] \dots (10a)$ Since , $\mathbf{k\ \lambda = 2\pi}$ constant and $\lambda$ , is the displacement for n =1 , then implies that $\mathbf{k}$ , is Force and because Force $\mathbf{x}$ Displacement = Work $\equiv$ Energy $\equiv$ motion , therefore $\mathbf{k\ \lambda \equiv E \equiv}$ Constant $\equiv$ **The Unit-Energy $\equiv$ Energy- Quantum** .

In case of Energy Equilibrium, then Frequency in Conductor $d = AK_A = \lambda / 2$ and , $f_L = (n + \frac{1}{2} ) \frac{\bar{v}}{2\lambda} \equiv \frac{0,5\ c}{2\lambda}, \frac{1,5.c}{2\lambda}, \frac{2,5.c}{2\lambda}, \frac{3,5.c}{2\lambda},,,,,, \frac{(2n+1)\ .c}{2\ \ 2\lambda} = \frac{1}{2} [\frac{c}{2\lambda}], \frac{3}{2} [\frac{c}{2\lambda}], \frac{5}{2} |\frac{c}{2\lambda}|,,,,,, \frac{2n+1}{2} |\frac{c}{2\lambda}|$ The Wave is a Force $\mathbf{Q} \overrightarrow{AK_A} = F = |\oplus => AK_A|$ , an Energy-Vector $| \oplus \mathbf{Q} \rightrightarrows \overrightarrow{AK_A} |\equiv| \leftrightarrow |$ that Propagates from the Place where it was created , The Point $\mathbf{A}$ , so **when** is found **an Obstacle** at **End-Point $K_A$** then the Particles of the Conductor medium oscillate Perpendicular $|\updownarrow||$ , because IT IS THE - ONLY - EXIT , to the direction of the **Wave - Propagation** , and by this Way the motion continues transverse as Longitudinal Wave in Conductor $d = AK_A$ as , $|\rightrightarrows \uparrow\uparrow|$ $\equiv \circledR$ , or in Conductor $d = \lambda_{n(NS)} = AK_A$ , The two Perpendicular Energy-Vectors , $|k_1 \times k_2| = k_{1\perp 2} = \mathbf{k} = \frac{2\pi}{\lambda} = \frac{2\pi f = w}{c}$ and Longitudinal Wave -Energy $\rightarrow c \{ k_1 \times k_2 \} = 2\pi.f$ , **or** $|\frac{k_1 \times k_2}{2\pi}|.c = \frac{c}{\lambda} = \mathbf{f}$ . In Figure -3 - and -9-

16

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**The** Obstacle at Edge $K_A$ **Point** , is *The Presentation of the* , $\oplus$ *constituent and The Lack of* $\ominus$ *constituent* **.** The **Transverse - Propagating-Wave ,** or the moving Energy -Vector $|\oplus \mathbf{Q} \Uparrow \overrightarrow{AK_A}| = |\updownarrow|$ at node $K_A$ , and with the Energy-Vector $|\oplus \mathbf{Q} \rightrightarrows \overrightarrow{AK_A}| \equiv |\leftrightarrow|$ at node A , consist The **Electromagnetic - Wave** in $d = AK_A = 2r$ Conductor **.** The Energy in this **Stationary Wave** of wavelength $\lambda = 2d$ is ,

$$\mathbf{E} = h\, f_L = h\, \frac{2n+1}{2}\,|\frac{c}{2\lambda}| = \frac{2n+1}{2}\,|\frac{hc}{2\lambda}| = |\frac{3.h.c}{4\lambda}| \qquad \ldots\ldots\ldots (11)$$

and from relation $\lambda = c\,T = \frac{c}{f} = \frac{2\pi}{k}$ , Then $k = \frac{2\pi}{\lambda} = \frac{2\pi f}{c} = \frac{w}{c} = |\frac{\bar{v}}{c}|.|\frac{1}{r}| = |\frac{\bar{v}}{c}|.|\frac{2}{\lambda}|$ , or the Propagating-**Transverse-Wave** carries **the Standing-Wave-Energy-Constant-magnitude**

$$\text{Constant-motion} \quad k = \frac{2\pi}{\lambda} = \frac{2\pi f}{c} = \frac{w}{c} = |\frac{\bar{v}}{c}|.[\frac{2}{r_{[A-KA]}}] \quad \ldots\ldots(12)$$

The two Perpendicular **Energy-Vectors** , $|\mathbf{Q} \rightrightarrows \overrightarrow{AK_A} = \leftrightarrow|$ and $|\mathbf{Q} \Uparrow \overrightarrow{AK_A} = \updownarrow|$ ,in Conductor **d** ,of this moving Energy FORM The **Energy-Square** , $\{|\leftrightarrow|.|\updownarrow| \equiv |\mathbf{Q} \rightrightarrows|\}.\{|\mathbf{Q} \Uparrow|\} \equiv u_0$ , on Conductors $AK_A$ . with Conductors - Pivot-axis Propelled on their **Merging -Resultant -axis** of direction $|\rightrightarrows \Uparrow \equiv \diagdown\!\!\!\diagup|$ **.**

In case of an **closed Conductor** above motion with Energy $= k = \frac{2\pi}{\lambda} = \frac{2\pi f}{c} = \frac{w}{c}$ , and with velocity $\bar{v} = \frac{w}{k} = \frac{\lambda}{T} = \sqrt{\frac{T}{m}} = \sqrt{\frac{E}{\rho}}$ , consists the ***Stationary–Energy-Storage*** with fundamental frequency $f_1 = (n + \frac{1}{2})\,\frac{\bar{v}}{2\lambda} \equiv \frac{3.\bar{v}}{4\lambda} \equiv \frac{3.\sigma\,\Phi}{4\lambda}$ .......(13) .

The Obstacle at $K_A$ Point is the $\oplus$ constituent which executes an **Coulomb force** $F_{[+\,\leftrightarrow\,+]} = \frac{[\oplus\leftrightarrow\oplus]}{r^2} = \frac{[\sigma.\sigma]}{r^2} = |\frac{\sigma}{r}|^2 = |\frac{e.}{r}|^2 = |\frac{2\pi f}{\Phi}|^2 = |\frac{w}{\Phi}|^2$ . The Energy $k$ at Point $K_A$ is the Total mass $M_T$ of Conductor $d = AK_A = r = \lambda_{n(NS)}$ equal to the Moment of Inertia $J_T = \frac{m.r^2}{3}$ ,where **m** is the stiffness per meter of Conductor **r .** The Impact of this mass at THE end-Point is the Energy $= J\,w$ and Impact $\rightarrow m\,v = J\,w\,r = [\frac{m.r^2}{3}]\,.wr$ , or velocity after impact velocity $\rightarrow$ $v = [\frac{r^3}{3}].2\pi f = [\frac{2\pi f.r^3}{3}]$ .......(14) **Coulomb force** with fundamental frequency becomes $F_{[+\leftrightarrow+]} = |\frac{2\pi f.}{\Phi}|^2 = [\,\frac{2\pi}{\Phi}|\frac{3.\bar{v}}{4\lambda}|]^2 = |\frac{3\pi v}{2\lambda\Phi}|^2$.......(15)

Placing velocity after Impact (14) in Equation (15) then the **concentrated Energy** at Point $K_A$ is $F_{[+\leftrightarrow+]} = \{\frac{3\pi}{2\lambda\Phi}[\frac{2\pi f.r^3}{3}]\}^2 = |\frac{\pi^2 r^4 f}{\lambda r.\Phi}|^2 = |\frac{B=(\pi^2 r^4 f)}{\lambda r.\Phi}|^2 = |\frac{\bar{B}}{\lambda r.\Phi}|^2 \equiv$ Angular-momentum $\equiv$ **SPIN** ......(16) In Short-distance **Conductor d** $= 6,195543.10^{-7}$m , the Magnetic-field $\bar{B} = \frac{m.v}{q\,r} = \frac{9.10^{-31}Kg.2,9979.10^8\,m/s}{1,6.10^{-19}C.[6,195543.10^{-7}]} = 2,718088.10^{13}$ Telsa , which is Perpendicular , *normal* , to the Conductor`s axis . $\rightrightarrows$ **i.e.**

**In a Closed Energy-Conductor r** $_{[+\leftrightarrow+]}$ **, the fundamental frequency f$_1$ becomes the Spin**. The **Energy- Square - Prism** , $|AK_A|.\{\mathbf{Q} \rightrightarrows \overrightarrow{AK_A}\}.\{\mathbf{Q} \Uparrow \overrightarrow{AK_A}\} = |Q_x.Q_y|.|AK_A| = k_x.k_y|.|AK_A|$ $= |\leftrightarrow|.|\updownarrow|.|AK_A|$ .....(17) , where $|\leftrightarrow| = |k_x|$ the Conductor`s **Axial-energy** , $|\updownarrow| = |\circlearrowleft|$ the Conductor`s Rotation-Energy $=$ **SPIN** , and $|\leftrightarrow|.|\updownarrow|$ the Conductor`s Resultant-energy-Vector is an **Cruise-missile** . When a Conductor $d = AK_A = r = \lambda_{n(NS)}$ **has a Hole at an Point A$_E$** such that $AA_E = 2\,r$ ,$\{$ A $-2r-$ **A$_E$** $-r-$ **K$_A$**$\} = $ **d** then The Energy $k$ at Point **A$_E$** is the Total mass $M_T$ of Conductor $AA_E = 2\,r$ equal to the Moment of Inertia $J_T = |\frac{m.4r^2}{3}|$ , where **m** is

17
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

the stiffness per meter of Conductor 2r **.**

From equation (15) Coulomb force $F_{[+\leftrightarrow+]} = \left|\frac{2\pi f.}{\Phi}\right|^2 = [\frac{2\pi}{\Phi}|\frac{3.\bar{v}}{4\lambda}|]^2 = \left|\frac{3\pi v}{2\lambda\Phi}\right|^2$ becomes as

$F_{[+\uparrow\downarrow\,\downarrow\uparrow+]} \equiv F_{[+\leftrightarrow+]}$ , equal and Perpendicular and $\{\mathbf{Q} \rightrightarrows \overrightarrow{AA_E}\} = \{\mathbf{Q} \upuparrows \overrightarrow{AA_E}\}$ , $|Q_x| = |Q_y|$ , $|k_x| = |k_y|$ , $|\leftrightarrow| = |\updownarrow|$ ……(17a) Transverse motion $|\updownarrow|$ , Presupposes an $|\leftarrow|$ Impact of the mass at end-Point $A_E$ and is the Energy = - J w  and because lack of Obstacle Impact → mv = - Jw² = $[\frac{m.r^2}{3}].w^2$ , or velocity after impact → $\mathbf{v} = -[\frac{2\pi f.r^3}{3}] = -[\frac{v.r^2}{3}]$ ..(14a). Placing velocity after Impact (14a) in Equation (15a) then the **concentrated Energy** at Edge Point $K_A$ is

$F_{[+\leftrightarrow+]} = \{\frac{3\pi w}{2\lambda\Phi}[\frac{-2\pi f.r^2}{3}]\}^2 = \left|\frac{w[\pi^2 r^4 f]}{r\lambda\Phi}\right|^2 = \left|\frac{w.B=(\pi^2 r^4 f)}{r.\lambda\Phi}\right|^2 = w^2.\left|\frac{\overline{B}}{r\lambda\Phi}\right|^2 \equiv \left|\frac{2L= w.\overline{B}}{r\lambda\Phi}\right|^2$

≡ The Total Energy 2L to the Twin circles squared , or to Angular- momentum ≡ **SPIN** squared …….(16) $\rightrightarrows$ **i.e.**

**In an Energy – Slit - Conductor** $r_{+\{A\,-2r-\,A_E\,-r-\,K_A\}=\,d\,+}$ , **the fundamental frequency $f_1$ becomes the Spin ,** Or , **The carrier of the Total-Energy** 2L **of the moving - System** . At $A_E$ Point **Energy - Square-Prism** is → $|AA_E|.\{\mathbf{Q} \rightrightarrows \overrightarrow{AA_E}\}.\{\mathbf{Q} \upuparrows \overrightarrow{AA_E}\} = |Q_x.Q_y|.|A_E K_A|$ = $|k_x.k_y|.|A_E K_A| = \equiv |\leftrightarrow|.|\updownarrow|.|A_E K_A|$ ………(18) , where $|\leftrightarrow| = |k_x|$ the Conductor`s **Axial-energy** , $|\updownarrow| = |k_y|$ the Conductor`s . **Transverse - Energy** , $|\circlearrowleft|$ the Conductor`s Rotational-Energy = **SPIN** , where $|k_x.k_y| = |\leftrightarrow|.|\updownarrow| \equiv \maltese = $ **The Dot-Product** = Area of Vectors , which is a Scalar magnitude   $\mathbf{A_{x.y}} = |\mathbf{k_x}|.|\mathbf{k_y}|.\cos\theta$ , where $\theta$ , is the angle between the two vectors , $k_x$ , $k_y$ and  , **The Cross-Product** =The Resultant-Vector =®=

$\overline{\mathbf{R}} = \mathbf{k_x} \times \mathbf{k_y}$ which is Perpendicular to $k_x,k_y$ vectors  where , $r = \sqrt{k^2_x + k^2_y}$ , x = r.cos θ ,

y = r.sin θ , $\theta = \tan^{-1}(\frac{y}{x})$ , and   $\overline{\mathbf{R}} = \mathbf{k_x} \times \mathbf{k_y} = \frac{\mathbf{w}}{\mathbf{c}} = \frac{2\pi}{\lambda}$

The Conductor`s Resultant-Energy-Vector , ® = $\overline{\mathbf{R}}$ , is as an **Non-guided Cruise – missile** . From Total Energy relation $2L = B w \equiv E_K + E_U \equiv |k_x|+ |k_y|$ is seen that , $k_x$ , $k_y$ , consist the **2-Line** , **Plane-Launcher** of { **Energy ≡ motion- missile** } into → Two Perpendicular and Equal Conductors , with Conductors-Pivot-axis Propelled **ON** their **Merging-Resultant axis** of the two  directions $\rightrightarrows \upuparrows \equiv \maltese$ **.** In One-Conductor , $k_x = \overline{ZA}$ , $k_y = \overline{1,MM}$ , Resultant $\overline{R} = \overline{Z1MO}$ , while for (2) → In Two-Conductors , $k_x = \overline{ZB}$ , $k_y = \overline{ZA}$ , $R = \overline{Z,1\_2\_3,MO} \equiv \maltese$ The Total Energy $2L = B w \equiv E_K + E_U \equiv |k_x|x|k_y|x|AK_A| \equiv |k_x|x|k_y|x|\lambda| \equiv$ An  Propagating-Wave in $\lambda$ , **i.e. Energy-Square-Prism** is a Moving-Energy-Volume and **Because** from Cauchy equations of Stresses in three dimensions , **The Energy Stress remains Flat ONLY WHEN the Plane - Section becomes a circle , And Because** from Mechanics the  **Sphere** occupies the **Least - Resistance** to the motion , then the  **Square - Prism** is altered to the Equivalent , **Energy-Sphere - Cone** → $\mathbb{C} = k\,\pi r^3$ ← Fig-9a ,9b , 9c.
where the **Cube** $[|\leftrightarrow|.|\updownarrow|.|AK_A|]$ = x³ becomes an **Sphere–Cone** $\equiv \mathbf{Q}.\overrightarrow{AK_A}| \rightrightarrows |\frac{\lambda}{\uparrow\downarrow}| \rightarrow$

$\mathbf{k\,\pi\,r^3 = x^3}$  . From the max-sin $|\frac{w.AK_A}{c}| = 1$ , of equation (6)  then

$\mathbf{u = [\,C\,\sin wt + D\,\cos wt\,].\sin|.\frac{w.AK_A}{c}|}$ ………..(14a)

The condition $\mathbf{u = y}$ ($AK_A$ , t ) = 0 , leads to the equation → $\sin|\frac{w.AK_A}{c}| = \mathbf{0}$ **,** or to …**(14)**

**For the Duality-Photons issues**   , $\bar{v} \cdot [\,\overline{f_n} + f_n\,] \equiv |\frac{v}{\pi^2.\ r^4_n}|.\overline{B_n} + |\,\overline{c}\,|\,f_n$           ………..(15a)

Or       $\bar{v}. [\,\overline{f_n} \equiv (n+\frac{1}{2})\,\frac{\bar{c}}{2.|AK_A|}\,] + [\,f_n \equiv n\,\frac{\bar{v}}{2\lambda}\,] \equiv \rightarrow \bar{v}\,\{\,|\frac{\bar{c}}{2.\lambda}|\,(n+\frac{1}{2}) + \frac{n}{2\lambda}\,\}$ ……….**(15)**

18
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**E-Vectors** $|\mathbf{Q} \rightrightarrows \overrightarrow{AK_A} = \leftrightarrow| \; x \; |\mathbf{Q} \uparrow\uparrow \overrightarrow{AK_A} = \updownarrow |x|AK_A| \equiv |Q_x.Q_y|.|AK_A| \equiv |\leftrightarrow|x|\updownarrow|y|\lambda| \equiv k\,\pi\,r^3$.

From Wave-Energy-constant $\mathbf{k} = \frac{2\pi}{\lambda} = \frac{2\pi f}{c} = \frac{w}{c} = |\frac{\bar{v}}{c}|.\{\frac{1}{r} = \frac{2}{r_{|A-KA|}}\}$ so $c = \frac{w}{k} = \lambda\,f$, or $|\frac{\bar{c}}{2.|AK_A|}| \equiv \mathbf{f}$

**i.e.** Frequency $f_{AK_A}$ of Pipe $|AK_A|$ is the Stationary-Photon Energy-Storage $\boxed{f_n} \equiv |\frac{\bar{c}}{2.|AK_A|}| \equiv$

$|\frac{\bar{c}}{\lambda}|$ ...(16) and Photon $\bar{v}.\;[\;\boxed{f_n} + f_n\;] \equiv \bar{v}.\{\;|\frac{\bar{c}}{\lambda}| + f_n\;\}$ i.e. , as **Particle** $\equiv \bar{v}.\;|\frac{\bar{c}}{\lambda}| \equiv E_U \equiv$ Potential

Energy , and as **Wave** $\equiv \bar{v}.\;f_n \equiv E_K \equiv$ Kinetic Energy . Since Energy- Constant-magnitude , **k ,**
denotes the **Total motion** then needs a **Scalar -Magnitude** for measurements and a **Vector-Magnitude** for Directions .

In Conductor $D = |AK_A|$ , $|\,\mathbf{D}\,| \equiv$ The Scalar Magnitude between Points , which gives also the
direction of motion with Points , A , $K_A$ , and $\overrightarrow{AK_A}$ vector the Direction which defines the

Vector $\overrightarrow{AK_A}$ . The Total Energy $\mathbf{k} = |\frac{\bar{v}}{c}|.[\frac{2}{r_{[A-KA]}}]$ of Photon-wave is Split as, $E_U + E_K = k \equiv$

Potential + Kinetic Energy where

$E_U \equiv \bar{v}.\;|\frac{\bar{c}}{\lambda}| \equiv \mathbf{Particle} \equiv \bar{v}\,\{\,|\frac{\bar{c}}{2.\lambda}|\,(n + \frac{1}{2})\,\} \equiv |\frac{v}{\pi^2.\,r^4_n}|.\boxed{B_n} = |\frac{v}{\pi^2.\,r^4_n}|\,r^2.q.\bar{B}_M \equiv |\frac{q.v}{\pi^2.\,r^4_n}|\;x\;\bar{B}_M$

is the Stationary-Storage $\equiv$ Particle $\equiv$ Magnetic-field with velocity , **v** , in cave $\lambda = 2r = 2\pi / k$

and $E_K \equiv \bar{v}.f_n \equiv \mathbf{Wave} \equiv$ Kinetic Energy $= \frac{2\pi}{\lambda} = \frac{q}{k.A} = \frac{q}{k.\pi r^2} = \frac{\sigma.\Phi}{k.3r\bar{B}_M} = \{\frac{\sigma.\Phi}{k.3r}\}\frac{1}{\bar{B}_M} = \frac{c/E}{\bar{B}_M}$ , and

$\bar{E}_E \equiv c\bar{B}_M$ , and the moving Electromagnetic-wave is ,

$\bar{E}_E = |\bar{E}_0|.sine\,[kz - wt]$ , $\bar{B}_M = |\bar{B}_0|.sine\,[kz - wt]$ , $k = \frac{2\pi}{\lambda}$ ,

   **Motion** is kept in Caves as **Electric , Magnetic fields** and as frequencies and conserved
in them when **the Space-Points** become Energy-Conductors . The in caves **Energy-Import**
is shown in Figures .

   **Examples** :

**1..** In an Conductor d = $AK_A$ = 2r , with $\oplus$ obstacle at $K_A$ Point occupies zero velocity and
   $\oplus$ Charge is accelerated . The Initial light-velocity is accelerated as $v^2 = \bar{v}_o^2 + 2a.r$ , or

   $a = \frac{-\bar{v}_o^2}{2.r} = \frac{[2,9979.10^8]^2}{2.r} = \frac{8,9874044.10^{16}}{2.r}$ m/s² . For Conductors , r = $10^{-16}, 10^0, 10^{16}$ then ,

   **a1** $= \frac{-\bar{v}_o^2}{2.r} = \frac{8,9874.10^{16}}{2.10^{-16}} = 4,4937.10^{32}\,\frac{m}{s^2}$ , **a2** $= \frac{-\bar{v}_o^2}{2.r} = \frac{8,9874044.10^{16}}{2.10^0} = 4,4937022.10^{16}$ m/s²,

   **a3** $= \frac{-\bar{v}_o^2}{2.r} = \frac{8,9874044.10^{16}}{2.10^{16}} = 4,4937022.10^0$ m/s².

Force on Charge becomes from the Electric field as $\bar{F}_K = m.\bar{a}_x = q.\bar{E}_F = +e.\;\bar{E}_F$ and $\bar{E}_F = \frac{m.a}{q = e}$ ,

or    $\bar{E}_F = \frac{m.a}{e} = \frac{m}{e}\,[a] = \frac{9.10^{-31}}{1,6022.10^{-19}}\,[4,4937022.10^{32}] = 25,242366.\;10^{20}\,\frac{N}{C}$

   $\bar{E}_F = \frac{m.a}{e} = \frac{m}{e}\,[a] = \frac{9.10^{-31}}{1,6022.10^{-19}}\,[4,4937022.10^{16}] = 25,242366.\;10^4\,\frac{N}{C}$

   $\bar{E}_F = \frac{m.a}{e} = \frac{m}{e}\,[a] = \frac{9.10^{-31}}{1,6022.10^{-19}}\,[4,4937022.10^0] = 25,242366.\;10^{-12}\,\frac{N}{C}$

**i.e.** The $\oplus$ Charge is accelerated **Opposite to initial direction** of $\ominus$ **Charge** in an
   Electric-field $\bar{E}_F$ . This Property of Acceleration , creates the Magnetic-Fields in
   Electric Conductors as Atoms are .

**2..** Uniform circular motion of electron in Caves constitutes a current $I = \frac{e}{T} = e.f$ , and T = $\frac{2\pi r}{c}$ ,

   $I = \frac{e.c}{2\pi r} = \frac{1,6022.10^{-19}.2,9979 10^8}{2\pi.r} = 7,644811.10^{-12}.\,[\frac{1}{r}]$ , and for **r = $10^{-16}$, $10^0$, $10^{16}$ m** then

   $I = \frac{e.c}{2\pi r} = 7,644811.10^{-12}.\,[\frac{1}{r = 10^{-16}}] = 7,644811.10^4$ - $7,644811.10^{-12}$ – and

                                 $7,644811.10^{-28}$ Ampere.

19
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**3..** The Electric-Potential $\mathbf{V} = \frac{\mathbf{q}}{\mathbf{r}} = 8,99.10^9 \frac{Nm^2}{C^2}[\frac{1,602.10^{-19}.}{r \ = \ 10^{-16}}] = 14,4038.10^6 = 1,44038.10^7$ Volt

$\mathbf{V} = \frac{\mathbf{q}}{\mathbf{r}} = 8,99.10^9 \frac{Nm^2}{C^2}[\frac{1,6022.10^{-19}.}{r \ = \ 10^0,10^{16}}] = 14,403778.10^{-10}$ V , $14,403778.10^{-26}$ V ,

**4..** Electric-Field $\bar{\mathbf{E}}_F = \frac{\Delta V}{d} = [\frac{14,403778.10^6.}{r = 10^{-16},10^0,,10^{16}}] = 14,403778.10^{22}, 14,403778.10^{-10}$ V

**5..** Force on electron is $F = q . \bar{\mathbf{E}}_F = 1,6022.10^{-19}.\{14,403778.10^{22}\} = 23,077733.10^3$ N and

$F = q . \bar{\mathbf{E}}_F = 1,6022.10^{-19}.\{14,403778.10^{6-16}\} = 23,07.10^{-13}$ N, $23,077733.10^{-35}$ N , and

**6..** The Produced Work is $W = F.ds = F \ r = 23,077733.10^3.\{10^{-16}\} = 23,077733.10^{-13}$ J .

$W = F.ds = F \ r = 23,077733.10^3.\{10^0,10^{16}\} = 23,077733.10^3, 23,077733.10^{19}$ J . $e_0$

**7..** Intensity $I_{E-r}$ is , $\mathbf{I}_{E-r} = \frac{c.E^2}{2} = [\frac{2,998.10^8.1,602210^{-19}(14,4038.10^{22})^2}{2}] = 498,26077.10^{33}$ W/m2

$\mathbf{I}_{E-2} = \frac{c.E^2}{2} = 498,261.10^1$ W $= 4,9826077.10^3$ W and $\mathbf{I}_{E-3} = \frac{c.E^2}{2} = 4,9826077.10^{-29}$ W/m²

**8..** The Power $\mathbf{P}_{E-r} = \frac{E^2}{Z=\pi r^2} = \frac{(14,403778.10^{22})^2}{\pi.(10^{-16})^2} = 6,60394.10^{77}$ W , $6,60394.10^{57}, 6,604.10^{13}$ W

**9..** Two-Capacitors Conductor of area **A** and Charge **q** Charge density is on Plates $\boldsymbol{\sigma} = \frac{q}{A}$

and Electric field $E = \frac{\sigma}{e_0} = \frac{q}{A e_0}$ and from Potential difference V= E d then $E = \frac{V}{e_0}$ and

$\frac{V}{d} = \frac{q}{A e_0}$ or $V = q.[\frac{d}{A.e_0.}] = \frac{q}{A} = E \ d$ . From above $\rightarrow A = \frac{q.d}{V} = [\frac{1,602210^{-19}(10^{-16})}{14,403778.(r=10^6)}] = $ m2

$1,11235.10^{-42}, 1,11235.10^{-26}, \mathbf{1,11235}.10^{-10}$ m2 , Stress $\sigma = \frac{q}{A} = 1,44038.10^{23,7,-9} \frac{T}{m^2}$

**Remarks : 1..** The **Stress-Strain Relationship** , from **Static theory of Elasticity** solves
the Problem of static ***Indeterminacy***. That is , the Stress Parameters $\sigma_x$ , $\sigma_y$ ,
are bound in , (1) By the ***Stereo static conditions*** (2) and by the **Constraint** that the Strain
accompanying the Stress $s_x$ , $s_y$ , remains **Geometrically Continuous** . This Property of
the Stresses allows .the Transportation of the Informations on Knots to the Polygon-Sides.

**2.. When a Body contains Potential Energy ,**

During any Unloading it gives off Mechanical - Work , since the Points
of application of the GRADUALLY - withdrawn Loads are Displaced.
If the Unloading is ABRUPT , then Kinetic Energy is converted into Potential and after is
Kinetic , converted back into Kinetic and so on . That is, the body Performs an Oscillating
motion until the Mechanical Energy is extinguished due to a State of Equilibrium or Alters .

**3.. The Action of the Complex–Vectors** create the Waves of Motion ≡ **Energy Waves** ,

which are closed curves and Transported . The **Pattern** of Disturbances with the Informations ,
Propagates from the One-Edge-Point to the other Edge-Point of Conductors , **OR** is on the
[Sub-Units] . Action of Vectors exist on Polygon–Conductor`s $d$ = Side $\lambda_{n(NS)}$ of Polygons.

**4.. Action of a SIGNAL which Strikes the Tetrahedron–Cube-Spheres Mechanism .**

Unloading happens on the three Tetrahedron - Sides which withdrawn Loads are Displaced On the
Anti-Parallel-Strand . If the Unloading is ABRUPT, then Kinetic Energy of 1-Strand is converted in
the 2-Strand as Potential and so on . That is , CUBES Perform an Oscillating motion until the
Mechanical Energy is extinguished to their Vertices , which are the stores of Information .

**5.. The Harmonic displacement of Support-Points on a Regular Polygon vertices .**

**The Projections of Heights** $y_n$ of **a Regular Polygon** are as $2.y_n = n \ R$ , which allows to the
**Vector- Force Polygon** to follow the **Space-Vector-Wave** $= 2R.e^{i.nwt} = 2R.[\cos w \ t + i .\sin wt]$ .
**i.e. Complex frequency Response ,** Happens on the **Regular Polygon Vertices only** .

**6a.. THE ORIGINATION OF PRIMARY MOTION IN E - SPACES .**

20

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

   **The Stress - State** ($\sigma$ , $\tau$) **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 $\mathbf{T}^{\vec{n}}$ across an **Imaginary Surface** (in M-Geometry is $\Phi$)
Perpendicular to $\vec{n}$ , $T^{\vec{n}} = \vec{n}\,\sigma$ , or $T_j^{\vec{n}} = \sum \sigma_{ij}\, n_i$ , obeying to the Tensor transformation
law for Stress Analysis . A contact Force $\Delta F$ exerted at Point P of element area $\Delta A$ , the
ratio $\Delta F/\Delta A$ becomes $dF/dA$ and the couple stress vector $\Delta M$ vanishes and prior tensor
becomes $T_j^{\vec{n}} = \lim\limits_{\Delta S=0} \Delta Fi/\Delta S = \frac{dFi}{dS}$ . 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-1-3) the eternal Rotation
of the two **Opposite** [$\oplus\,\cup\,\cup\,\ominus$] **constitutes** , and because of their in between **Stress $\sigma$**
which is equal to the Centripetal-Force then **issues** $F_C = \sigma = \frac{m.v^3}{r} = J\,w^2\,r = \overline{B}\,r$ ,where
the **monad r $\equiv$ monad R** $= \frac{\sigma}{J.w^2} = \frac{\sigma}{\overline{B}}$ **i.e.** The **Stress $\sigma$** , which is created **between the**
**Opposite** [$\oplus\leftrightarrow\ominus$] , and through the only Possible Rotational-motion , Originates the
Angular-velocity $\breve{w} = \frac{\sigma.\Phi}{r} = 2\pi r.f$ and the Angular Momentum $\overline{B} = \frac{\sigma.}{r} = \frac{\sigma.}{R}$ , which when
**Placed on AB** Diameter = **2R = The Monad** consist the **Neutral – Spaces - Energy**.
The Planck`s cave , $10^{-35}$ m , is **The Safety-Valve $\equiv$ The Critical State** for the **Stress**
**Ellipsoids** , $\overline{B}\,\overline{w}$, Vectors in order that this Total-Energy to **Superflow** and be **Still** into
Vacuum $\equiv$ [$10^{-62}$-$10^{-35}$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 $|\overline{R}| \equiv |AB|$ } , Decomposes** $\leftarrow$ {Fig-14}
**The Rolling of Polhode Unit-Space into the Herpolhode Space-monad Cone**.
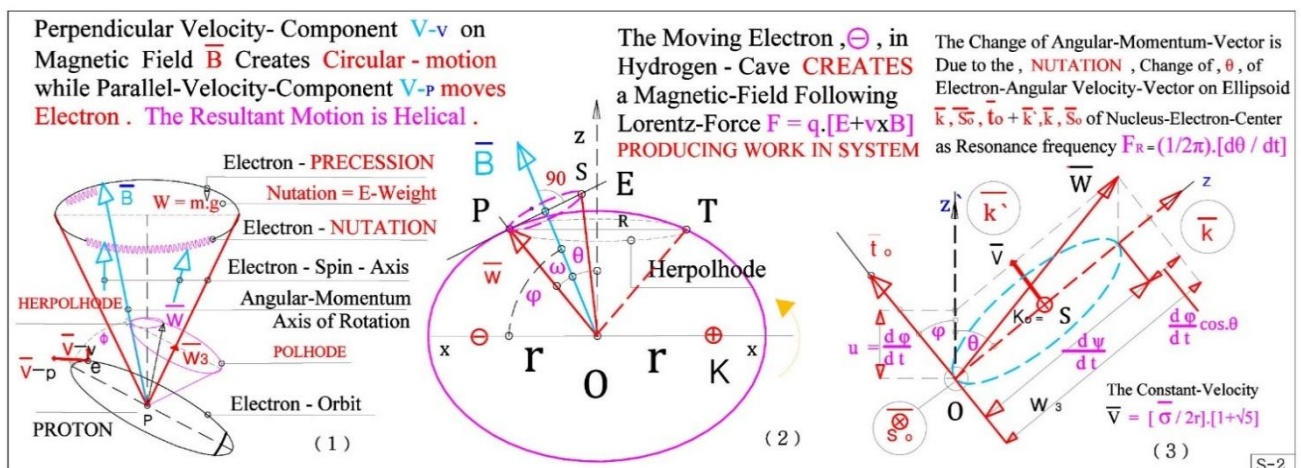


**Figure -4-** The Central Axial-Ellipsoid of $\oplus$ constituent Rotating through constant Point O .

In (**1-2**) *The $\oplus$ Material Point* **OK** , {$\oplus \equiv$ O,[OK = R] $\equiv$ The Space}, continually Rotates
   around *The $\ominus$ Material Point* **OK**, { $\ominus \equiv$ O , [OK] $\equiv$ The Anti-Space }, on 2R circle .
Their Common circle center , forms the material angle $\varphi = \varphi_P.t = (\frac{v_P}{\sqrt{c^2-r^2}}).t$ , which then

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**CREATES** at any **contact Point P** the Centripetal Force $F_C = \frac{mv^2}{r} = \frac{\pi r^2}{2r}[w^2. r^2] = \frac{\pi.r^3}{2}[w^2]$. The vector $\breve{w}$ 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 $\breve{B}$ 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 [⊕ʊʊ⊖] the time is as Period **T** , and **Momentum** is the Angular-velocity $\breve{w}$ and Angular Momentum $\overline{B}$ , where the Momentum $\overline{B}$ = r m v = **m** $\breve{w}$ **r²** = ± [ $\frac{\pi.r^2}{2}$ ].$\bar{c}$ x $\bar{r}$ and ± [ $\frac{\pi.r^2}{2}$ ] ≡ **the Hemi - circle** area . The Polhode is of radius **a** , and rotates with an angular velocity $\breve{w} = 2\pi.f_P$ in the Cone πa².s . The Herpolhode is of radius **r** , and is the Stationary Cone πr².s . with an angular Momentum $\breve{B}$ = r m v = r m (w r) = **m** $\breve{w}$ **r²** . 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* $\overline{B}$ , *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 :**

**a..** The Position of the Herpolhode Cone is , Fig-4.

   **x** = a.sin θ. cos wt , **y** = a.sin θ. sin wt , **z** = a - a.cos θ = a.[ 1 - cos θ ] where exists , **a** = The Polhode Cone Base-radius , **r** = The Herpolhode Cone Base-radius [ x , y . z ] = Coordinate System such that **z-axis** ⊥ [**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 a².[ $\dot{\theta}^2 + w^2.\sin^2 \theta$ ] , and $E_U$ = m g z = - m g a.cos θ

The Lagrangian **L$_{KU}$** = m.a².[ $\frac{\dot{\theta}^2}{2}$ - V$_{EFFECTIVE}$ ] , where the Effective Potential V$_{EFFE}$ is

V$_{EFFE}$ = - $\frac{1}{m,a^2}$ [ m g a.cos θ + $\frac{1}{2}$ m a².w².sin² θ ] = - [ $\frac{g.\cos\theta}{a} + \frac{w^2.\sin^2\theta}{a}$ ] …..(e)

The equation of motion for the Bead becomes from Lagrangian which is $\ddot{\theta}$ = [ $\frac{\partial V_{EFFE}}{\partial \theta}$ ] ..(b)

Since θ is constant then issues $\dot{\theta} = \ddot{\theta} = 0$ , and for the Bead-Herpolhode motion $\frac{\partial V_{EFF}}{\partial \theta}$ = 0 ..(c)

Equation (c) is Stationary at Positions which satisfy relation **g.sin θ = a.w².sin θ.cos θ**..(c1)

1…The Solutions of (c1) are at Position sin θ = 0 where issues          **θ = 0**

2…The Solutions of (c1) are at Position sin θ.cos θ = sin 2θ = 0 and is **θ = π & 2θ = 2π**

3…The Solutions of (c1) are at Position cos θ = $\frac{g}{a.w^2}$ and for θ = 0 then **w² = $\frac{g}{a}$**

**Remarks :**

1… Solution (1) for θ = 0 exists always and from Figure-4-(2) the velocity vector $\breve{v}$ is applied at the center of mass **K$_0$** , Anti-clockwise Spinning . Fig-4-(3)

2… Solution (2) for θ = **π** exists always and from Figure-4-(2) the velocity vector $\breve{v}$ is

22
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

applied at the center of mass $K_0$ , Clockwise Spinning .          Fig-4-(3)

3… Solution (3) where since $\theta = 0$ exist the Prior and from Figure-4-(2) velocity vector $\v{v}$ 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 $-V_{EFFE}$.

The Solution $w^2 < \frac{g}{a}$ and $\theta = \pi$ , Determines Stability at Point O Position and $+V_{EFFE}$.

For Solution $w^2 > \frac{g}{a}$ and $\theta = 0$ , The Position is Unstable at Point O with $-V_{EFFE}$.

For Solution $w^2 > \frac{g}{a}$ and $\theta = \pi$ , The Position is Unstable at Point O with $+V_{EFFE}$.
                    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 $+V_{EFFE}$. 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 $\v{w}$ and that of Angular Momentum $\bar{B}$ , differently Black-Hole.

-----------------------------------------------------------------------------------------------------------

Both magnitudes define the **Unit-Energy Vectors** $\rightarrow$ { <u>**Unit-E Vector R**</u> $= \frac{\sigma}{J.w^2} = \frac{\sigma}{B}$ } $\leftarrow$

**When** the <u>**Unit-E.Vector R**</u> is Placed ON [**AB≡2R S.Diameter** of Spaces-Neutral-circle]
**Then** the **Energy-Monad** $|\bar{R}|$ exists on **Space-Monad $|AB| \equiv |\bar{R}|$** as {**E+S -Monad $|\bar{R}|$**},
            i.e. IS THE { **Energy - Space - Monad $|\bar{R}|$** } ,       with   the   magnitudes ,
Spaces Sides $\lambda_n = 2,\sqrt{R^2 - a^2_n}$ ,   &  , Quantum Critical-Side $a_n = \frac{1}{2}\sqrt{4R^2 - \lambda^2_n}$ ,

-----------------------------------------------------------------------------------------------------------

**The Quantization of Energy in Spaces** , happens when follow the *Archimedes formula* for

Doubling the Vertices **n** , $\lambda_{2n} = \sqrt{2R^2 - R\sqrt{4R^2 - \lambda^2_n}}$ & Critical-Sides $a_{2n} = \frac{1}{2}\sqrt{4R^2 - \lambda^2_{2n}}$

where then Energy is divided and spread on the double number of the Polygon Sides .

**M**onad **R** $= \frac{\sigma}{J.w^2} = \frac{\sigma}{B}$ remains the same , while **Spaces Sides** change as above $\lambda_{2n}$ , $a_{2n}$ .

## 7a.. THE   MECHANISMS  &  CHARGES , FOR  DUAL - ORIGINATIONS ,

THE NATURAL - Spaces of **AB** Diameter is the { $\overline{AB}$ Unit Complex Vector } .

**1… Spaces** ≡ The Infinite (+) **Circumscribed-Regular-Polygons in $\overline{AB}$** . [Fig-1,3].

**2…Anti - Spaces** ≡ The Infinite (-) **Circumscribed-Regular-Polygons in $\overline{AB}$** .[Fig-1,3].

**3…Sub**. **- Spaces** ≡ The Infinite (+) **Inscribed-Regular-Polygons** on Diameter $\overline{AB}$.[F-1,3].

**4…Neutral-Spaces** ≡ The Infinite **Circles** on Diameter $\overline{AB}$ .(The Sphere on AB), [Fig-1,3].

**5…{MFMF}** ≡ **The Gravity cave** $= 10^{-62}$ m .

**6…{ PNS }**  ≡ **The Planck`s cave Length** $= 10^{-35}$ m .

**7…Vacuum** ≡ [ $10^{-62}$ -- $10^{-35}$ m ] = The **in-between distance** $\Rightarrow$
THE **Origination-Mechanisms** in Spaces & the Origin of **Charges**.

**8…Action-Spaces** ≡ The Infinite **Quaternion - monad**s $\rightarrow$ $\bar{z} \equiv ( s + \bar{v}.i ) \equiv \overline{AB} \equiv$
$\equiv \sqrt{s^2 + [\bar{v}.i]^2}$ , or $\bar{z} \equiv x + i.y \equiv \overline{AB} \equiv$ moduli , r , is their magnitude
[ $r = |r| = \sqrt{x^2 + y^2}$ ] , on Unit-Diameter $\overline{AB}$ . The [QMAS] . For Quaternion v = s
$\vec{z} * \vec{z} = (s + \bar{v}.i)^2 = s^2 + [\bar{v}]^2 + 2.s\bar{v}.i = s^2 - \bar{v}^2 \pm 2.s\bar{v} = |s|^2 - |\bar{s}|^2 \pm 2.|s|.|\bar{s}|$ , for $|\bar{v}| = s$ .

## 8a.. THE  Material - Geometry ,  E-Geometry , Physics AND  Chemistry .

23
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**8..[a].. The { STPL } Mechanisms** in Spaces , from **Charges** in Under-Planck`s-Length ≡
*The Six Triple Points Line Mechanism* ≡ *The Complex Vector-Spaces Rotor* ,
It is a Mechanism on where the Charges of Opposites , [⊕↔⊖] , React as Centrifugal
force $F_C$ which in turn changes → (Action-Reaction ≡ + Spin – Anti Spin) ←of [MFMF]
Space **To** Rotational motion Angular-velocity = $\overline{w}$ & Angular-Momentum = $\overline{B}$ . [Fig-6].

**8..[b].. The {TVPM} Mechanisms** , from **Charges** on Two-Perpendicular-Vectors-Edges ≡
*Markos Two - Vectors Three - Poles Mechanism* . [Fig-8a , 8b].
In Fig-8|4| , Vector $\overline{CP} \perp \overline{CA}$ Vector , which changes the **Energy** ≡ **The Stress** σ of
The $|\overline{CP} \times \overline{CA}|$ Square , to **2 - Halve ± Squares** on Vectors-axis for Equilibrium .

**8..[c].. The { TCIC } Mechanisms** , from **Charges** In Three-Vectors-Conductors-Edges ≡
*Markos Tetrahedron Cube Inscribed-Circumscribed Circles Mechanism* . [Fig-27-29].
In Fig-6 , 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** and **Signals** .

**8..[d].. The {TOBH} Mechanisms** , from **Charges** In Two-Orbits-Pins & Drain.
*Markos Atoms Bonding Bracket - Hook Mechanism* .     [Fig-2].
In Fig-9 , The ⊖ - Electron Precesses due to the Gravity and Produces Work which is
stored in a second Orbit . This 2-Orbit equilibrium exists from the Existing ⊖ -Electron
≡ DRAIN and from the New ⊕ -Nucleus ≡ The PIN . The Second -Orbit called as the
**Bracket – Hook -Mechanism** , with which Atoms and Compounds are Bonded .[99-104]

The **{ LNCS } 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 or , **d (T + U) ≡ δW$_{NPF}$ = 0** , as exists in
the **Gravitational Force G** and from which are created → **The Elementary Particles**
using the STPL – Mechanism , **and all Universe** using the ISTCCS – Mechanism ← and
**The DUAL → The Black - Holes ←** as equation δW$_{NPF}$ = $\sum_{i=1}^{N}$ Qi. δqi , [Fig-3, 21 , 22].

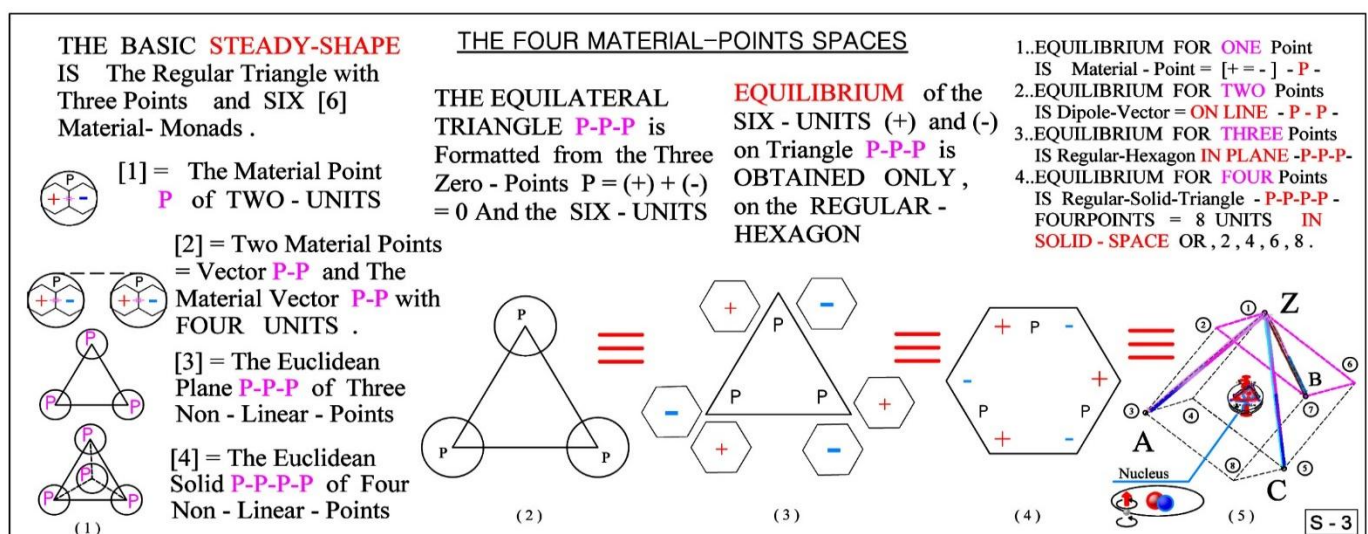**8..[e].. MATERIAL-GEOMETRY & E-GEOMETRY IN PHYSICS and CHEMISTRY**



**Figure – 5 -** : The Relation between The [+] Spaces , [-] Anti-Spaces , [+ -] Sub-Spaces

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

of **Euclidean** & **Material-Geometry** in a circle (R,OA) of Three-Dimensions.
In (1) , The Euclidean Geometry , E-G , is defined upon the ***Number of Points***
which can define the  Specific Space  **i.e.**

The → **One-Point** in E-G  is defining ***One-Material-Point-Space*** , the M-P-S .

The → **Two-Points**  are defining the ***Line-Segment-Space*** , the   Line-M-P-S .

The → **Three-Points**  are defining the ***Plane-Triangle-Space*** , the Plane-M-P-S ..

The → **Four-Points**  are defining the ***Volume Tetrahedron-Space*** , the Volume-M-P-S .

The → **Five-Points** are defining the Volume ***Regular Pentahedron-Space*** the SV-M-P-S.

and so on , representing the **Steady-Stable-Regular** Geometrical-Formations.

The corresponding to the  **Material-Geometry-Units**  are for :

1.. One-Point → Two-Units , [⊕],[⊖] with Dimension as , ***the Material-Vector*** [⊕→ ⊖]

2.. Two-Points  → Four-Units , [⊕],[⊖] with  One Dimension as , ***the Material-Line***

3.. Three-Points → Six-Units ,   [⊕],[⊖] with Two Dimension as , ***the Material-Plane***

4.. Four-Points → Eight-Units , [⊕],[⊖] with Three Dimension as ***the Material-Volume***

Keeping ***the Property of Edge-Points*** to be the Vector ⊕ → ⊖ then **Bond is the**
**Potential** to the **Unique-Steady-Stable-Regular** Material-Geometry-Formations.

In (2-3-4-5). All Units in Vectors follow Quaternion  $q = [s+\bar{v}.i] = \overline{AB}$ Properties **i.e.**

[⊕] → the Positive constituent of Quaternion at , Point  A .

[⊖] → the Negative constituent of Quaternion at , Point B .

Pythagorean relation  $[R]^2 = [a_n]^2 + [\frac{\lambda_n}{2}]^2$ .

In Euclidean-Geometry E-vector $\overline{AB}$ carries **Point A to Point** B as , Vector A → B

In Material-Geometry M-vector $\overline{AB}$ **carries Energy** , ⊕ **, from Point A** to ⊖ ,

**Energy of Point B**  as , ⊕ **moves to** ⊖ , which is as ***The Periodic - Pattern*** .

Velocity $\bar{v}$ = The rate of change  ( m / s ) in AB , **Therefore Units are Formatted**

according to the ***Steady-Material-Geometry-Formations*** which are  **:**

The **Line-Vector in cave** , r ,which is the Simplest with **Double number of 4-Units**

The **Plane-Regular-Triangle in Orbits** , is the most Stable Shape of **6-Plane-Units**

The **Volume-Regular-Tetrahedron in Space** is the most Stable Shape of **8-Volume**

**Units** , ***the Cube*** , which are the Crystals . The Regular n-Hedron are for all others .

This is the Why The Glue-Bond , **Bond is the Potential ,** between the 6-Units formulates

the **Regular-Hexagon** as the First **Steady - Plane - Formulation** in nature as in Fig-18-
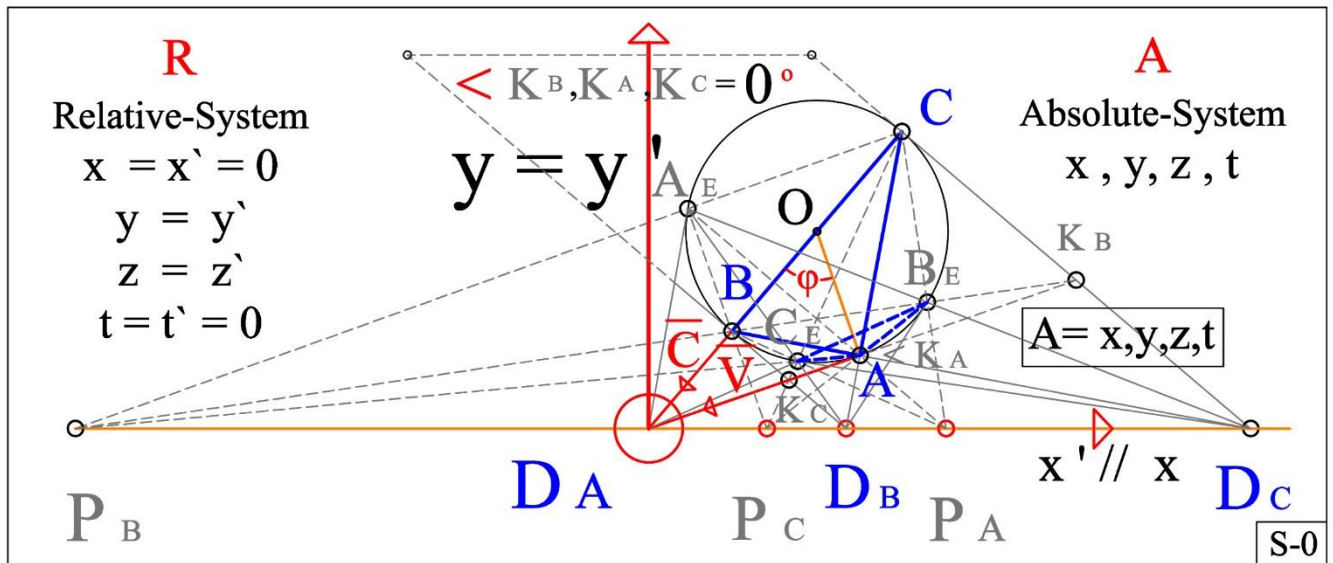
**Remark :**

The **Constraint ,** that Strain accompanying the Stresses $s_x$ , $s_y$ remains **Geometrically**

**Continuous** is , because  the Material Point is consisted of the two Units  ⊕  ,  ⊖ .only

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**8..[a].. The { STPL } Physical Mechanisms** : *The Six Triple Points Line Mechanism* .



**Figure -6-** : **The  Physical Three – Phase - Mechanism , Producing  The Fundamental Particles and the Primary Forces IN** Absolute System  **A ≡ R . γ = R. sec φ**. [97]

In –Fig. **ABC** is any Right-angled Triangle at , A = (The-Space) , $K_A K_B K_C$ = Triangle is the (Anti-Space) ,, $A_E B_E C_E$ = Triangle is the (Sub-Space) respectively. The Instaneous Pole **P** of Rotation is off the Circle of diameter |BC| . The Poles of Rotation lie on {$D_A$- $P_A$} Reference System .The **Reference System** {$D_A$- $P_A$}≡ [**R**] (x' , y', z', t') *moves with velocity* **v̄,** *Parallel to ,* x - x', *Axis with respect to the Fixed  and* **Absolute System** {$D_A$- O} ≡ [**S**]-(x , y , z , t ) .

*The Geometrical expression of Lorentz  factor* $γ = \frac{c}{v}$, *is the*  **sec φ = γ = O$D_A$ : A$D_A$ = ±**

**1 / [ √1– (v/c) ² ] = c / [√c² – v²]** , which is the Conchoidal of Nicomedes {s = a + b. sec φ}

and which acquires the material Angle   , $φ = \frac{v}{\sqrt{c^2 - r^2}}$  ,  **i.e. issues |A| ≡ |R| . γ**

**[a]-1…The [STPL] line is an Extreme - Spaces–Physical -Originating-Wave  Pattern .**

**Extreme-Spaces** (are the Extreme **Space-Triangles ABC≡ ⊕**) **meet Anti-Spaces** (Extreme **Anti-Space-Triangles** , $K_A K_B K_C$≡ ⊖ ) **through** The **Only-Gateway** which is the Circularly Charged **+ , 0 , -** , or [ ⊕ ∅ ⊖ ],[ ⊖ ∅ ⊕ ],[ ⊕ ⊖ ∅ ] Formulation which is a **Physical** Geometrical formation - **Mechanism  called The [STPL] line .** Figures-[ 6 ,7 ]

→ **The [STPL] - line** is a **Physical – Mechanism as**  , In-circle ⇒ Triangle ⇒ Ex-circle ⇒ Ex - Triangle consisted from  The Three Spaces , On which the Three Breakages [ s² = ⊕  , 2s ² = ∅  , - s ² = ⊖ ] are **Circularly- Charged** On the **Three – Extreme - Triangles** {A B C} , {$K_A K_B K_C$} , {$A_E$ $B_E$ $C_E$} ← Producing The Energy-Quantities ± $Q_{p-p}$ **. This Circular-Charge from Breakages**

26
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**On The-Three -Triangles is the THRUST** upon **The Energy-Quantity Produced** , for Each needed Circular Charge **, To** Shake Off **Quantity $Q_{p-p}$ . The 3-**Circular Charges correspond to the 3-Phase Rotors Produce the **3-Phase Physical-Current ,**

> Since *Common Circle exists on their Common - Sphere* , THEN **the Infinite**
> **Straight- lines** , **Launch The E - Quantity $Q_{p-p}$** OFF the **Fundamental**
> **Particles to all Universe and** INTO *The Planck`s Confinement* **Only** .
>
> <div align="center">

**i.e.**

The Physical-Three-Phase- STPL Mechanism is the only *Absolute-System* [**A**] On which circularly exist the *Relative-System* [**R**] $\equiv$ [ $\oplus$ $\varnothing$ $\ominus$ ] $\circlearrowleft$ [ $\ominus$ $\varnothing$ $\oplus$ ] $\circlearrowleft$ [ $\oplus$ $\ominus$ $\varnothing$ ] of The three constituents [ $\oplus$ $\varnothing$ $\ominus$ ] , which Produces The Fundamental Particles and The Existing Objectivity as **[A]** $\equiv$ **[R].**$\gamma$ , where $\gamma = \sec \varphi = [\frac{OD_A}{AD_A}] = \pm [\frac{1}{\sqrt{1-(v/c)^2}}] = [\frac{c}{\sqrt{c^2-v^2}}]$

**The material** Angle $\varphi = \frac{v}{\sqrt{c^2-r^2}}$ , and $\{A \equiv D_A- O\} \equiv \{R \equiv D_A-P_A\}. \gamma$ , or $|A| \equiv |R| . \gamma$

> **The Euclidean Geometry** is the **SPRING ,** for the Geometrical **Relative -Velocities** .

**When the Points [ A , B , C ] , [$A_E, B_E, C_E$]** , **[ $K_A, K_B , K_C$ ]** *are Applied on the three lines* **($K_A K_B$ , $K_B K_C$ ,$K_C K_A$) ,** *then the* **SIX** *Pairs of the corresponding lines , extended are concurrent at Points* $P_A$ , $P_B$ , $P_C$ *for the Triple Pairs of lines (* The Pascal`s Perspectivity of Points in Euclidean Geometry **)** , **[ $AA_E, BC_E, CB_E$ ]** , **[$BB_E, CA_E, AC_E$]** , **[$CC_E, AB_E, BA_E$]** *and at Points* $D_A$ , $D_B$ , $D_C$ *for the Triple Pairs of Lines* **[$K_B K_C$ , BC , $B_E C_E$]** , **[$K_A K_C$ ,AC ,$A_E C_E$]** **and [$K_A K_B$ , AB , $A_E B_E$] , (** Desargues`s Perspectivity of Points in Euclidean Geometry **)** *and all the 18 common Points lie on a Straight line The* $\Rightarrow$ STPL Mechanism

> **This Mechanism Stabilizes the Nucleus Forces** for the$\{ \oplus$ - **Space** [ A B C] $\}$ and for the $\{\ominus$ - **Anti-Space** [ $K_A$ $K_B$ $K_C$ ]$\}$ and this succeeded by *The Pascal`s* –launched caves **r** through the **STPL Circuit** of the **Ptolemy`s and** the **Ceba`s Geometry theorem** for *The Complex Vector - Forces* which are , *Circularly* and *Diagonally Equilibrium* .i.e.
> $\rightarrow$ **STPL is The *In-Sphere , Tetrahedron-Cube , Out-Sphere* Physical Mechanism** $\leftarrow$
> **For its 27-Conductors $\equiv$ Electric - Magnetic Fields** , Space-Energy **CPT** is **invariant .**

**8..[a]-2…The Explanation of The Absolute and Relative Motion.** . Fig – 6

Because Properties In and On [STPL] line , are relative to the only one Equilibrium and also
> **Absolute System** $\pm \Lambda = r.m\overline{v} = r.m.\overline{w}.r = mr^2.\overline{w}$ , so exists that what is called Relativity.
> **Absolute System** let it be the **[A]** $\equiv$ {$D_A$- O} $\equiv$ The STPL mechanism , and as
> **Relative System** ( Reference , Affine ) **[R]** $\equiv$ {$D_A$- O}

The Absolute motion happens on [**A**] $\equiv$ {$D_A$- O} and on [**R**] $\equiv$ {$D_A$-$P_A$} of the two Systems . It was shown , that in {$D_A$- O}, (x ,y ,z , t ) , System $\overline{c}$ , $\overline{v}$ **,** vectors are isochrones i.e. Period T = L / V = 2$\pi$R/V = 2$\pi$ / [c/$r_c$] = 2$\pi$/[v/$r_c$] $\rightarrow$ c/$r_c$ = v/$r_v$ $\rightarrow$ c.$r_v$= v. $r_c$ , where $r_v$ , $r_c$ are the radius of their intrinsic rolling circles . This relation is Geometrically expressed as ,
> **sec $\varphi$** = O $D_A$ : A $D_A$ = $\gamma$ = $\frac{c}{v}$ = $\pm$ **1** / [ $\sqrt{}$**1–(v/c)** $^2$] = c / [$\sqrt{}$ c² – v²] , and it is a

<div align="center">27</div>
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

Geometrical Cycloid Property equal to Lorentz`s , $\gamma$ , factor . The Newton`s laws are true into the Reference System $[R] \equiv \{D_A\text{-} P_A\}$ as follows Proof ,

Considering $\{ D_A\text{-} O\}, (x , y , z , t )$ , as the **Fixed frame [A]** of the coordinate System in the Gravity cave $(d = 2r)$ , and Point $A = (x, y , z)$ is **fixed on circle (O,OA)** which is Rotating with a velocity $\bar{v} = \overline{w}r$ , of angular velocity $\overline{w} = 2\pi /T = 2\pi f$ , in where Period of Rotation T , **is then also constant** .

Since the acceleration , a, for a Quaternion $z = (s + \bar{v}. i)$ is $a = [d^2z/dt^2] = (ds/dt.\bar{v}.⬚i) + s. d(\bar{v}. i)/dt = 0 + s. d(w r)/dt = 0 + 0$ , *and this because $\overline{w}$ is constant for both* therefore **velocity $\bar{v}$ = constant** also , **i.e. $\rightarrow$**

*The Centrifugal velocity of the Absolute System [ A ] is any constant , $\bar{c}$ , and this because Angular velocity , $\overline{w}$ , is constant also and thus , is not needed to accept A priori this constancy of velocity $\bar{c} = 0 \rightarrow \bar{v} \rightarrow \infty$ on circle (O, OA) and to exist In Frame* , ( It has been Proved that this velocity $\bar{v} \equiv \pm \sigma \Phi$ ) so ,

Automatically *is defined the conversion factor* **t = time** , between the conventional time units (second) and the length units (meter = $A.D_A$) or as $\bar{c}. r_v = \bar{v}. r_c$ , $\rightarrow \bar{c} (v)(T/2\pi) = \bar{v}(c).(T/2\pi)$ $\rightarrow \bar{c}(v)/w = \bar{v}(c) / w$ , which is happening with the same **w** , without setting any restrictions , in contradiction to the General Relativity which is an axiom a priori . Additional ,

*This is the why that the conversion factor , t = time , has not any essence in all universe but it is only a meter of changes in all Relative Systems .* **STPL Mechanism is the only Absolute System On which circularly exist** $[ \oplus \; \varnothing \; \ominus ], [ \ominus \; \varnothing \; \oplus ], [ \oplus \; \ominus \; \varnothing ]$ , **the three constituents ,** $[ \oplus \; \varnothing \; \ominus ]$ , **and Originates this Existing - Objective - Cosmos .**

This **circularity** of the constitutes exist because of their Natural frequency of vibrations .

Because [STPL] line of the fixed frame becomes from this System [A] , then this relative Frame [R} is common to the fixed one (common $D_A$) and let it be $[R] \equiv (x' , y' , z' , t')$ .

From figure , $\sin \varphi = (\bar{v} / \bar{c})$ , meaning that the Relative System , $[R] \equiv (x' , y' , z', t')$ , ( the Affine Frame) is the Projection of Absolute Frame $[A] \equiv \{D_A\text{-}O\} - (x , y , z , t)$ where exists as the Simultaneity for all motions where issues ,

$$[R] \equiv \{D_A\text{-} A\} \equiv [ (x' , y' , z' , t') ] ,$$
$$[A] \equiv \{D_A\text{-} O\} \equiv (x , y , z , t) = [R] .\gamma \equiv ( x' , y' , z', t' ) . \gamma$$

Considering Point $D_A$ as the common center and [STPL] as the x-x axis of the two Systems ,

then becomes $D_A ( x , y=y ', z = z', t)$ and for all linear Systems $D_A ( x', y'= y , z '= z , t' )$

This Specific state of constancy , i.e., the Centrifugal velocity of Absolute System [A] to be a constant $\bar{c}$, and the rectilinear motion with respect to one another defines the natural Inertial frames , and because of uniformity of Space and motion , therefore occupies the same meter for their changes , (i.e. the Time) .

Since also Points O , A remove to Point $D_A$ isochrones by their intrinsic Property motion which are $\rightarrow$ their wavelengths are a Stationary wave in cycloid $\leftarrow$ following Lorentz`s factor $\gamma$ , then this following happens also to all Frames which make this motion , and so issues for all the System relations $\{ D_A - O \} = \gamma . \{ D_A - A \}$ . Fig-6

On this Relative System $D_A( x', y' = y, z' = z , t`)$ are conveyed , the Breakages $[ \pm (wr)^2 , 2(wr)^2 ]$ of (O,OA) circle after the colliding with the rotating velocity $\bar{v} = \overline{w}.r$ of the [A] System , and are the Fundamental Particles , Fermions and Bosons, or by escaping consisting the Rest Field and Gravity , or Dark matter and Dark Energy as analytically was shown .[39]

28

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

The Angular-Momentum Ellipsoid Nibs on →{ Herpolhode and Polhode Ellipsoids}. **In any Rotational motion ,** $\overline{B}x\overline{w}$ are Constants and **The Angular-velocity**-vector **$\overline{w}$ ,** describes the Ellipsoid of Angular Velocity and its nib describes a Cone of which Plane-Base is Fixed . Simultaneously .**The Angular-Momentum $\overline{B}$** describes the Ellipsoid of Angular Momentum and its nib describes a Cone also of which Plane-Base is also Fixed . **The Nib of Angular - velocity-vector , $\overline{w}$** , describes on the Tangential-Plane of the Angular-Momentum Ellipsoid , **the Polhode** , while **The Nib of Angular-Momentum $\overline{B}$** , describes on the Tangential-Plane , of the Angular – Velocity - Ellipsoid , **the Herpolhode** . or **The Fixed Tangential-Planes on $\overline{w}$ , $\overline{B}$ nibs** which are alternately Perpendicular to $\overline{B}$ , and $\overline{w}$ , common Central Axes of Rotation , **or The *Angular-Momentum Ellipsoid Nibs , in* Herpolhode *and on* Polhode *Ellipsoids* as → Electro magnetic Fields ←** and which are Space-Energy **CPT** invariants .

The moving Energy-Vector is $|\oplus \mathbf{Q} \Uparrow \overrightarrow{AK_A}| = |\updownarrow| \rightarrow$ { The Electron-Unit-Charge }, and

since Charges correspond to the 3-Phase Rotors is ,**The Unit-Charge Complex-Vector**.

**Remarks :**

**Material Point** $A \equiv \pm |(\overline{w}.r)^2|$ of the Fixed System {$D_A$- O} travels with velocity $\overline{v}$ at Point $D_A$ , so geometrical distance $A.D_A$ in the Relative System [R] $\equiv$ {$D_A$- $P_A$} is $A.D_A = x'+ \overline{v} t'$, and because of the **Isochrones motion** in the **Fixed System** [A] $\equiv$ {$D_A$- O} , then holds ,

$\quad x = (x'+ \overline{v}.t') .\gamma$ or $\quad \mathbf{x} = (x'+ \overline{v}.t').\gamma \equiv [ x'+ \overline{v}.t'] / [\sqrt{1-(v/c)^2}]$ ……. **(a)**

**Inversely** , by using (a) , where [A] $\equiv$ { $D_A$-A} $\equiv$ {$D_A$- O}/ $\gamma$ , then if Material Point A of the Fixed - System { $D_A$- O} travels with velocity $\overline{v}$ at Point $D_A$ , where then the geometrical distance $AD_A$ in the Fixed System is ,

[**A**] $\equiv$ {$D_A$ - O} is → $A.D_A = x - \overline{v}.t$ and in the Relative System ,

[**R**] $\equiv$ { $D_A$- $P_A$} is → $x' = (x-v\,t).\gamma = [x-v\,t] : [\sqrt{1 - (v/c)^2}]$ …...**(b)** Fig-6

An application to Gravity [72] and Photon [95] ,

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

$\overline{q} = \dfrac{G}{c\sqrt{2}} = \dfrac{6,680561 .10^{-11}}{1,41429.[2,9979346.10^{\,8}]} = 1,58.10^{-19}$ Coulomb , which is the known Coulomb`s

**charge Quantity .** From $g_L, k_L$ Universal constants the Newton`s Gravitational constant Force $\mathbf{G} \equiv g.k_E \equiv g .[g_L\, k_L] \equiv [\dfrac{T^2 P}{a^3}].[g_L\, k_L] \equiv 9,808238* 6,8116.10^{-12} \equiv 6,68056.10^{-11}\, \dfrac{m^3}{Ns^2}$

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 $\equiv (\dfrac{v}{2\pi r})$ . $[\sigma + \sigma \Phi] =$ $\overline{v}$ . $[ \dfrac{\sigma}{2\pi r} + \dfrac{\sigma\Phi}{2\pi r} ] \equiv \overline{v}$ . $[.\boxed{\overline{f_n}}$ $+ \mathbf{f_n} ] \equiv$ Moving - Storage →$[ \overline{v} .\boxed{\overline{f_n}}$ ] ← + Moving-Frequency → $[ \overline{v}.\mathbf{f_n} ]$ ← $\equiv$ The Material-Point . **i.e.**

**The Energy** Produced in **Photon-Cave** is consisted of **Two-moving-Storages** , that travel <u>as</u> **Wave** $[\overline{v}.\mathbf{f_n}] \rightarrow [ \overline{v} .\boxed{\overline{f_n}}$ ] → $[ \overline{v} = \overline{c} = \lambda\dfrac{f}{\Phi} ] \rightarrow [ S \equiv EM\text{-}R \equiv f_{1=N} , f_2 , f_3, f_D ,, f_n= w^2 ]$ , and <u>as</u> **Particle** →$[ f_1= (E^2+H^2) = n \dfrac{(1+\sqrt{5})\sigma}{2\pi r} = \dfrac{n\overline{B}}{\pi^2\, r^4}] \rightarrow \{W \equiv EM\text{-}R \equiv [\varepsilon E^2 + \mu B^2] = 2.\lambda c.\sin 2\varphi\}$ and is **The Duality** of the **Energy-Storage** $S \equiv \{ \boxed{[\oplus \leftarrow\, r\, \rightarrow \ominus]}$ + **Motion M** . [87-89] .The three elements $[\Sigma = n . h] \Rightarrow [s^2 = \oplus$ , $2s^2=\varnothing$ , $- s^2 = \ominus]$ of This **{STPL}-Mechanism** formulate the **3**-Knots Figures ( n = 3 ) and determinates the **Elementary-Particles Vector Mould .**
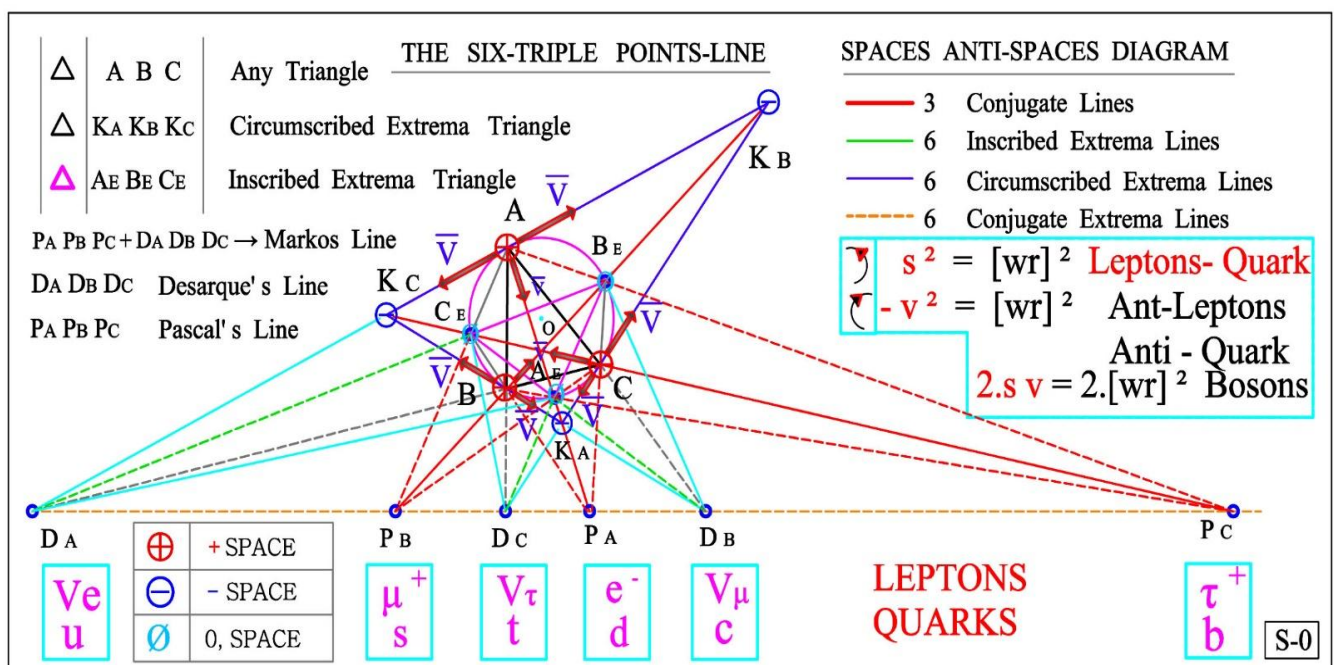
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

8.[a]-3..The circularly existing Unit-Charge **Complex-Vector** [$\oplus \varnothing \ominus$],[$\ominus \varnothing \oplus$],[$\oplus \ominus \varnothing$],
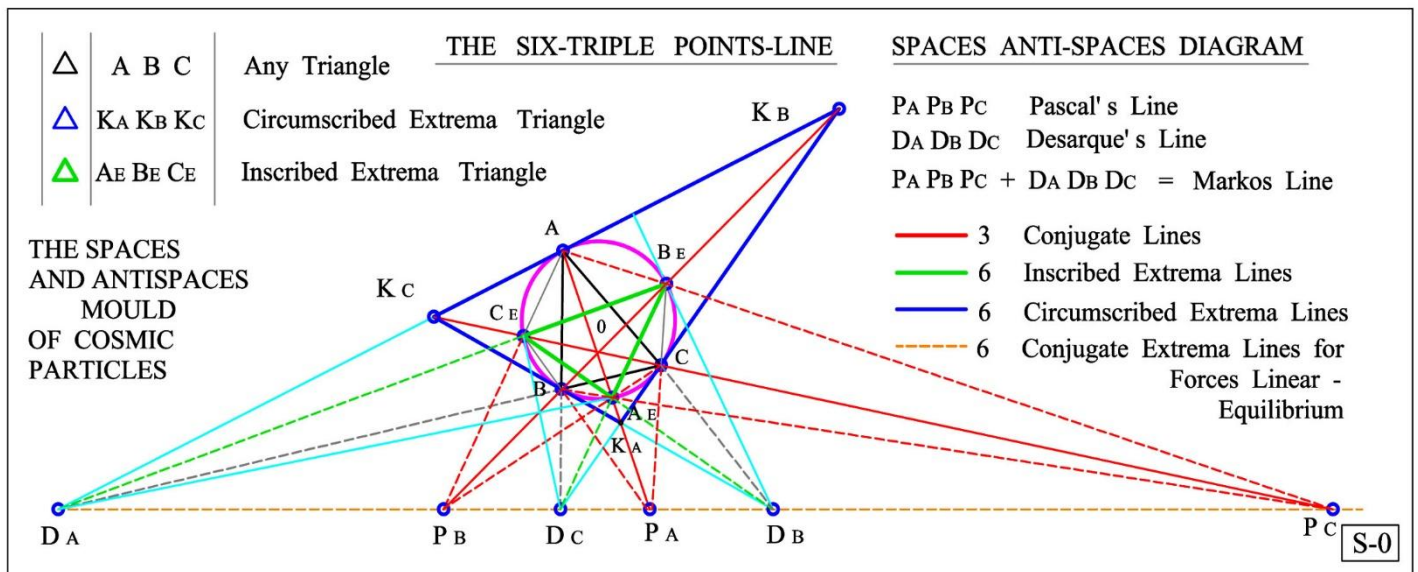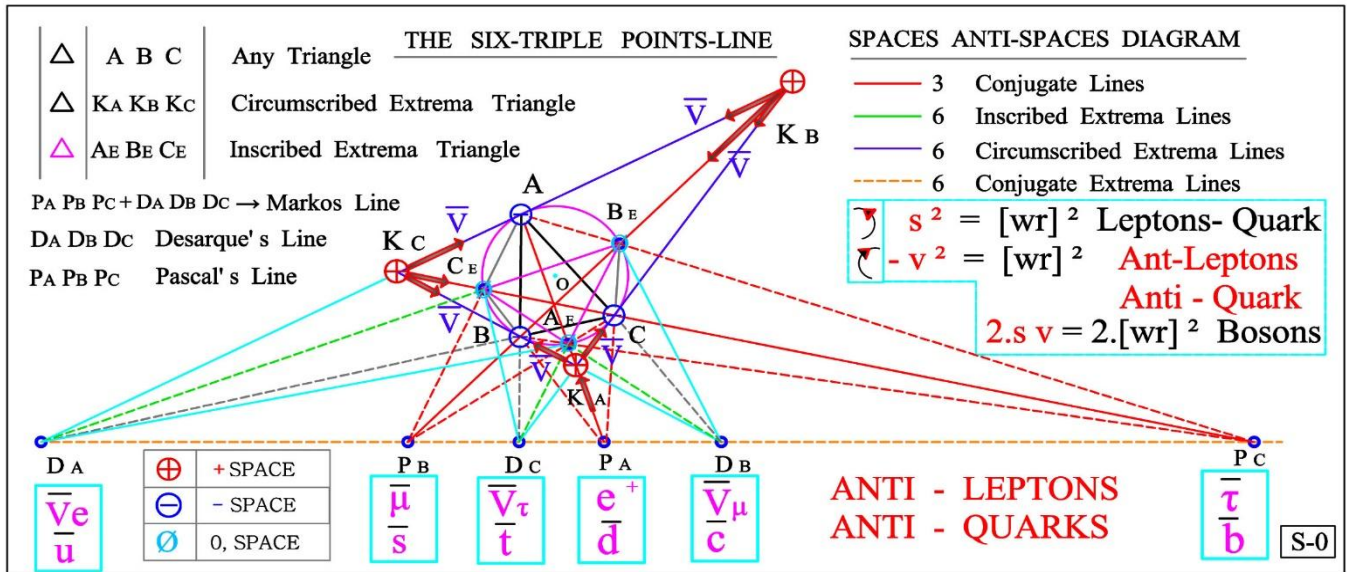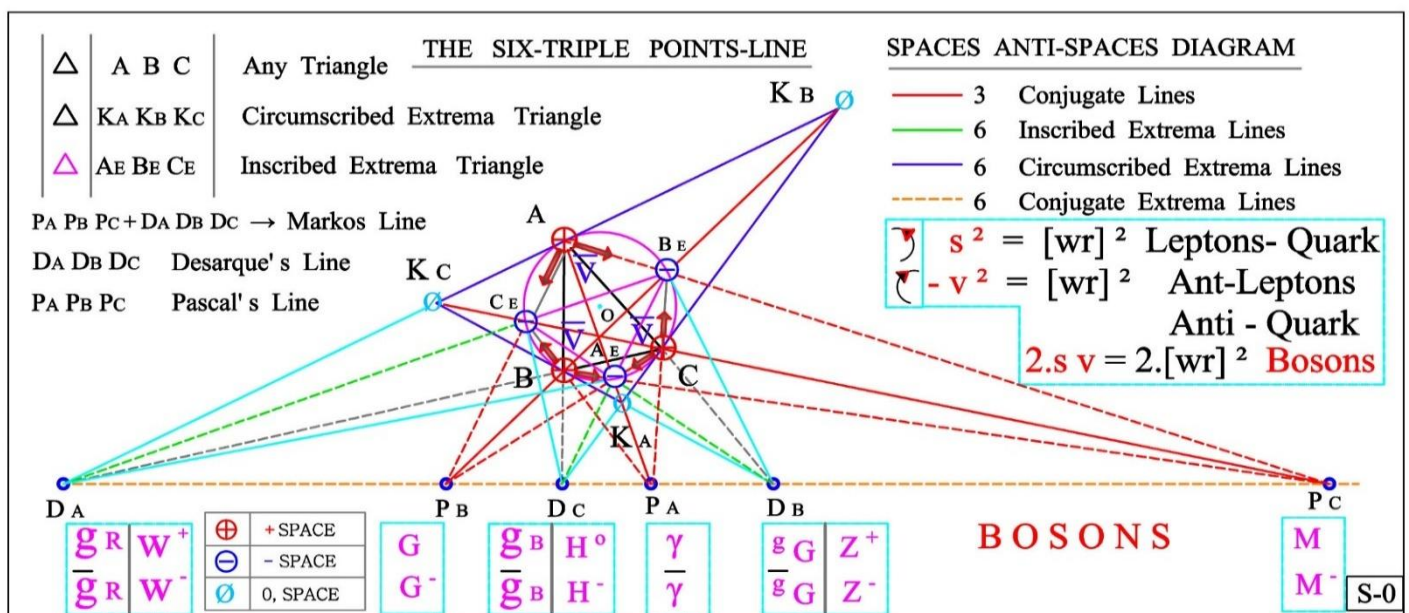


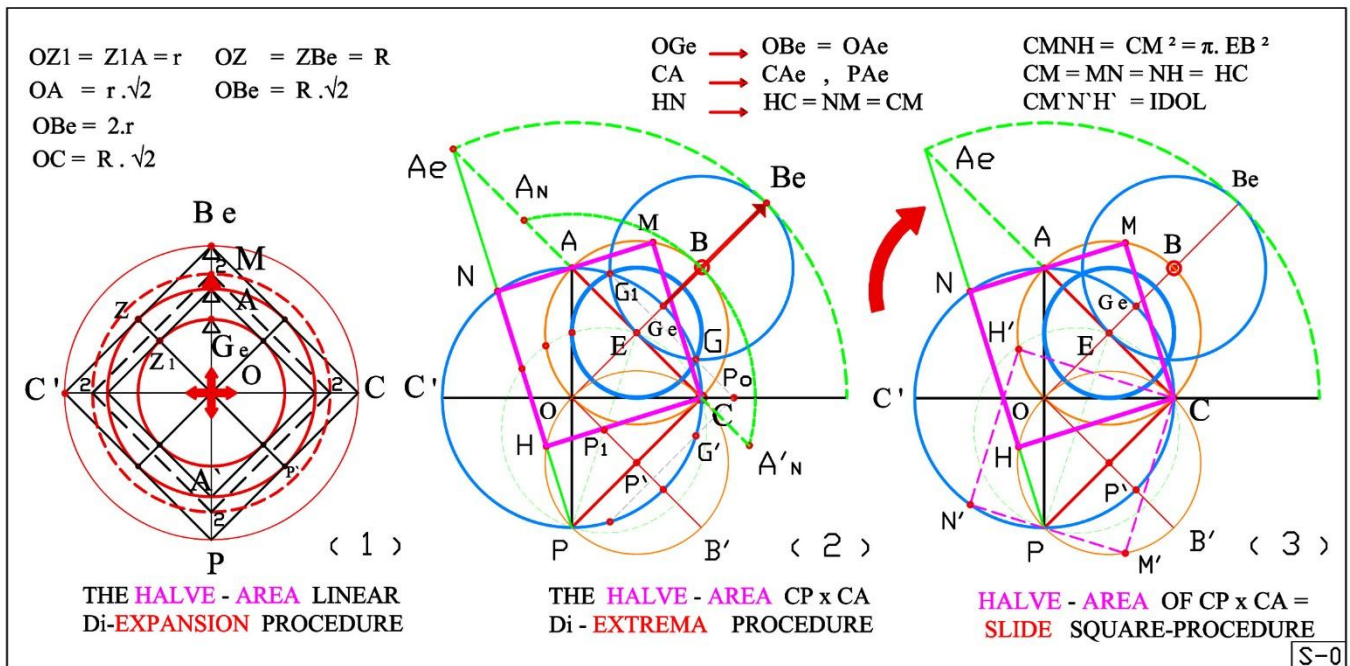**Figure - 7 - :** The , **STPL** , Mechanism is the Generator of the Cosmic-Particles .

**The Unit-Charge** is as **Complex-Vector Velocity Thrust** ( $\bar{v} = \bar{w}.r$ ) ,

with and from the **Breakages** $\rightarrow$ $\vec{z} * \vec{z}$ $= (s + \bar{v}.i )^2 = s^2 + [\bar{v}]^2 + 2.s\bar{v}.i$ .

**7-a = The Positive Breakage Quantity Q ≡ [ $\oplus$ $\varnothing$ $\ominus$ ] , for Leptons and Quarks .**



**Figure –7- a :** The , **STPL** , Mechanism is the Generator of the Cosmic-Particles .

**The Unit-Charge** is as **Complex-Vector Velocity Thrust** ( $\bar{v} = \bar{w}.r$ ) , with

and from the **Breakages** $\rightarrow$ $\vec{z} * \vec{z}$ $= (s + \bar{v}.i )^2 = s^2 + [\bar{v}]^2 + 2.s\bar{v}.i$ . **V-Trust** ≡ [ $\oplus$ $\varnothing$ $\ominus$ ]

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**7-b = The Positive Breakage Quantity  Q ≡ [⊖ ∅ ⊕] , for Anti-Leptons , Anti-Quarks .**



**Figure -7- b   :**   The , **STPL** , Mechanism is the Generator of the Cosmic-Particles .

**The Unit-Charge** is as **Complex-Vector  Velocity Thrust** ( $\bar{v} = \bar{w}.r$ ) , with

and from the  **Breakages** → $\vec{z} * \vec{z} = (s + \bar{v}.i)^2 = s^2 + [\bar{v}]^2 + 2.s\bar{v}.i$ . **V - Trust** ≡ [⊖ ∅ ⊕]

**7-c = The Positive Breakage Quantity  Q ≡ [⊕ ⊖ ∅] , for Bosons Origination  .**



**Figure -7- c   :**   The , **STPL** , Mechanism is the Generator of the Cosmic-Particles .

**The Unit-Charge** is as **Complex-Vector  Velocity Thrust** ( $\bar{v} = \bar{w}.r$ ) , with

and from the  **Breakages** → $\vec{z} * \vec{z} = (s + \bar{v}.i)^2 = s^2 + [\bar{v}]^2 + 2.s\bar{v}.i$ . **V - Trust** ≡ [⊕ ⊖ ∅] ,

Since the Primary motion ≡ [**PM**] exist from the three **Breakages** only , and **STPL** is the
**n** =3 Mechanism creating Elementary Particles ⇒ [**n-Knots=3**] in **V** GRA = 7,593.10³⁵ **V**.

31
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

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8..**[b]..** The **{ TVPM }** **Physical Mechanisms** : *Two - Vectors  Three - Poles Mechanism* .



**Figure -8- a :** The Two-Perpendicular Complex-Vectors , CA ⊥ CP , Slide on (O,OA) circle , and through the Three  Poles , A , C , P , carry the Stress **σ** , of Square , ACPC', to the Two Equal and  Opposite Squares |COAB| , |COPB'| for **Halve Area - Stress** - Conservation

**b-1...** The **Conservation** of **Energy IN Geometry** - **Mechanism**  :  [62]

**In(1)…**On AA` diameter circle (O,OA) exists the Inscribed -Square OA x OA = OA², and the Circumscribed  Square CP x CP = CP². Since Vector  CP = [OC= OA].$\sqrt{2}$ , therefore the Inscribed **Square** is **Halve**  the  Circumscribed . The same to the Circles  $\pi \left[\frac{CP}{\sqrt{2}}\right]^2 = \pi [CP]^2 = \pi [OA.\sqrt{2}]^2 =$ 2.$\pi$ [OA]² . **This Linear Expansion** of Archimedes-Circles and Squares Passes from a Point M , such that  **π r ² = CMNH** Square . [ 47 - 51 ]

**In(2)**... On Two-Perpendicular Vectors , CA ⊥ CP , Point C` Slides on (O,OA = OP) circle forming the CAC`P to CMNH to CBAO  Squares with Prior of (1) Properties .This **Sliding-Rotating Method** Is the  **Markos { 2 -Vectors 3 -Poles Mechanism }** which Circles and Squares as Areas Pass from the Point M determined by the Position **$A_e$ ,** such that  **π r ² = CMNH Square** .

The Squaring of the circle  $\pi \left[\frac{CA}{\sqrt{2}}\right]^2 =$  CM²  . [ 47 - 51 – 98A ]

**In(3)..**  If the Two-Perpendicular Vectors **Are Conductors** with Prior Properties then Square CAC`P to CMNH to CBAO  Square , are a **Rotating and Changing-Squares-System** , CP ² ↑ = |∷| ,↺, → To **2-Half** and  Equal Area Squares  CB ² = $\boxtimes$ =$\left[\oplus \frac{∷}{2} + \ominus \frac{∷}{2}\right]$ CB`² , by turns in  OABC ⊥ OPB`C Planes , which Equilibrium and Consist , The Neutral-Space . Placing **Stress** in Squares becomes the Physical World as , *Physics Mechanics* and *Chemistry* , by **Conservation of Energy** as **Stresses in Areas** .

**As in Electricity ,** *The flow of a current in an Conductor ,* CA = d , *Represents the created around the Conductor  by the Circular-Lines of Forces* , **Magnetic field** , *The flow of*  ⊕→⊖-*Charge in* **d**

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

***Conductor*** , is the Torsional Force $\overline{T}_F = \vec{v}.r = \overline{w}.r^2 = 2\pi f. r^2 = \sigma \Phi r$ …….(1) . Since edge-velocities $\overline{v}_C = \overline{v}_A = 0$ , therefore CA $=d= \frac{1}{2}(aT^2)$ and **Acceleration** , $a = 2d/T^2 = 2d.f^2$, and then the velocities diagram is Energy-Triangle $\rightarrow$ v.[$\Delta$-CAP] = v.[$\frac{1}{2}(2d. |\vec{v}|)$] = v.[d w r] = v d.$2\pi$f.r = **v.[σ Φ d]** ..(2)

The Current flow in Electric-Field $\overline{E}_{CAP}$ of CAP Plane is transported into the Perpendicular to CA axis Opposite Magnetic-Field $\overline{M}_{PA}$ in PA-Plane due to the **Force** $\overline{T}_F = \vec{v}.r = I = \frac{2\pi r}{\mu} \overline{M}_{PA} = \sigma \Phi r$ .(3)

Stress $\sigma = \frac{\text{Force}}{\text{Area}} = \frac{G}{v.v} = \frac{G}{\sqrt{2}.c} =$ The $\overline{q}$ $_{\text{Electron}}$ Charge $= \frac{G}{\sqrt{2}.c} = \frac{6,6736923 .10^{-11}}{1,41429.2,9979346.10^8} = 1,574.10^{-19}$ C

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

**i.e.** [a] **The Forces are Spread on Surfaces as Stresses σ ,** and in **case of Area = 0** then are
Spread on the Velocity – square – Surfaces , and for **the light c , on Resultant $\sqrt{2}.c$** .

**b-2...** For ***Conductor-Case*** which is an **Screw-motion** where a Torque is created in Perpendicular
Plane of Con-axis **.** Markos { **2-Vector 3-Poles Rotating Mechanism** },{ $\begin{smallmatrix} -A \\ +C \uparrow \end{smallmatrix}$ $\begin{smallmatrix} :: \circlearrowright \\ [\oplus \frac{::}{2} + \ominus \frac{::}{2}]P \end{smallmatrix}$ }

carries motion (+) $\rightarrow$ (-) from **Point A *through an Perpendicular-Conductor* CA** , to **Point B** , into an Changeable and Rotating-Squares-System , PA $\uparrow = |::|$ , $\circlearrowright$ , $\rightarrow$ To 2-Half and equal Area Squares CB = $\chi = \left[\oplus \frac{::}{2} + \ominus \frac{::}{2}\right]$ CB` , by turns in OABC $\perp$ OPB`C Planes which Equilibrium $\left[\oplus \frac{::}{2} + \ominus \frac{::}{2}\right] = 0$ (The Neutral-Space) .

**b-3..For the motion** of the $\oplus \rightarrow \ominus$-Charge of any Conductor d = CA becomes **Stress - σ** in length **d**
Motion is created in Conductors $\mathbf{d} \equiv \boxed{[\oplus \leftarrow 2r \rightarrow \ominus]}$ following the [$\oplus \leftrightarrow \ominus$] Interactions .This
Motion is Conserved and kept in Caves as **Electric and Magnetic fields** and as frequencies which are conserved in them when **the Space-Points** become Energy-Conductors and Energy $k = \frac{2\pi}{\lambda} = \frac{2\pi}{d}$ .

**b-4...**The in caves **Energy Imports** are in Squares which equilibrium through MPM $\equiv$ Markos of $\ominus$ **Charge** in an Electric–field $\overline{E}_F$ . For Velocity-Vectors at Point **C** issues , $\overrightarrow{CP} = \overrightarrow{CA}$ and $\overrightarrow{CP} \perp$ $\overrightarrow{CA}$ and the **Resultant is the Velocity-Vector** $\overleftrightarrow{CC}_{AP}$ **,** Electric-Vector $= \frac{\pi\sigma\Phi}{4}[d]^2$ , Magnetic-Vector $= \frac{\pi\sigma\Phi}{4}[d]^2$ . **Similarly** on Material Vector $\overleftrightarrow{CP}$ carries the **Maximum Conjugate-Force CC`=** $\overrightarrow{C}K_A$ from E-Square $CP^2$ to two Equal and Opposite squares – CB`PO ,+ CBAO from CAC`P $\equiv \frac{+COAB}{-COPB`}[\chi]$ which Rest in the Circumscribed circle $\pi.OA^2 = 2\pi(\frac{OA}{\sqrt{2}})^2$, to the ***Screwdriver*** Inscribed to , $\overrightarrow{CA}$ , $\overrightarrow{CD}$ circles , $\pi[\frac{CA^2}{4}]$ , $\pi[\frac{CP^2}{4}]$ . Motion to Rest , Before the Halve areas , circles Pass through the equal to **CMNH Square** where exist Quadrature at **Position M** and to Half-Area circle $\pi[\frac{OB}{\sqrt{2}}]^2 = \pi[\frac{OB^2}{2}]$ **at Position M**

**b-5..**This Property of **Any Two Equal and Perpendicular Vectors at Point C** , issues for any Point
**N** , which has a ***Screwdriver –Material - Vector-* CN .**

**The Quantization of E-Geometry to its Dimensional-moulds** :
***The- One , Two , Three Vectors and Three - Poles Mechanism*** .

33

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .
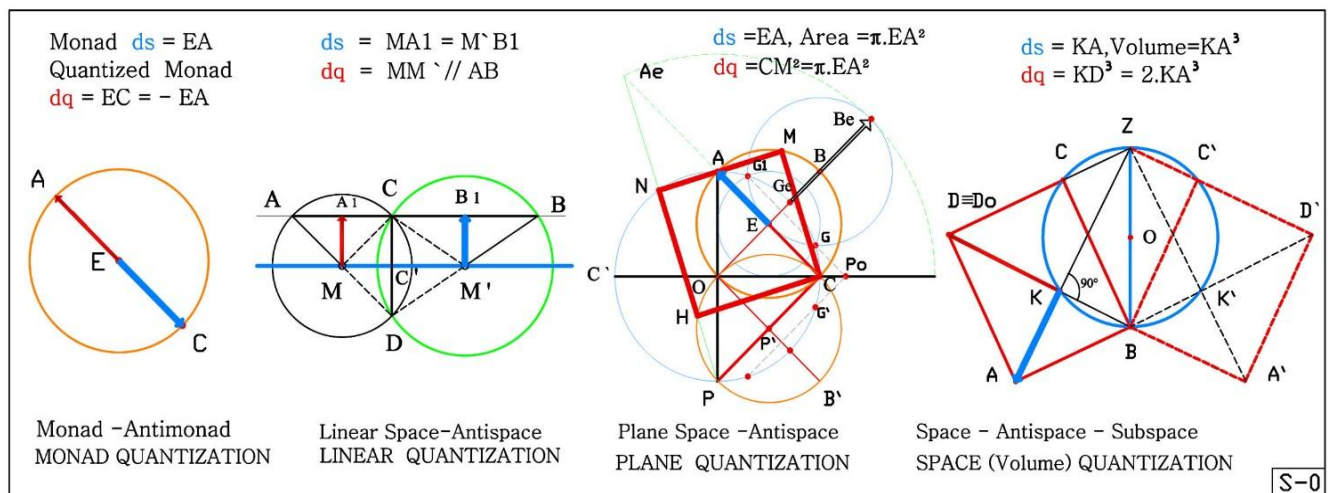
**Figure -8 - b   :**   The Quantization of E-Geometry to  its moulds , The Point , the Linear , the Plane , the Space (volume) Mould for E-geometry Quantization , to Opposite.

**b-6…**For (**1**)  monad  EA , to Antimonad  EC–For (**2**) AB line to Parallel line MM` - For (**3**) CE  Radius to the  CM  Square Segment - For (**4**)  KA  Segment  to the  KD  Cube  Segment .

From (3) the Two-Perpendicular Vectors , CA ⊥ CP , Slide on (O,OA) circle and through the Three Poles , A , C , P ,  carry the Stress **σ** , of Square  ACPC , To the Two Equal and Opposite  Squares  |COAB| , |COPB'|  for still  to the  **Halve Area - Stress** - Conservation .

For the **Rotating Square  CMNH**  exist as **Upper-Still-State** the Square  **CAC`P** and  as **Lower - Still-State** the Square  **CBAO ,** related  **[ CAC`P ] = 2.[ CBAO ]** .

**In(3)**..On Two-Perpendicular Vectors , CA ⊥ CP , Point C` Slides on (O,OA = OP) circle forming the  CAC`P to CMNH to CBAO  Squares with Prior of (1) Properties .This **Sliding Rotating Method** is **Markos** { **2-Vectors 3-Poles Mechanism** } which Circles and Squares as Areas Pass from the Point **M** determined by Position **A_e ,** such that issues  $\pi r^2 = CMNH$ Square .The Squaring of the circle is $\pi [\frac{CA}{\sqrt{2}}]^2 = CM^2 = |CM'|^2$ , Fig-15,  [ 47-51 ] , [62]

**Remarks :**

1… The *Two - Vectors  Three - Poles Mechanism* is a Mechanism from Two ⊥ Vectors in Geometry , where the Action of Energy on their Vectors Square and is **Conservated .**

2… The Mechanism is a **Rotating and Changing-Squares System** , on a Circle which  changes The Inscribed to the circle Square , changes to 2 –Halve Opposite and equal Squares .The same Procedure  issues for the **Inscribed  and  Circumscribed circles** to the Circle .

3… Since from **Wave-Action of  Spaces** issues   $Z_-^n \times Z_+^n = [2R]^{2n} . e^{i.2n\theta}$ , this means that ,The **conservation of Energy** = **Work** , between the Spaces and the Anti-Spaces happens by **Doubling the number n** , of the Vertices of the Regular Polygon . i.e. The Surplus energy is stored in 2.**n** vertices , and on $\lambda_{2n} = \sqrt{2R^2 - R\sqrt{4R^2 - \lambda_n^2}}$ Sides , where then Energy is divided and spread on the double number of the Polygon Sides.

**8..[c].. The { TCIC } Mechanism** : The *Tetrahedron , the Cube , and the Inscribed –*
*Circumscribed to the Circle  Mechanism .*
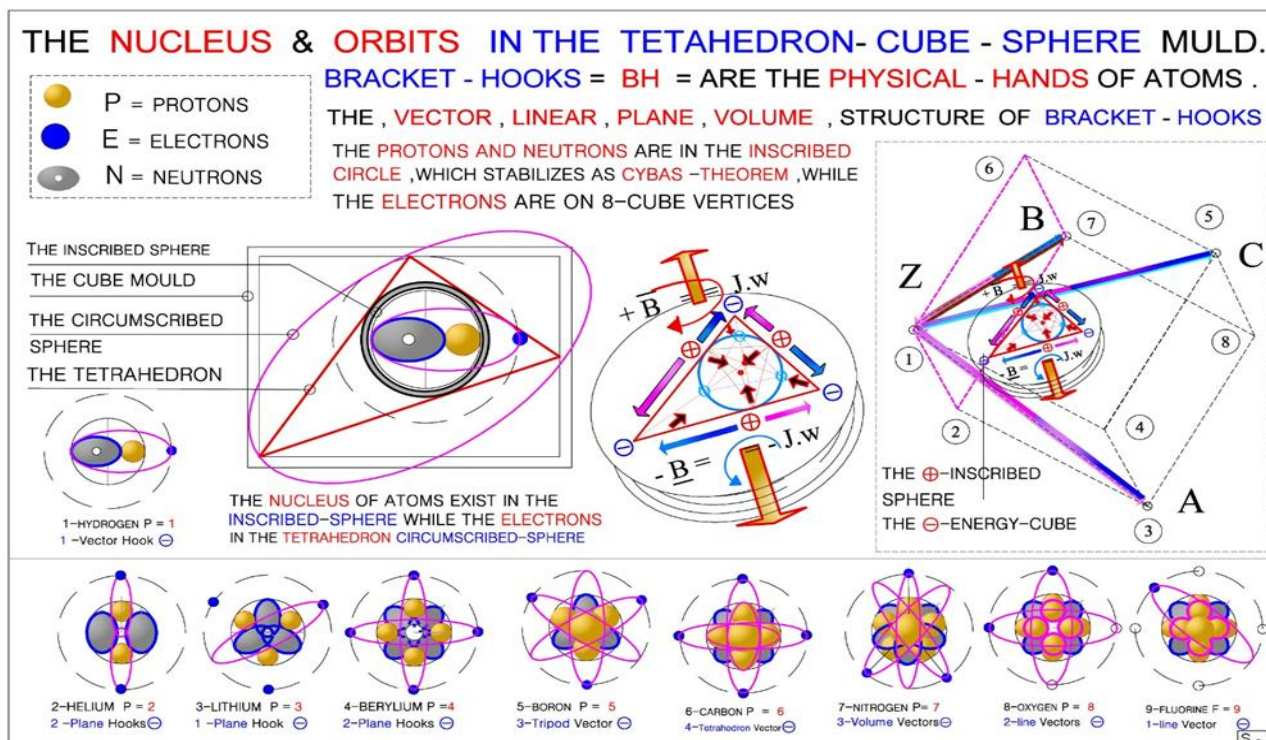


**Figure - 9-** : **The Active-Conductors of Elements and The Space , Anti-Space  formation** .
In Figure  **ZA , ZB , ZC ,**  are the three **Conductors** on  the Three Diagonals of  Cube
with 1 , 2 , 3 , 4 , 5 , 6 , 7, 8 , Vertices .  At Point  Z  is Acting a **Complex-Vector** $\bar{Z}$ and
which transform the Vibration to the three conductors in **Space Pattern** . It was shown
[61]  that The Stresses of Complex-Vectors are Spread in Surfaces only for Still states.

**The number of Moulds** of **Stationary-States** are → $2^{n=1-4 \text{ Points}} \equiv 2 , 4 ,8 ,16 \equiv$ **4–Types**←
(2) = For the **P**roton = Nucleus , (4) = Tetrahedron , (8) = Cube = The Neutral-caves , (16) =
The Double Number of Vertices for the 8-Stationary Neutral-caves and called **TCIC-Pattern**
→{  **The Sphere – IN TETRAHEDRON – IN Cube , IN External  Sphere** }←
The Active-Conductors of Elements and The Space , Anti-Space  formation .
Point , in E-geometry is considered nothing , without Position and direction while in , MG ≡
*Material - Geometry* [1 Positive ⊕ and 1 Negative ⊖] . From Nothing (i.e. the Point Z ) to
Existence ( i.e. to be another Spherical Point P ) issues the **Zero Virtual work law** ,where
zero Work is the equilibrium of two Equal and Opposite forces on Points and is [⊕ - d - ⊖] .
Thus Space [S] is **Z**-Point ⊕ , Anti-space **P**-Point ⊖ , and  d = **ZP** = The Conductor of Points
Since ,*The Position and the Number of Points*, create  the Spaces so the Only Three elements
**are**  → {⊕ , [⊕↔⊖] , ⊖} ≡ [+, 0 , -] ← **for  Material Geometry exist linearly** in moulds .
The Stresses of Complex-Vectors **Act** on a Surface , **A circle of Sphere** , between the Sub
Units **Axially** and **Rotationally** following Ptolemy`s and  Cebas Theorem of Equilibrium**.**
The Space Anti-Space  and , Neutral-Space Conductors are self-Sustaining .
**Stability  :**

35
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

The number of Moulds of **Stationary-States** are as→ $2^{n=1-4 \text{ Points}} \equiv$ 2 ,4 ,8 ,16 $\equiv$ **4–Types**←
   **i.e.** Monads are formed  from the first **4- Moulds** as → The 1-Point which is  everywhere,
   the  2- Points which form Vectors , the 3- Points which form the Planes , the 4 - Points
   which form the Volumes . For  n > 4 as this is the Atoms Structure, follows the
   Sustainability of the Spaces and Anti-spaces. Since Space-Energy Structures follow the
   M-Geometry Stability these follow the Mould of Spaces  $2^{n=3}=8$  Elements which is
   **The-Cube** as shown before **.** Instances ,

**1..** In the constant , **Hydrogen Conservative-Cave-System ,** which creates only closed Orbit
   shapes as Circles , Ellipses and Eight-shape , $\infty$ , are Placed the above elements , $\boldsymbol{\pi}$ **g** $\equiv$
   **Energy** $\equiv$ [*meter* **of** *area* * *meter of force*] $\equiv$ *Electrons on Orbits* , and also the
   **Unit-Space** $\equiv$ *Massive-Complex-Unit-Space* $\equiv$ →$[+\bar{\mathbf{v}}.\mathbf{s^2}]$← jointed through the Neutral
   Material-Points [ (+) [$\leftrightarrow$] (-)]  with the ***Strong-force*** → $S_F = h.f_n \equiv h.\{ [S \equiv B_P \equiv$
   **EM-R** $\equiv f_{1=N}, f_2, f_3, f_D, f_n] \equiv$ h.n $\frac{(1+\sqrt{5})\,\sigma}{2\pi r} \equiv$ h $[\frac{n.\bar{B}}{4\pi^2.\, r^4}]$ ....**(mg)**

   Equations (**m**) , (**mg**) are the *Energy-Space-constituents* in Hydrogen-System .

**c-1.. The Protons and  the Nucleus Structure** :

   From above MP $\equiv$ [(+)[$\leftrightarrow$](-)] $\equiv$ Neutral = **n** , then

a.. For 1 Proton [(+)[$\leftrightarrow$](-)]$\leftrightarrow$**(+)** $\equiv$ Neutral                         →     n = 1   p = 1

b.. For 2 Proton **(+)**$\leftrightarrow$[(-)$\leftrightarrow$(+)][(+)$\leftrightarrow$(-)]$\leftrightarrow$**(+)** $\equiv$ Neutral          →     $\begin{matrix} p & n \\ n & p \end{matrix}$

c.. For 3 Proton **(+)**$\leftrightarrow$[(-)(+)]**(+)**[(-)(+)]**(+)**[(-)(+)] $\equiv$ Neutral       → $\begin{bmatrix} 0 & 0 & 0 \\ 0 & \overleftrightarrow{2} & 0 \\ 1e & 0 & 0 \end{bmatrix}$

d.. For 4 Proton **(+)**$\leftrightarrow$[(-)(+)]**(+)**[(-)(+)]**(+)**[(-)(+)]**(+)**[(-)(+)]       → $\begin{bmatrix} 0 & 0 & 0 \\ 0 & \overleftrightarrow{2} & 0 \\ 1e & 1e & 0 \end{bmatrix}$

e.. For **k** Proton **(k1)**$\leftrightarrow$[(-)(+)]**(k2)**[(-)(+)]**(+)**[(-)(+)]**(+)**[(-)($h_k$)] → $\begin{bmatrix} ke & ke & ke \\ ke & \overleftrightarrow{k:8-18} & ke \\ ke & ke & ke \end{bmatrix}$

f..  The Inscribed to the **Tetrahedron**-Sphere consists the Nucleus $\equiv$ The $\oplus$ Space , and in
   Circumscribed to the Tetrahedron-Cube  Sphere consists the Orbitals  $\equiv$ The $\ominus$ Space .

**c-2.. The Annihilation of the Fundamental Particles .**
   Considering the , *Matter Antimatter* , with the classical known theory of Annihilation as
   the common Constant Energy then issue for a **Force** $\leftrightarrow$**Anti Force** , **Action** $\leftrightarrow$**Reaction**
   **Electron** = $e^- = \ominus$→ mass $\mathbf{m_e}$ = $9,11.10^{-31}$ Kg → Charge $\mathbf{C_e}$ = $1,602.10^{-19}$ eV →
                                         Cave    a  = $5,0.10^{-17}$ m

1.. **Electron - Positron** $\Rightarrow$ $e^- \rightarrow e^+ \equiv 2\gamma \neq 0$

   The Common $M_{e \to p}$ is from relation $\frac{1}{M_T} = \frac{1}{m_e} + \frac{1}{m_p} = \frac{1}{m_e} + \frac{1}{m_e} = \frac{2}{m_e} = \frac{2}{9,11.10^{-31}} = \frac{1}{4,555.10^{-31}}$

   From energy equation E = $\frac{1}{2} M_{e\to p} c^2 = \frac{1}{2}[4,555.10^{-31}].[2,998.10^8]^2 = 6,827945.10^{-15}$ J
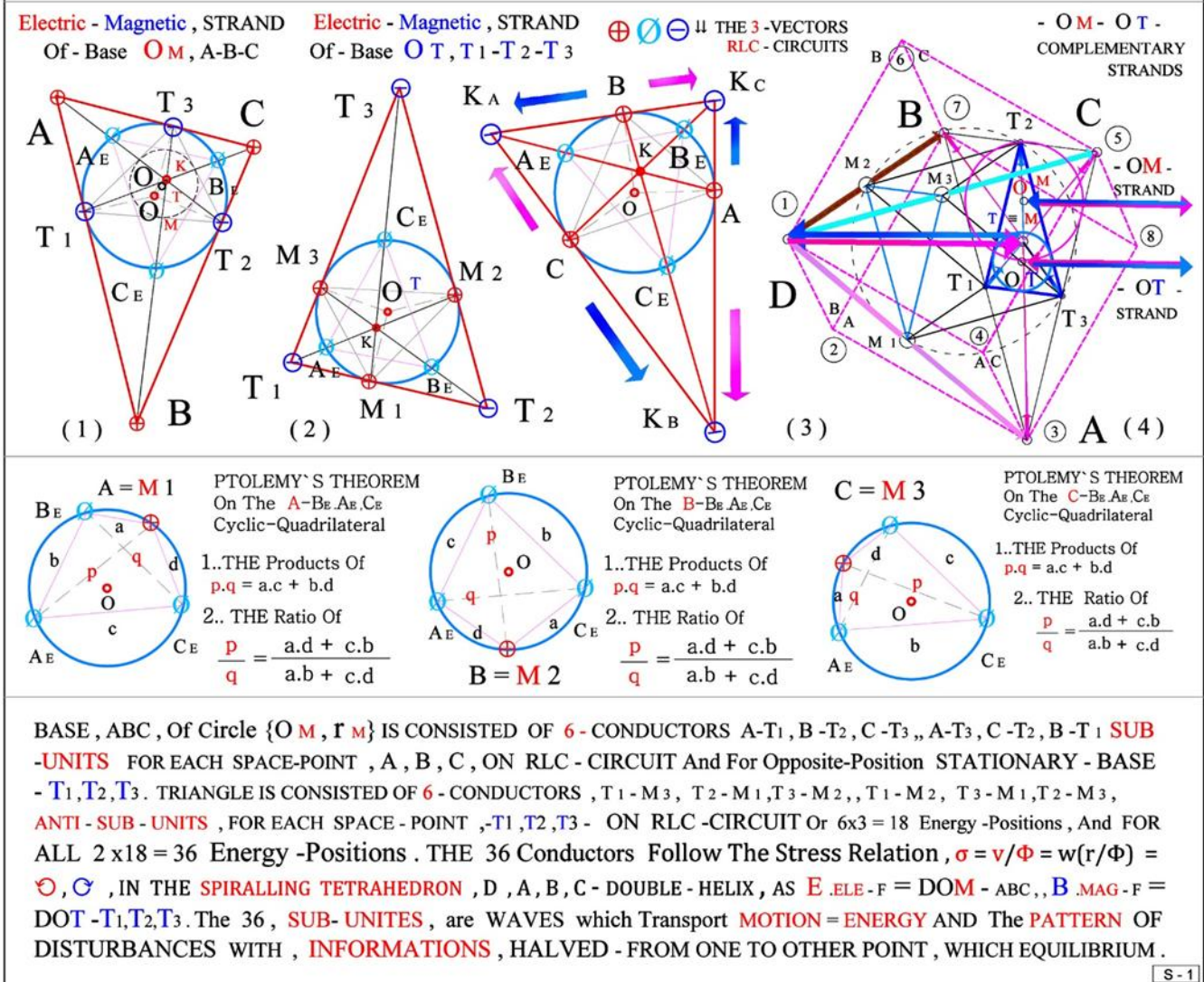       =   J / $(1,6022.10^{-19}$ eV) = $4,2616059.10^4$ eV = 42,616059 .KeV

   The common frequency is  $f_{e\to p} = \frac{E}{h} = \frac{6,827945.10^{-15} \text{ J}}{6.62607.10^{-34} \text{ Js.}} = 1,0304667.10^{19}$ H $\Rightarrow$ i.e. $\mathbf{f_\gamma}$

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

### c-3.. The Equilibrium of the Three-Spaces , The Space Anti-Space , Neutral-Space
### The Stability of Elementary Particles , Conductors and the Atoms -Nucleus : [60]



**Figure– 9a-** : **The Electric and Magnetic Field of 3 Conductors On 2 Anti-Parallel-Strands**

The Waves - Motion ≡ Energy , is Transported and , The **Pattern** of Disturbances
with Informations , Propagates from the One-Edge-Point to the other Edge-Point
of Conductors , OR is on [ Sub-Units ] . **To Prove the Stability of the System** ,
The **Equations of motion become everywhere** from any **Opposite** Space ≡ ⊕ , Anti-
space ≡ ⊖ . During these motions as , **ds** . is Done a Constant-Work , **k** , or and from
their velocities $\bar{v}$ and this Work may be **Positive** or **Negative** for Equilibrium . In F-23
Cycloid Anti-cycloid motion is as , D. The Origination of Gravity **g** , Antigravity [- **g** ]

**In Fig-9a** , Conductor $D = d = AK_A$ where ⊕ constituent attacks ⊖ by a Hook`s law force
as Stress $\sigma = E\,u$ , and an Coulomb force $F_{[+ \leftrightarrow -]} = \frac{[\oplus \leftrightarrow \ominus]}{r^2} = \frac{[2\,\sigma]}{r^2}$ , creating Work ≡ motion

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

as was shown  It was shown that , **The Stability** of **Nucleus Forces** , is succeeded through *The Pascal`s* - Ceba`s  triangle launched caves **r ,** while Leptons from their *Anti - Leptons* existence in the same launched Pascal`s - caves **r .** [58] The Equilibrium of the Three-Spaces is Done on the three Cyclic-Quadrilaterals $(AB_E A_E C_E)$ , $(BC_E B_E A_E)$ , $(CA_E C_E B_E)$ , of the  6 Conductors each for ,  [a , b , c , d , p , q ] x [3-ABC] = 18 Conductors .  The Stability is
**1..Linearly**  through *the Products* of the Diagonal - connectors *as* , → → →
$[AA_E].[B_E C_E] = [AC_E].[A_E B_E]+[AB_E].[A_E C_E]$ , $[BB_E].[C_E A_E] = [BA_E].[B_E C_E]+[BC_E].[B_E A_E]$ ,
$[CC_E].[A_E B_E] = [CA_E].[B_E C_E]+[CB_E].[C_E A_E]$   and ,

**2..Rotationally** through *the Ratio* of  the Diagonals ≡ The Conductors $| \frac{AK_B}{AK_C}|x| \frac{BK_C}{BK_A} |x| \frac{CK_A}{CK_B}| = 1$
or ± **Rotational-Equilibrium as ,** $[AK_B].[CK_A].[BK_C]=[AK_C].[BK_A].[CK_B]$, of all Opposites ⇒ **Tangential-Electromotive Forces** .

**3..** From Mechanics-Physics , *all Systems Possessing Elasticity ≡ motion and Reaction to motion ,* the called mass *, are capable of  free vibration  or vibration taking Place in the Absence of External Excitation* [7] .This Principle issues for Both Closed **or** Open Systems.

**i.e.** Either for **the Nucleus** where issues *The Pascal`s* - Ceba`s  triangle  Stability , or for **the Orbitals** where issues  the *Tetrahedron-Cube -Sphere-Mould* .**A  Signal**  as the Electric and Magnetic Field  **IN  3-Conductors** Is  transformed  **On  the 2 Anti-Parallel – Strands** .

**c-4... The Natural Electromagnetic Energy-Tetrahedron and , The  3- Conductors Into The  Energy - Cube  and Spheres**  :  [102]

   **In Fig- 9c -**  The Electric - Magnetic Field of 3-Conductors which lie on the DABC occurs  **INTO the** {⊖ 8-**Anti-Space** *Cube* , $[DA_1 A D_1 , B B_1 CC_1]$}, and The Positive →
{ ⊕ 8 - **Space** *– Cube* , $[DA_1 A D_1 , B B_1 CC_1]$} , **INTO  The** {⊖ 16-**Anti-Space** [ 1 ,2 ,3 ,4 5 , 6, 7, 8 - 9 ,10 ,11, 12 , 13 ,14 , 15, 16] } *Sphere Cube on Vertices*.= Point [The Point **16** ≡ |⇉|**Z**|] consists the **Navel-String**  Gate  into the **Triangle-Circle-System**  {Z-(ΔD,ABC), Δ[T1T2 T3]} of the Stationary Bases which Results on the **2 -Anti-Parallel-Strands .**

The Dual Photon $\bar{v}$ [$\frac{\sigma \Phi}{2\pi r} + \frac{\sigma}{2\pi r}$ ] ≡ $\bar{v}$.[ $\boxed{\bar{f}_n}$ + $f_n$ ] , occupies Stresses = σ and velocities $\bar{v}$ , in

   The Tiny-caves **r** . The **Colours** in light , are the **Still-Sub-Units** in Storage →[$\bar{v}$ .$\boxed{\bar{f}_n}$ ]←
   and exist  as Frequencies of → Violet , Blue , Green , with their Complementary Colours
   Yellow , Orange , Red ←

**Every** 8-electrons are **vibrations** on **Atoms-Cube-Structure** {**A Tetrahedron in Cube in a Sphere**} whether it be **Sound** or **Light .** Above Structure is followed by all Compounds. The Molecules are Systems consisted of **The PERIFERAL ≡** *Skeleton*  $M_{16}$ and **The CENTRAL ≡** *Fittings*  $M_8$ , and  the **ACCESSORIES ≡**  $M_4$ or  $M_2$ , $M_1$ . This Property of Atoms and of the Compounds is  **The Critical - Valve of  Switching the motion**  as this happens in the Electro-magnetic  Solenoid Valves with High or low Pressure and flow  rates directly or Not .

**Remarks  :**  *Work of Elastic Deformation* .

Elastic Deformation requires (1) That every New Stress that is applied to a New infinite Element is always added to the existing one .(2) Be always Unity Work of Deformation.
             ***When a Body contains Potential Energy ,***
During any Unloading it gives off  Mechanical - Work , since the Points of application of  the GRADUALLY - withdrawn Loads are Displaced.

If the Unloading is ABRUPT , then Kinetic Energy is converted into Potential and after is Kinetic , converted back into Kinetic and so on . That is, the body Performs an Oscillating motion until the Mechanical Energy is extinguished due to a State of Equilibrium or Alters .
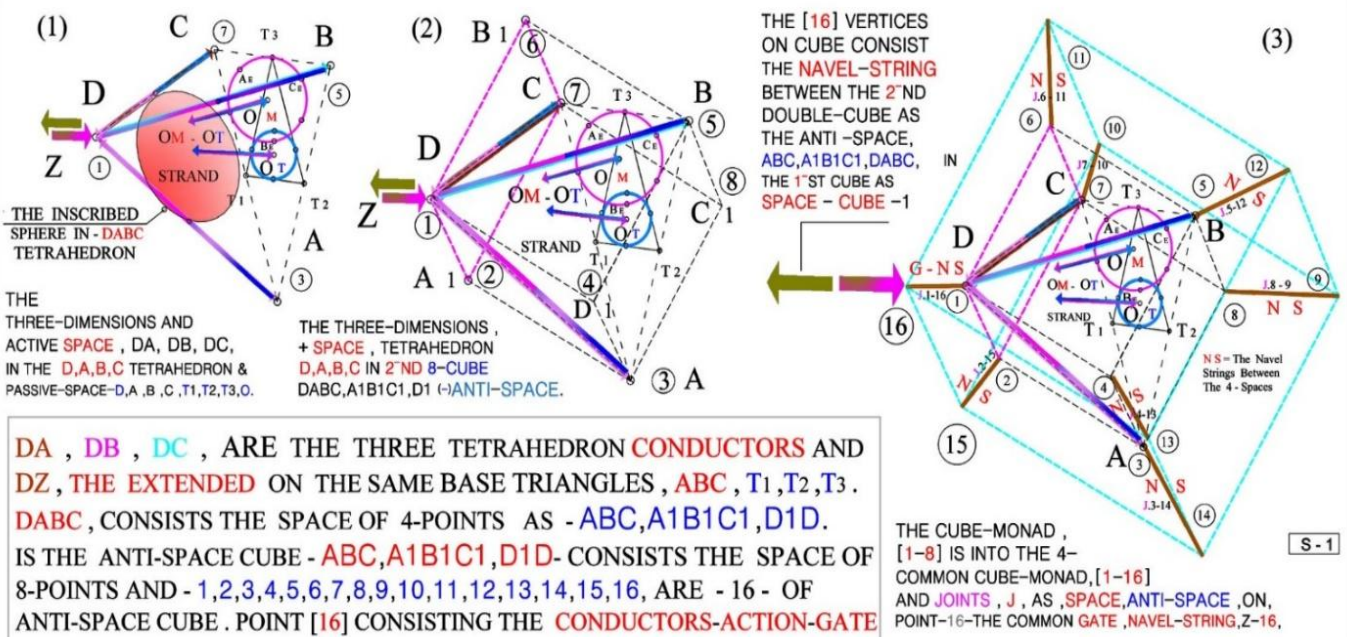


**Figure – 9b-** : The Electric - Magnetic Field of 3 - Conductors Results on **2 -Anti-Parallel - Strands** .**The Stability** of →{ ⊕ 4-**Space** [D A B C]} Regular - *Tetrahedron* , **IN** {⊖ 8-**Anti-Space** *Cube* , [ $DA_1 B D_1$ , C $C_1 AB_1$ ]}, and The →{ ⊕ 8- **Space** [ $DA_1 BD_1$ , $CC_1 AB_1$ ]} *Cube*, **INTO** The {⊖ 16-**Anti-Space** [ 1 ,2 ,3 ,4 ,5 , 6, 7, 8 - 9 ,10 ,11, 12 , 13 ,14 , 15, 16]} *Sphere Cube Vertices* . The Point [**16** ≡ | ⇒ |**Z**|] consists the **Navel - String** Gate in System . and are { Z - (ΔD , ABC) , Δ [ T1 T2 T3 ] } Stationary Bases . The Stability Analysis in [88]

**c-5.. : The Mater Antimatter 3-D Origination Mechanism** [⊕↔⊖]
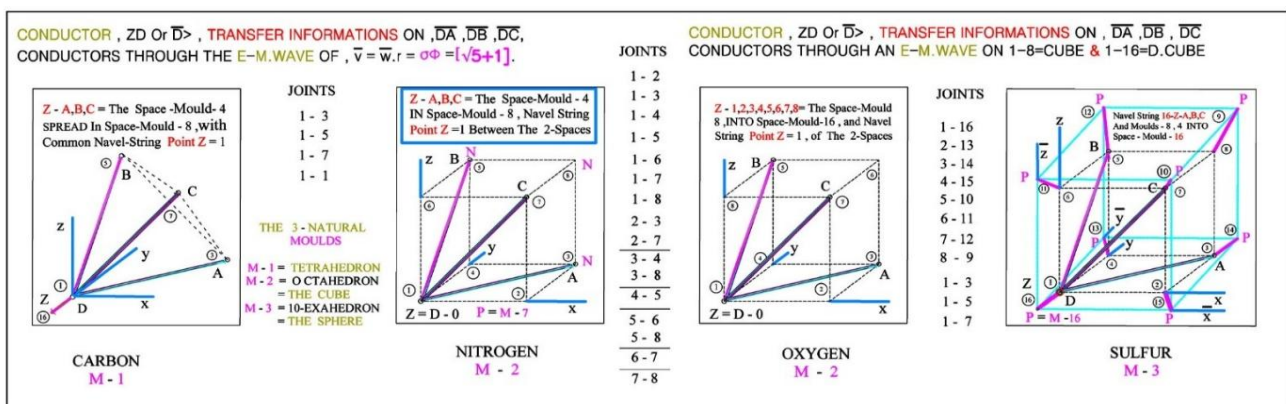


**Figure – 9c-** : The 4-Dimentional Spinning , **Tetrahedron - Cube – Spheres - Mould .**

The **Stationary-States** are → $2^{n=1-4 \, Points}$ ≡ **2 , 4 , 8 , 16** ≡ **4–Types** ←

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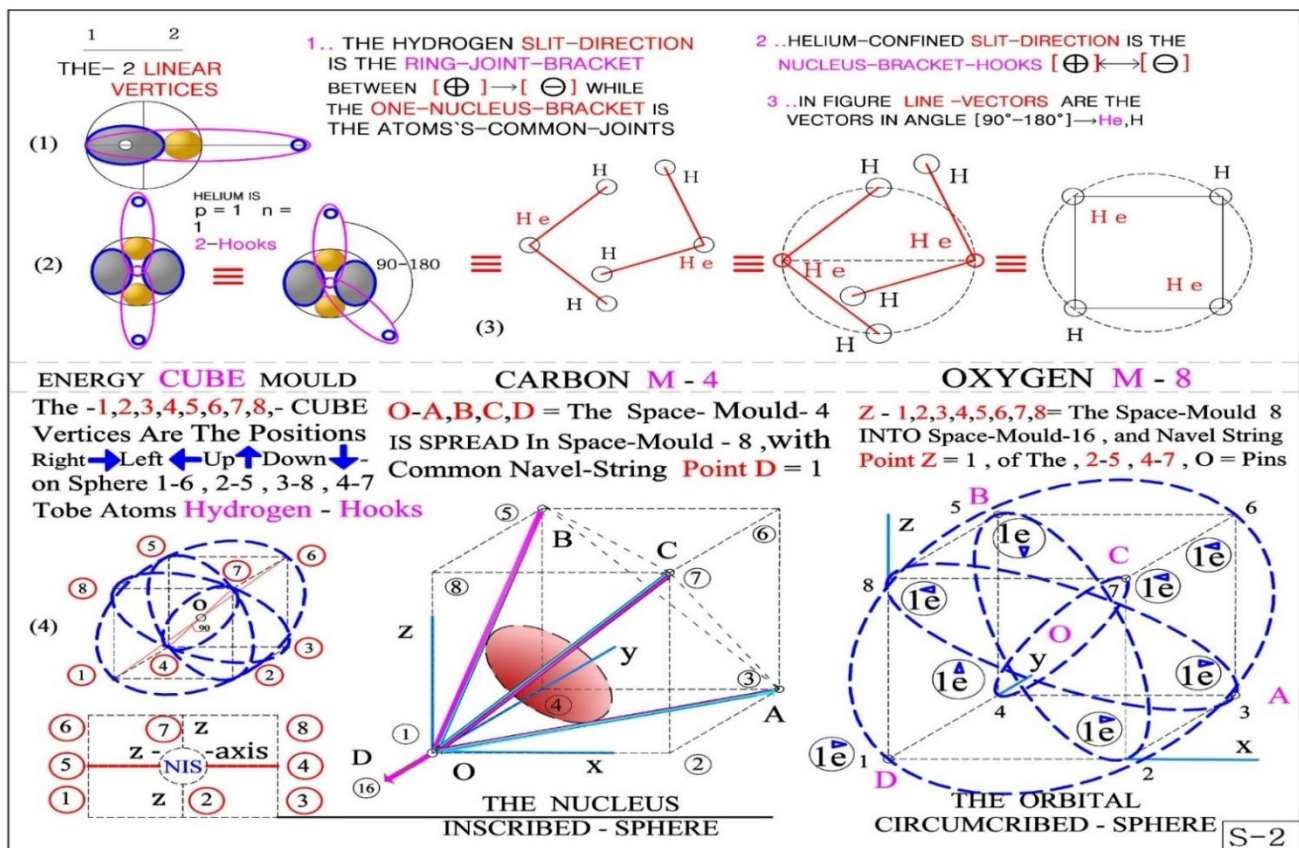
**Figure – 9d..** :The Hydrogen , Carbon , Oxygen , Atoms-Conductors **Into** the **Sphere-Cube-Mould** . Deka hexahedron , Octahedron ≡ Cube , Tetrahedron ≡ 4-Points , Triangle .

**The Nucleus** ≡ ( In-Sphere ) , **Tetrahedron** ≡ ( D - A.B.C ) **,**

**Cube** ≡ ( O,2,A,4,B,6,C,8 ) , **Orbitals** ≡ ( Ex-Sphere ) **, Mould .**

When  Vector ≡ 2-Points ≡ The Closed-Conductor , 1-Point ≡ The Opened -Conductor ≡ The Bracket-Hook . Oxygen is the Element which fills 8 - 2 = 6 vertices of Cube as EL →

$$\left\{ \begin{matrix} 1e & 0e & 1e \\ 1e & \overleftrightarrow{2} & 0e \\ 1e & 1e & 1e \end{matrix} \right\} \equiv \left( \pm \tfrac{2}{2} \right),$$ where ⓪ is the first , **Zero-Acting Cube** filled with 1e ,

therefore is the only Steady element which occupies the first Energy-Level ①

with 2 Electron-Positions as ① = 2e = $\overleftrightarrow{2}$  Positions at $\overrightarrow{1}$ , $\overleftarrow{1}$

The Electron being in the Hydrogen  Precesses because of the different axis of Rotation and Nutation`s , from the continuous and immense-communication to the effect of gravity **g** . Since Electron is continually oscillating , with the Nutation-frequency **f $_N$ ,** so  Produces a continuous and oscillating Magnetic-field –M- which in turn is the source of an oscillating Electric-field – E - which implies the **Regeneration of each other** , i.e. it is a **Propagating Electromagnetic-Wave** where E = B c , and with a quantum-Energy E = h f$_N$ or  E = 2µ.B , This Energy E consists the Hydrogen Bracket  **Hook [HBH]** , or $[\overrightarrow{BH}]$  and it is the only **free monad** which can **Bond** to all Energy Structures **.**

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

The **Spheres-Cube-Structure of Atoms** In Sphere Center –O- allows **The Stability** of the System, Per–Two electrons in Dipole Positions , $1 \leftrightarrow 6$ , $2 \leftrightarrow 5$ , $3 \leftrightarrow 8$ , $4 \leftrightarrow 7$ , consisting The-Positive Dipole-$[\overrightarrow{BH}]$ , to be able to move → Into-In- Outside it ← and allow the Atoms-Bonding as this in Energy levels . *The Cube-Structure of Atoms and Orbits in the Out-Sphere* formulates $+[\overrightarrow{BH}]$ to those **Dipole Positions which lack of one electron** and so can **PLUG-In** the **LOOP** of the others . The Atoms with Zero Stable State are **,**

    The Hydrogen Bracket-Hook **Into the Carbon** encloses the Inscribed Sphere

    for the Nucleus , **Into the Oxygen** for the Orbitals , **Into the Sulfur** enclosed into the

    Circumscribed Sphere for the Atoms-Conductors Sustains .

    The First 4-Dimentional Spinning ,**Tetrahedron-Cube–Sphere-Mould are ,** 9c--2

**1… O**-1-3-5-7 -         → **The First Solid Tetrahedron Structure in Nature** ,

**2… O**-1-2-3-4-5-6-7-8 → **The First Cube with max. Positions e = 2.n² = 8** ,

**3… R - [ O** , B , C **]** → NUCLEUS **IS IN the First Inscribed Sphere into Tetrahedron.**

**4… R-O**-1, 2, 3, 4, 5, 6, 7, 8 → ORBITS **ARE IN Enveloped Cube-Sphere of Tetrahedron.**

Deka Hexahedron , Octahedron ≡ Cubes , Tetrahedron ≡ 4-Points , Triangle ≡ 3-Points ,Vector ≡ 2-Points ≡ The Closed-Conductor , 1-Point ≡ The Opened -Conductor ≡The Bracket-Hook .

The Hydrogen **Nucleus** is kept in the Inscribed to the *Tetrahedron-Cube-System* where exist the Protons and Neutrons , while The Electrons of Hydrogen **Orbits** are kept into the Circumscribed , to the *Tetrahedron-Cube-System* . Both Equilibrium by following the Menelaus - Ceba`s Principles . [70]

Any Two Perpendicular **Energy-Vectors** , $|\mathbf{Q} \rightrightarrows \overrightarrow{AK_A} = \leftrightarrow|$ , $|\mathbf{Q} \upuparrows \overrightarrow{AK_A} = \updownarrow|$ of this

    Propagating Energy **,** FORM The **Energy-Square** , $|\leftrightarrow|.|\updownarrow|\equiv|\mathbf{Q} \rightrightarrows|.|\mathbf{Q} \upuparrows| \equiv q_0$ **,** on

    Conductor $AK_A$ and **Then** Energy-Circular-Prism $= |AK_A| .\{\mathbf{Q} \rightrightarrows \overrightarrow{AK_A} \}.\{ \mathbf{Q} \upuparrows \overrightarrow{AK_A} \}$

    $\equiv [\overline{\mathbf{Q}} _x \overline{\mathbf{Q}} _y].|AK_A| = | \leftrightarrow |.|\updownarrow|.|AK_A|$ **, i.e.**

    **An Energy-Circular-Cone** which is a Moving Energy -Volume , and **Because** from

    Cauchy equations of Stresses are of three Dimensions , **then The Energy Stresses**

    remains Flat ONLY- WHEN the Plane-Section is a circle $[\mathbf{E_2}]$ and

    The Square becomes circle, *Anti-Quadrature*..

Because from Mechanics , the Hydrogen **Nucleus** is kept in the Inscribed to the *Tetrahedron-Cube-System* where exist the Protons and Neutrons , while The Electrons of Hydrogen **Orbits** are kept into the Circumscribed , to the *Tetrahedron–Cube-System* . Both Equilibrium by following the Menelaus-Cebas Principles .

Oxygen is the Element which fills $8 - 2 = 6$ vertices of Cube and for Neon $10 - 2 = 8$ , as

$$\mathbf{Ox} \rightarrow \left\{ \begin{matrix} 1e & 0| & 0/ \\ 1e & \overrightarrow{2}|/ & 1e \\ 1e/ & 1e| & 1e \end{matrix} \right\} \equiv \left( \begin{matrix} +2 \\ -2 \end{matrix} \right) \quad , \quad ② \equiv \mathbf{Ne} \, \overrightarrow{2}_{1x8} = \overrightarrow{2} + 8 = 10 \quad \rightarrow \left\{ \begin{matrix} 1 & 1 & 1 \\ 1 & \overrightarrow{2} & 1 \\ 1 & 1 & 1 \end{matrix} \right\},$$

The Possible Orbits of Oxygen are two as , → 1e /-- $\overrightarrow{2}$/-- / 0 ← and → 1e |-- $\overrightarrow{2}$|-- 0 | ← for all the 8-Cube Positions . ⓪ is the first , **Zero-Acting Cube** and is filled with 1e , therefore is the only Steady element which occupies the first Energy-Level ① with 2 Electron-Positions as ① = 2e Positions at $\overrightarrow{1}$ , $\overleftarrow{1}$ **.** In the same way ① is the first **One-Acting Cube** and is filled

41
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

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with 2e, and so on , The Electron being in the Hydrogen -cave Precesses because of the different axis of Rotation and Nutation`s , from the continuous and immense-communication to the gravity **g** . Since Electron is continually oscillating with the Nutation-frequency $f_N$ so Produces a continuous and oscillating Magnetic-field –**M**- which in turn is the source of an oscillating Electric-field – **E** - which implies the **Regeneration of each other** , **i.e.** it is a **Propagating Electromagnetic-Wave** where **E = B c** and with a quantum-Energy $E = h\, f_N$ or $E = 2\mu.B$ , This Energy **E** consists the Hydrogen Bracket **Hook HBH** , or $[\overrightarrow{BH}]$ and it is the only **free monad** which can **Bond** to all Energy Structures .

The **Sphere-Cube-Tetrahedron Structure of Atoms** In Sphere Center –O- allows to issue The **Ceba`s Theorem for 6-Stresses** on the Inscribed Tetrahedron which Secure **The Stability** for the Nucleus-System , and for the Outer Electron-System the Stability is Obtained Per–Two electrons the Dipole Positions $1 \leftrightarrow 6$ , $2 \leftrightarrow 5$ , $3 \leftrightarrow 8$ , $4 \leftrightarrow 7$ , consisting The-Positive Dipole-$[\overrightarrow{BH}]$ , to be able to move $\rightarrow$ Into-In- Outside it $\leftarrow$ and allow the Atoms-Bonding as this in Energy levels **.**

*The Cube-Structure of Atoms and Orbits in the Out-Sphere* formulates the $+[\overrightarrow{BH}]$ to those **Dipole Positions which lack of one electron** and so can **PLUG-In** the **LOOP** of the others.

Conclusion :

1… The Forces of Atom`s  NUCLEUS , are Holded from   $\rightarrow$ The Inscribed Sphere
     In the Tetrahedron  ,  which follows the Ptolemy`s and Ceba`s Vectors Structure .
2… The Forces of Atom`s  ORBITALS , are Holded from   $\rightarrow$
     The Into  the Cube , Circumscribed–Sphere  Complex Vectors Structure .
3… The Forces of Atom`s POSITIONS  , are Holded  from $\rightarrow$
     The on Cube  Inscribed  Tetrahedron Complex Vectors Structure .
4… The Stability of the {TCIC} Mechanism follows the Ptolemy`s & Ceba`s
     Complex  Vectors  Structure [62]

The **Action of the Complex–Vectors** create the Waves of Motion $\equiv$ **Energy Waves** which are closed curves and Transported . The **Pattern** of Disturbances with the Informations  Propagates from the One-Edge-Point to the other Edge-Point of Conductors , **OR**  is on the [ Sub-Units ] .

**Coulomb force** $[\oplus \rightarrow \ominus] = F_{[+ \leftrightarrow -]} = \dfrac{[\oplus \leftrightarrow \ominus]}{r^2} = \dfrac{[2\,\sigma]}{r^2} = F = \sigma\,.A = [\dfrac{2\pi r f}{\Phi}].A = w\, r.[\dfrac{A}{\Phi}] = v\,.[\dfrac{A}{\Phi}]$ ,

and **Acts** on a Surface , A , between the Sub-Units **Axially** and **Rotationally** following Ptolemy`s and  Cebas Theorem of Equilibrium **.**                    **Figure –9e-**

**Remarks :** *The Work of Elastic Deformation* On the { TCIC } *Mechanism* :

Every New Stress that is Applied to D - Element is always added to the existing

And the Unity Work of Deformation is transformed  to three Tetrahedron Sides.

*When a* **SIGNAL** *Strikes the* **TCIC – Cube`s** *Mechanism .*

The Signal is **Energy-Wave** *carrying motion* . Unloading happens on the three **Still-Spaces in** Tetrahedron - Sides  which withdrawn Loads are Displaced   On the Anti-Parallel-Strand . If the Unloading is ABRUPT, then  Kinetic Energy of 1-Strand  is converted in the 2-Strand as Potential and so on . That is , CUBES Perform an Oscillating motion until the Mechanical Energy is extinguished to their Vertices , which are the stores of Information . Anti-Parallel-Strand is the ***Body containing the Potential Energy ,*** During any Unloading on CUBES , it gives off **Mechanical-Work** , since the Points of application of  the Gradually -withdrawn Loads are Displaced . The Stability of Kinetic – Potential Energy is continues .

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .
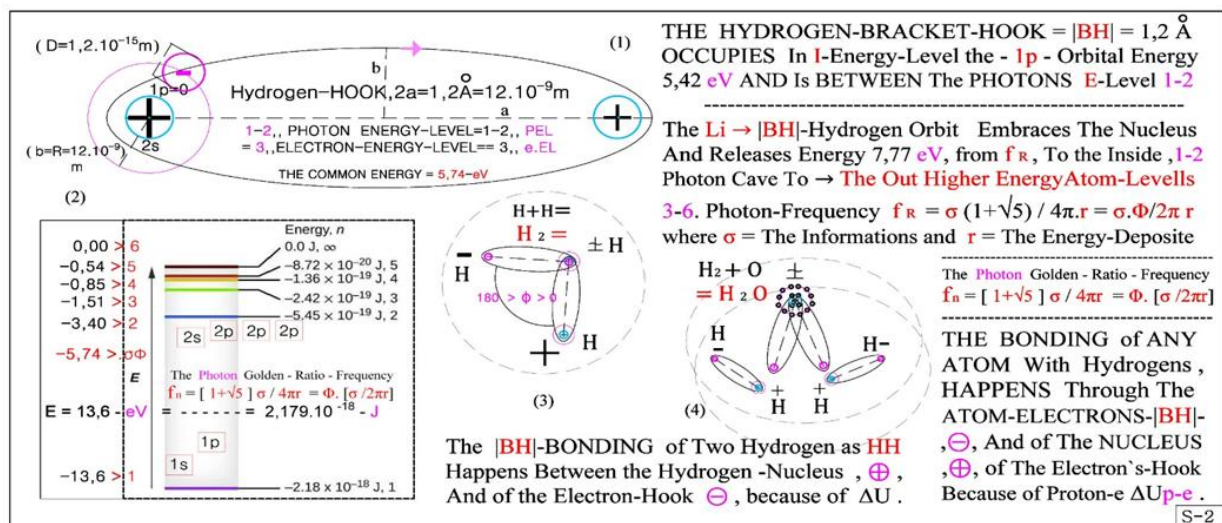
**Figure –10- The Hydrogen BRACKET – HOOK of 2 = Orbitals ⇒ [ (+) [↔] (-)]**
**Stationary-State happens as → [⊖] ≡ ORBIT-1 ↔ [⊕] ≡ ORBIT-2 ←**

## 8..[d].. The { TOBH } Mechanisms *Atoms Bonding Bracket - Hook Mechanism* .

### d-1.. : The Precession and Nutation of Electron :

**Gravitational constant G , is The Pulling and the Cohesive Force** on all the Quantized Energy
Structures which communicates with everything due to the *Periodic excitation* on all Spaces.[84]
The Newton`s laws issues for the masses and also the same to Electrons in caves as below ,

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

The Electron being in Hydrogen-cave **Precesses** because of the different axis of **Rotation**
and **Nutation`s , from the continuous and immense-communication to the gravity** , g .
Electron-Spin is the Angular-momentum-vector $\overline{B}$ and rotates according to equation $\frac{dB}{dt} = [\overline{u}\overline{B}] =$
u B.$[\overline{k}\overline{k}`]$ in Gravitational Potential $U_g = [mg].s.\cos\theta = - s\,Q.[\overline{k}\overline{k}`]$ so the change of angular
momentum $\overline{B}$ is → $\frac{dB}{dt} = u = \frac{s.Q}{B} = \frac{s.Q}{J_3.w_3}$ ← and from the 1-degree equation of motion **u** , become
**ü + w² u = 0** , with solution a **Period of Nutation** $T = \frac{2\pi}{u} = \frac{2\pi.J_3\,w}{sQ}$ , and its natural **Frequency**
$f_N = \frac{sQ}{2\pi.J_3\,w}$ ….(1) with Total Energy of Nutation $E_N = \frac{J_1}{2}[w_1{}^2 + w_2{}^2] + \frac{J_3}{2}w_3{}^2$ ….(2) [70] .
**For Material-Points** , the chains of Spins due to Periodic excitation **[↔]** is created in *Orbit a*
*Magnetic field* due to LRC-circuit and which is tuning to the critical Quantum critical-State $g_G$ .
**The Light velocity vector $\overline{v} = \overline{c}$** , by **Acting on cave** , $r = L_P$ , finds the **Impedance** $m_g$ , and
**becomes the Centrifugal-Force $F_g$ of Cave equal to Gravity g** . The **chains of Spins** for the ,
ONE-WAY Pointy vibrating , is the Resonance – Frequency $f_R = \frac{(1+\sqrt{5}\,).\sigma}{4\pi r} = \frac{\sigma\,\Phi}{2\pi r}$ of vectors
$\overline{v}$ and $\overline{B}$ , of the-Stationary-Photon-cave , where $\overline{B} \equiv \overline{S} \equiv$ Spin **, i.e.** The $f_R$ is common to both .
**The Moving Electron in Orbit** of charge $\overline{q} \equiv \ominus$ , energy E with the **Orbit -Velocity - Vector**
$\overline{v} = \sqrt{\frac{2}{m}[E - \{\frac{k}{r} + \frac{L^2}{2m\,r^2}\}]}$ which **creates IN Orbit** , **r** , the Varying and Perpendicular Magnetic

Field $\overline{\mathbf{B}}$ , which in time-turn **Creates** an Electric-field $\overline{\mathbf{E}} \perp \overline{\mathbf{B}}$ , with the Resultant force **F** acting on Electron Velocity $\overline{\mathbf{v}}$ and which is composed of the $\mathbf{V_p}$ , Perpendicular to the Magnetic-circles $\mathbf{O} \perp \mathbf{B}$ , and $\mathbf{V_v}$ , Parallel to the Magnetic-field-Vector $|\overline{\mathbf{B}}|$ , is tending in such way that $L \equiv S \equiv$ Spin . The resulting motion of Electron in trajectory is the *Helical motion* and **Work Produced** during this motion . The **Conservation of Energy exist in Orbit** between Protons and Electrons [p↔ e] therefore Energy as frequency exists in *Orbit only ,* and *differs of those of Energy- levels.*

   Since frequency $\mathbf{f_N} = \mathbf{f_R} = \mathbf{2, 839845.10^{10}}$ $s^{-1}$ and exists in all Atoms , *due to the Hydrogen first cave* ,then this $\mathbf{f_N}$ is the **Resonance - frequency $\mathbf{f_R}$** between all **Atoms and Molecules**.

   It was proved that → **Since** $f_R = \frac{\sigma\,\Phi}{2\pi r}$ and related to Hydrogen cave **r** and **Stress** $\boldsymbol{\sigma}$ only ←

   **It is the Unique Common and Neutral-Monad , in all Chemistry structures and Composites** .

**d-2..**Energy from equation **E= h.$f_N$** = $6.62607.10^{-34}$ . $2,8398447.10^{10}$ = $18,817009.10^{-24}$ J / $(1,6022. 10^{-19})$ = $1,174463 .10^{-4}$ eV , and conserved as **Thermal-Energy $E_T$** in kilo Cal and which is continually increasing as , $E_T = 18,817009. 10^{-24}$ J / $[(4,19. 10^3) = kcal]$ = $4,49093. 10^{-27}$ kcal . Since $1eV = 96,363636$ kJ/mol thermal energy $E_T = 4,49093. 10^{-27}$ kcal / [96,363636.kcal/mol=1eV] = $E_T = 4,660399.10^{-29}$ eV. This happens because of the closed Energy - Orbit-Rims **r** , constant light velocity **c** , and from **Spin** equation $S = r\,m\,c$ .

Taking into consideration the Thermal - Energy of a Photon when it is Pressing the surface of **1** m2 for 60s then , $\mathbf{E_P = 20}$ kcal = $20.(4,19. 10^3)$ = $8,3777.10^4$ J , and the ratio , $[E_T / E_P]$ = $4,49093. 10^{-27}/20 = 2,24546.10^{-28}$ , which is a Quantity **Not - detected** . The Hydrogen caves created in the Sun **1 Million Years-ago** =$10^6.365.24.3600$ =$3,1536.10^{13}$ sec ,is accumulated a Thermal-Energy of a magnitude $E_{Therm}$= $3,1536.10^{13}.4,49093.10^{-27}$ = $\mathbf{1,41626.10^{-13}}$ **kcal** , **i.e**. The Stationary Hydrogen-wave–cave needs 1- Quadrillion years to conserve 1-kcal Thermal-Energy . For Half-frequency $f_R$ / 2 =$1,4199223.10^{10}$ $s^{-1}$, the Kinetic Energy is Zero and the Potential-Energy is $\mathbf{U = E = h\,f}$ = $6,62606957.10^{-34}$ . $1,4199223.10^{10}$ = $9,4085039.10^{-24}$ J / $(1,6022.10^{-19}$ eV) = $5,8722405.10^{-6}$ eV , which agree with the **Bohr-Magneton** .

   **Remarks :**

1.. The Real Shear - Stress that exists in the Force – Carriers .

   From the Static Theory of Equivalent Tension (Moore's cycle) is (1) =

   $\sigma = \sqrt{(\sigma 1 - \sigma 2)^2 + 4\,\tau_{12}}$ , and $\sigma 1,2 = (\sigma 1+\sigma 2)/2 \pm (\tfrac{1}{2})\sqrt{(\sigma 1 - \sigma 2)^2 + 4\,\tau_{yz}^2}$ ,

   instead of the classical case which is $\sigma = 2.\tau_{max} = \sqrt{\sigma_1^2 + 4.\tau^2}$ , . (2) . Because nature always follows the uniform tension so it follows the (1) case. where exist the

   equation $\sigma = \sqrt{(\sigma 1 - \sigma 2)^2 + 4\tau_{12}}$ , and $\boldsymbol{\sigma}\,1,2 = (\sigma 1+\sigma 2)/2 \pm (\tfrac{1}{2})\sqrt{(\sigma 1 - \sigma 2)^2 + 4\tau_{yz}^2}$ =

   $\frac{\sigma}{2}[\sqrt{5}+1]$ = $\boldsymbol{\sigma}.[\frac{\sqrt{5}+1}{2}]$ , which is the *Golden ratio for stresses* .

2.. The Bernoulli Astute about Stresses-Linear-Distribution is equallyTrue for Bending too.

3.. In the case of concentrated Stresses (such as Closed or Open Conductors) ,the Doubling of the main Stresses Observation is True , *and this because of the Golden ratio Pattern.*

### 1d.. The Spaces and the Energy States :

In Articles [87-89 ] is Elucidated the Duality-Photon as Particle and as Wave .

The Photon`s Charge $\overline{\mathbf{q}}_{Photon} = \frac{v.\sigma\Phi}{2\pi r}$ , Transfers Information`s and Energy-Storage

in Nature . In Articles [87-88-89-90 ] are Elucidated The Gravitational constant **G** , The Stresses **σ** , The Light-velocity $\overline{\mathbf{c}}$ , The Gravity $\overline{\mathbf{g}}$ , The Hydrogen cave **H** , The electron **-** $\overline{\mathbf{e}}$ , The electron-charge $\overline{\mathbf{q}}_{\mathbf{e}}$ , The Weak-Forces $\overline{\mathbf{B}}_{\mathbf{F}}$ , The Strong – Forces $\mathbf{Q}_{\mathbf{T}}$ , and The Uniform-Resonance - Frequencies $\mathbf{f}_{\mathbf{R}}$ , for Atoms Structure . In Articles [91**]** is Shown **How** ,The **Three Circularly-Placed Physical-Charged-Breakages** on The-Three Spaces [⊕ - ∅ - ⊖] , **Or** on the **3-Extreme -Triangles of STPL- Mechanism** which is **The -Thrust** for The-Origination of all the Cosmic-Particles in **Linear & Rotational Conductors Frequencies** , either into the Atoms or to their Compounds [91] .

### 9a.. THE FLOW - PLAN OF THE → SPACE - ENERGY ← UNIVERSE .

**1..** It was shown in [9-18] what is **Primary-Neutral-Space** [**PNS**] as well as what is Infinity [15] , and **Rotational Energy ≡ Λ ≡ Torque ≡ momentum** [22] **so** [PNS] → [A$\mathbf{P_A}$ ↔ $\mathbf{P_B}$ B] ≡ Work W =|EP |= [ |Λ|.⦿ + Λ x⦿ ] → W = ∫ P.ds = 0 → and so exists **Time T = ds / v = 0** .

**The Cause is** , because Primary **Point** , **A** , is nothing and then **is Quantized as →**

**an Point B** (which is following the Principle of Virtual Displacements W = ∫ P.ds = 0 = Force **x** Displacement = Energy **x** Space , and according to the ancient Greek Philosopher Anaximander [ **The non-existent ( i.e. the Point A )** , **Exist when is Done , it occurs as**

**( Point B ) i.e.** ≡ [ Το μη Ον , Ον γίγνεσθαι ] = [ Το Τίποτα υπάρχει Όταν αυτό Γίνεται ] **Time is Not existing** because ds = ∞ . 0 = **constant** [21-22] . The relative Range is the Displacement **AB** → which is The **Monad-Space** as **AB = 0 → k** → The Infinity **Anti-space**.

**2..** [PNS] **The Energy-Quaternion** [ |Λ|.⦿ + Λ x⦿] ≡ $\overline{z}$ ≡ [ λ ± Λ x⦿ ] ≡ |$\overleftrightarrow{z}$o| $^{\mathbf{w}}$. e$^{\wedge}$ { [ $\overleftrightarrow{\mathbf{\Lambda}}$ ⦿i

/ √ Λ' $\overleftrightarrow{\mathbf{\Lambda}}$] . [Arc Cos (w|λ|/2 . |√$\overleftrightarrow{\mathbf{z}}$`**o**. $\overleftrightarrow{\mathbf{z}}$**o**|] } which is the Beyond-gravity Forced - field . [25] . As in case (1) → there is No change of ds → so Time T = ds / v = 0 . The Cause is the Lever arm moment of the Primary Forces and is Quantised as the Torque , < The Torque modelling of microscopic description > , and later the Momentum [19] .

The relative Range of the Infinite Points is the Displacement AB = $\overleftrightarrow{z}$ to Infinity ∞ .

**3..** [PNS] → **The Temperature-Quaternion**[ λ , ± Λ x⦿ ] = z $_0$ = Λ = n.R.T / V( λ = C) →

The Gas equation → No change of ds → so Time T = 0 . The Cause is the Heat causing

vibration on molecules and is Quantised as → Intensity ( Pressure σ = $\frac{\mathbf{2\pi r.f}}{\mathbf{\Phi}}$ = $\frac{\mathbf{2\pi r.c}}{\mathbf{\Phi.\lambda}}$ =

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

$\frac{2\pi r.\sigma}{\lambda}$) between them . The relative Range of the Infinite Points in Displacement is

AB = λ = **2πr** which is the wavelength λ.

**3.a** → k1 ≡ $z = |z_0| . e^{-i.(9.\pi/2).10}$ = **The Energy Under Planck length** , The Tank Cavity

of Gravity where $\bar{\mathbf{v}}_E = 0$ and ET = Λ.v B + Λ x v.$\bar{\mathbf{B}}$ and is the accelerating removing , Rotating energy Λ to v$\bar{\mathbf{B}}$ , m = 0 and ET = Λ.v.B + Λ x v.$\bar{\mathbf{B}}$ and it is the linearly removing , Energy Λ towards v B , so No change of ds → therefore Time T = 0 . The Cause is the High Heat Conservational Balanced Tank of gravity and is Quantised as The Fundamental Particles ( **Bosons and Fermions**) . [30]

The relative Range is of the Infinite Points in Displacement |AB| to Infinity .

**3.b** → k2 ≡ $z = |z_0|.e^{-i\left(\frac{5\pi}{2}\right)10}$ = **The Energy In Planck length** → ∞ changes of ds →

so Time T = t . Cause are the Infinite changes of Space and is Quantised as → Matter , Energy and the Existent as caves . The Material-Points occupy a relative Range in Planck`s length as In Fig-1-

**3.c.** → k3 ≡ $z = |z_0 = \Lambda|. e^{-i.(\pi/2).10}$ = **The Black Hole Temperature** , Balanced Tank Energy length , where PV = n.R.T and ( PA = Wd = σ.$T^4$ ) → No change of ds → so Time is T = Constant . Cause is the Very high Heat causing vibration on molecules and is Quantized as → Intensity = ( Pressure = Fd = C. $\bar{\mathbf{x}}$ = ± Co .w.[$\sqrt{A^2 - x^2}$] ) i.e. Cause → (Constant Co) → Quantized as New monad and relative Range is Infinity , or The meter of **Space-Energy- changes** is time T , which exists in k2 Quantized-Region only.

From Quaternion equation $\bar{\mathbf{z}}$ = [s ± $\bar{\mathbf{v}}$.⬚i] = [s² ±$\bar{\mathbf{v}}$.s²] = [ $\bar{\mathbf{A}}$↔$\bar{\mathbf{B}}$ ] = [ +|$\bar{\mathbf{s}}$|² ↔ - |$\bar{\mathbf{s}}$|² ] is seen

that motion , +|$\bar{\mathbf{s}}$|² at Point A , is transferred as motion - |$\bar{\mathbf{s}}$|² at Point B . This issues

from Quaternion equation $\bar{\mathbf{z}}$ = [s ± $\bar{\mathbf{v}}$.⬚i] = [s² ±$\bar{\mathbf{v}}$.s²] = [$\bar{\mathbf{A}}$↔$\bar{\mathbf{B}}$] = [ +|$\bar{\mathbf{s}}$|² ↔ - |$\bar{\mathbf{s}}$|² ]. Fig -1-

i.e. The **Vectors-Sum** of , **n** , Vectors , either On The Same Linear-Direction Or , On Non

Linear-Directions Results on **The – Resultant - Vector** $\overleftrightarrow{\mathbf{R}}$ of the Linear-Vibration and

between the Quaternion Edge-Poinds [ $\bar{\mathbf{A}}$↔$\bar{\mathbf{B}}$ ] .

**Conclusions –1-** : Energy In Primary-Neutral-Space [**PNS**] and , In Under Planck1s length ≡ The Tank Cavity of Gravity is an **Standing Wave** with NO-Time existing as T = ds / v = 0 .

**Conclusions –2-** : Since In Primary-Neutral-Space [**PNS**] and , In Under Planck1s length ≡ The Tank Cavity of Gravity existing as T = ds / v = 0 . the only meter of changes is the Period of Rotation of the [⊖ ↻ ⊕] as in the next Figure-11 .

46
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .
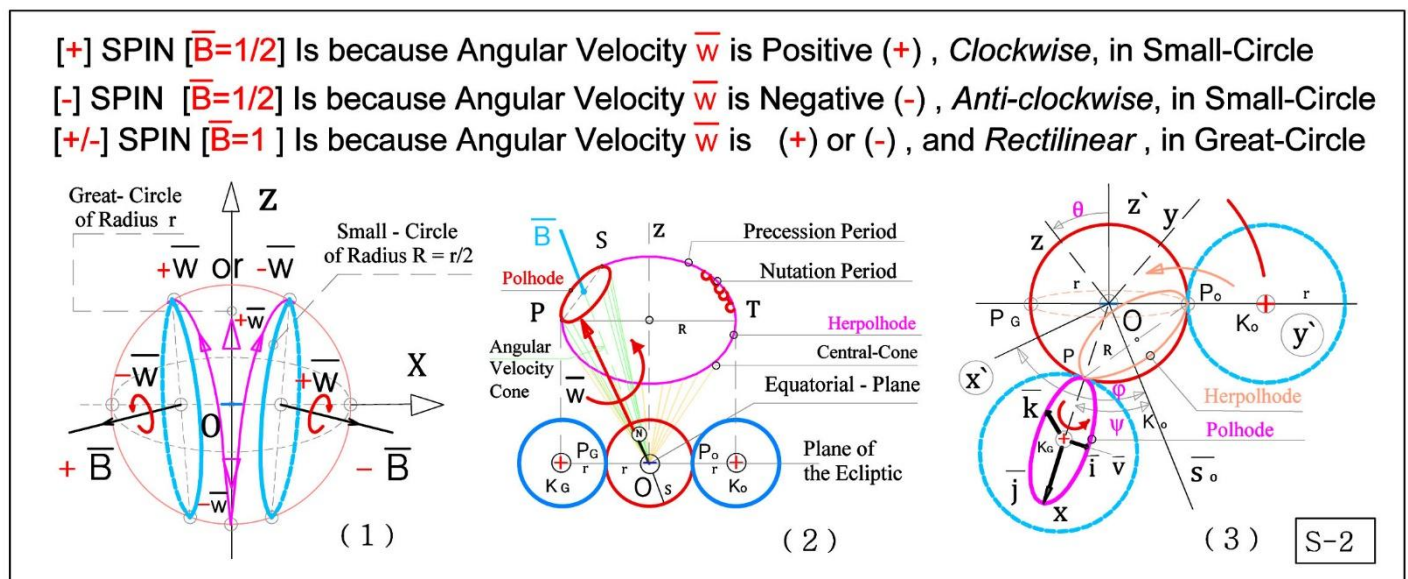
**Figure –11**-The Rotation of Opposites [⊖ ↻ ⊕] and the How and Why Spin is equal to 1 , $\frac{1}{2}$

In (**1**). The Glue-Bond-Pair of Opposites [⊖ **σ** ⊕] of the **Rectilinear motion for both →**
  **Great circles** and **the Small circles ,** *creates* on the **Stress-common-curve Rotation**
  of circle of radius r , **the** velocity $\bar{v} = w.r = \frac{2\pi}{T}.r = 2\pi r.\ f = [\frac{\sigma}{2}].(1+\sqrt{5}) = \pm\ \boldsymbol{\sigma.\Phi}$ , and the
  frequency $\mathbf{f} = \frac{(1+\sqrt{5}]).\sigma}{4\pi r} = \frac{\sigma\Phi}{2\pi r}$ , of a **Period** $\mathbf{T} = \frac{4\pi r}{\sigma(1+\sqrt{5})} = \frac{2\pi r}{\sigma.\Phi}$ and , $\pm\ \boldsymbol{\sigma}$ , where then
  exist two equal and Opposite Forces , → the Centripetal , $F_p$ , and the Centrifugal , $F_f$
  force . The Produced work as Energy is → $E = h\ f = \bar{B}$ = **Momentum** = $\mathbf{r\ m\ v} = r\ [\frac{\pi\ r^2}{2}]\ w\ r$
  $= [\frac{\pi\ r^4}{2}]w = [\frac{\pi\ r^4}{2}]\ 2\pi f = \pi^2.\ r^4.f = \bar{B}$ , where $f = \frac{(1+\sqrt{5}).\sigma}{4\pi r} = \frac{\sigma.\Phi}{2\pi r}$ , **meaning that the Stress** -
**Pointy Rotation** creates the **Angular – Momentum and momentum** as , $\bar{B}$ , $\bar{w}$ , in the
**Zero** Wave-note . [70]
The Glue-Bond Pair of Opposites [⊖ - ⊕] in the → **Left Direction of Small circles creates**
a **Rotation** on circle of radius , R , with velocity $v = w.2r = \frac{2\pi}{T}.2r = 4\pi r.\ f = [\frac{\sigma}{2}].(1+\sqrt{5})$ ,
where **frequency** $f = \frac{(1+\sqrt{5}]).\sigma}{8\pi r} = \frac{\sigma\ \Phi}{2\pi r}$ , **Period T** $= \frac{8\pi r}{\sigma(1+\sqrt{5})} = \frac{2\pi(2r)}{\sigma.\Phi}$ , where $\pm\ \boldsymbol{\sigma}$ are the two
equal and opposite Centripetal ,$F_p$ , Centrifugal ,$F_f$ force , with Energy → $E = h.f = \frac{h.\sigma\Phi}{2\pi r}$ ,
in **One** Wave- note. The Glue-Bond Pair of Opposites [⊖ - ⊕] in the → **Right Direction
of Small circles creates** a **Rotation** on circle of radius , R = 2 r , with velocity v = w.2r =
$\frac{2\pi}{T}.2r = 4\pi r\ .f = [\frac{\sigma}{2}].(1+\sqrt{5})$ , where **frequency** $f = \frac{(1+\sqrt{5}]).\sigma}{8\pi r}$ , **Period T** $= \frac{8\pi r}{\sigma(1+\sqrt{5})} = \frac{4\pi r}{\sigma.\Phi}$ and
the $\pm\ \boldsymbol{\sigma}$ are the two equal and Opposite Stresses , Or Centripetal , $F_p$, Centrifugal , $F_f$ force .
  Energy is → $E = h\ f = \frac{(1+\sqrt{5}]).\sigma h}{8\pi r} = \frac{\sigma\Phi h}{4\pi r}$ , in the **One Wave** - note .
In (**2**) The hollow-Cone of 90º , between Angular-momentum-vector $\bar{B}$ and Angular-velocity-
  vector $\bar{w}$ when illuminated by a circularly Polarized light beam , then any changes in Spin

47
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

$\equiv \overline{\mathbf{B}}$ of the Polhode Cone POT and the exchange of Linear and Angular Momentum between **Electromagnetic fields and the material Media** are shown **as the Profiles** of the Phase and the Angular-velocity-vector in the POT- **cone cross-sectional Plane** , i.e.

**The Space can be eternally** twisted but **cannot disappear** . [70]

Measurements of Physical-Properties such as Position , Momentum , Spin and Polarization , performed on Entanglement Particles gives rise to seemingly Paradoxical effects considering Systems as a whole and the ERP Paradox . The answer is given in Figure 1-(the right-2) where is shown each Property of the Material-Point **. The Spins** [⊖ ↻ ⊕] Presuppose [⊖ , ⊕] **Material-Points** which are **The caves in PNS Space** .

**Conclusions -**

**The Energy in Spins** , Presuppose that the **Caves to be in** [PNS] Space and in the Under Planck1s length . The ± **Spin is created from the** Opposite Centripetal **, $F_p$ ,** Centrifugal **, $F_f$ ,** forces . The Energy E is initially absorbed in [PNS] and in all quantized regions , either as momentum (**mv**) or as Rotational Momentum (**Λ = r. mv**) . From momentum

relation $\overline{\mathbf{B}} = m\, r\, v = m\, r^2\, w = m\, r^2\, (2\pi f) = \dfrac{J.w}{2} = [\dfrac{\pi r^4}{4}].[2\pi f] = \dfrac{\pi^2 r^4 f}{2}$ , then the Mass of the

elementary Particles is → $\mathbf{m} = \dfrac{2\pi^3 r^4. f^2}{r^2 2\pi f} = \dfrac{\pi^2 r^2}{1}\mathbf{f} = [\dfrac{\pi r.v}{2}]\mathbf{v}$ , Or $\mathbf{m}_{EP} = \dfrac{\pi.r^2}{4} = \dfrac{\pi.(1,07.10^{-7})^2}{4} =$

$8{,}992023.10^{-15}$ Kg , in the min Planck`s cave $\mathbf{d}_{Pc} = 1{,}07.\,10^{-7}$ m → which agree with the *Diffraction Energy mechanism* for all Space Levels of quantization and which are the **Energy Particles only** ,where for base **e = 2,71828** and k = 0 → $\mathbf{L}_v = \mathbf{e}^{\wedge}\mathbf{i}.(\pm \pi/2).\mathbf{b}$ the Space is $\mathbf{e}^{\wedge} (-15{,}7079) = 1{,}78118\ .10^{-7}$ m

Since velocity v = s / t = distance / time then for constant **s** , then **v** is also constant and t = T , the Period of vibration and for any constant momentum $\Lambda = \lambda_2\, m_2\, v^2_2\, / 2 = \lambda_2\, m_2\, [w\lambda_2]^2 = 4\pi^2. m_2 . \lambda^3_2 .f^2 = [4\pi^2. m_2 . \lambda^3_2]\, \mathbf{f}^2 = \mathbf{Co.}\, \mathbf{f}^2 = \Lambda$ , **i.e.**

> In all Rotational Systems time T is constant and equal to the Period of Rotation which is the meter of changes . For monads in **k2 ≡ PNS region**

$E_T = [\Lambda▯ +\Lambda\, \mathbf{x}\, ▯] = [\Lambda.M+\Lambda\mathbf{x}M\,] = \sqrt{ m.\, v^2_E\, +\, [\Lambda.\, v_B\, +\, \Lambda\, \mathbf{x}\, v_B\,]^2 } =$
$= \sqrt{ m.v^2_E\, +\, [\Lambda.\, v_B\, +\, S^2\,]^2 } = h\,.\, f = h\, /\, T\, =\, h\,.v\, /\, \lambda$ ,              **i.e.**

In every monad issues λ.mv/2 = h f = λ Λ and Kinetic-energy $\Lambda = h\, f\, /\, \lambda = C_o.f$ where the constant $\mathbf{C_o} = \mathbf{E/\, f}^2$ a gauge magnitude depended on the angular velocity $\overline{\mathbf{w}}$ , the velocity $\overline{\mathbf{v}}$ , and then wavelength λ is conserved as momentum (mv) or angular momentum ( Λ = r. m$\overline{\mathbf{v}}$ = m. wλ²/4) or both . Considering oscillatory motion as the simplest case of Energy dissipation , *and this because any other motion is not differently conserved* , then The **Work embodied in Dipole is an < Spring-mass System with viscous dumping >** with co variants , energy **E** , mass **m** , velocity $\overline{\mathbf{v}} = \overline{\mathbf{v}}_E = \dot{x}$ wavelength **λ ,** and then Energy dissipation is the damping force equal F d = C ẋ where C is a constant and ẋ the velocity.

48
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

Following the steady-state of displacement and velocity then $\rightarrow$ x = A. sin(wt - θ) $\leftarrow$ and $\dot{x}$ = w.A .cos(wt-θ) = w x , where the Energy dissipated per cycle is the executed work which is , W d = F d .dx = $\oint$ C $\bar{x}$ dx = $\oint$ C $\bar{x}$ ²dt = π C w A² = (π/4) C wλ² = [π²/2] C. f . λ² $\rightarrow$ The Energy **dissipated per Cycle Wd** by the damping Force **F $_d$** , is mapped by writing velocity $\dot{x}$ in the form $\dot{x}$ = wA.cos(wt - θ) = ±wA.$[\sqrt{1 - \sin^2(wt - \theta)}\,]$ = ± w . $[\sqrt{A^2 - x^2}\,]$ where then the Dumping force F $_d$ = C. $\dot{x}$ = ± $C_o$ .w. $[\sqrt{A^2 - x^2}]$ and

by rearranging [ cos²(wt-θ) +sin²(wt-θ) =1] then is Fd ² / [ $C_o$ .w. A ] ² + x² / A² = 1 , **i.e.**

Energy = motion is mapped as an Ellipse with **F $_d$** ,**x** mapped along the vertical and horizontal axes respectively and the Energy Dissipated Per - Cycle is given by the area enclosed by the above ellipse .

The **Total Energy E** = $\lambda_2$ . Λ which is embodied in monad $\overline{AB}$ is moving as an Ellipsoid in the Configuration of co variants **λ , m , v** = $\bar{v}_E$ , as **Kinetic** ( Energy of motion $\overline{\Omega}$ ) and **Potential Energy** (The Stored Energy in **λ , m , v**) by Rotation and Displacement , on the Principal axis (through the centre of monad ) , which is mapped out , as in Solid material configuration by the nib of the Rotational-Vector $(\overline{\Omega}) = \delta \bar{r} c) = [ \bar{v}⊡c + \bar{w} . \bar{r} n] . \delta t$ , as the Inertia-ellipsoid [ The Poinsot's - Ellipsoid of construction ] in an Absolute Frame which instantaneously Rotates around vector axis $\bar{w}$ , θ , with the constant Polar distance $\bar{w}$.Fd/|Fd| and the constant angles $\vartheta_s$ , $\vartheta_b$ , traced on Reference - Cone [Body Frame] and on [ Absolute Frame ] cone , which are rolling around the common axis of , $\bar{w}$ vector , without slipping , and if $(\overline{\Omega})$ = Fe , is the Diagonal of the Energy Cuboid with the three dimensions $\bar{a}$ , $\bar{b}$ , $\bar{c}$ then follow Pythagoras conservation law , with the three magnitudes [J,E,B ] of Energy-State following $\rightarrow$ Cuboidal , Plane , or the Linear Diagonal direction . [ 25 - 26 ].

**The Transportation of Energy** on Edge - Points happens in **Material Geometry** , while the **Transportation of** the Edge-Points as **, Positions ,** exists in **Vector Geometry** only. Since in Vibrations the **Deformation** of the **Spring is an equilibrium Position in** Δ , and the Spring-Forse k Δ = w = m g = Gravitational force **w** acting on mass **m** , then exists $\rightarrow$ **m** $\ddot{x}$ = ΣF = w = k [ Δ + x] ….(1) , and because **k** Δ = **w** we obtain w $^2_n$ = k/m.. (2) and (1) becomes $\rightarrow$ $\ddot{x}$ + **w** $^2_n$ = **0** ,…(3) $\leftarrow$ i.e. **The Transportation of Energy is a Harmonic - Vibration in cave** Δ **,** *means the Wave Pattern .*

It is shown [92] that in **PNS-Space** the two equal and Opposite Stresses **± σ ,** are the Two Centripetal , **F$_p$** , Centrifugal , **F$_f$** force where Energy is $\rightarrow$ E = h f = $\frac{(1+\sqrt{5}\,) . \sigma h}{8\pi r}$ = $\frac{\sigma \Phi h}{4\pi r}$ , in the **One Wave** - note .and the **frequency** f = $\frac{(1+\sqrt{5}\,) . \sigma}{8\pi r}$ , **Period T** = $\frac{8\pi r}{\sigma(1+\sqrt{5})}$ = $\frac{4\pi r}{\sigma.\Phi}$ .

**10.a.. The E-Spaces and the Energy Regular - Polygons .**

  **a. THE GEOMETRICAL SOLUTION :**

  **a.. The Even and Odd n-Polygons** [ 80 ] **:**

49

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .
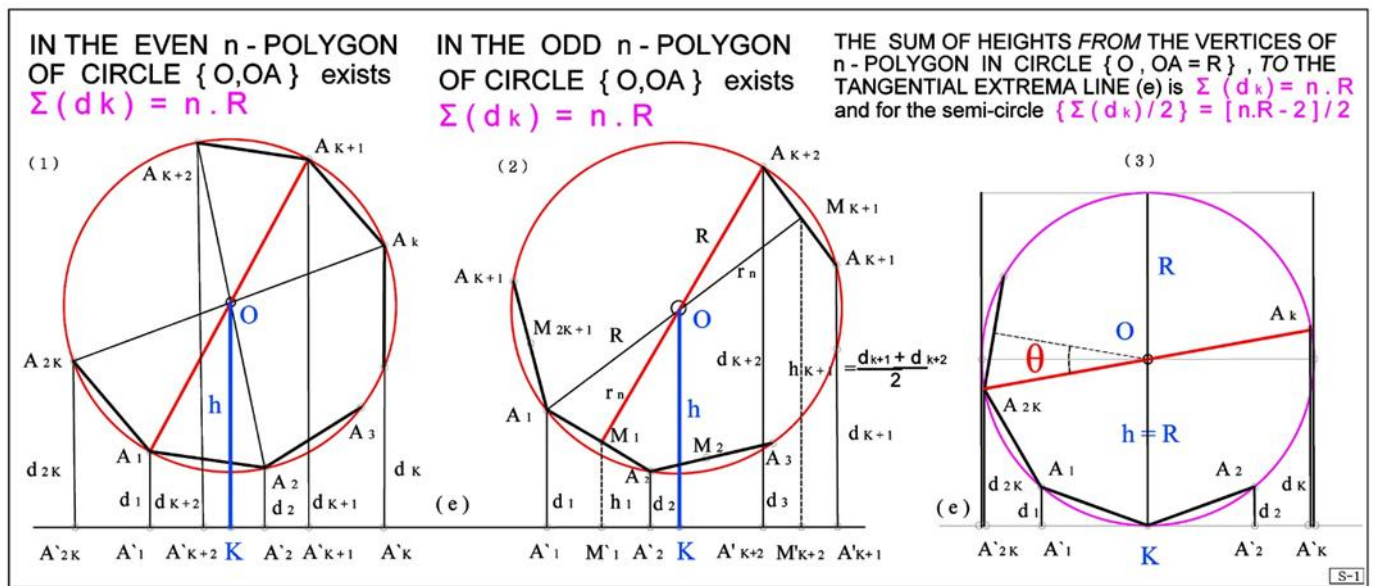
**Figure –12a- An Even** and an **Odd n-Polygon** in circle  O ,OA  with diameters , $A_k A_{2k}$ ,

Passing from  Point $A_{2k}$ , as Vertex (apex) of the Polygone , and  diameters , $A_{k+2} M_1$

To be  Perpendicular to Side  $A_1 A_2$ . *The Projections of the Heights $h_n$* .

Let be the n-Polygon    $A_1$ , $A_2$ , $A_3$ , $A_k$ , $A_{k+1}$, $A_{k+2}$, $A_{2k}$ ,  in circle  (O , $OA_1$) ,

(e)  a straight line not intersecting the circle

$d_1$ , $d_2$ , $d_{2k}$ ,     The heights of the vertices to (e) line ,

$h_1$ , $h_2$ , $h_{2k+1}$ ,  The heights of the midpoints  $M_k M_{k+1}$  of the sides to (e) line

$\varphi_{h-\lambda}$ ,                 , The Angle of the vertices and the ( $\perp$ ) Semi -Sides , and

OK = h , The height from the center  O  to  (e) line . **To Proof :**

In any n - Polygon ,   The Sum , $\Sigma = \Sigma$ (h) , of the Heights , $d_1$ , $d_2$ , $d_{2k}$ , of the Vertices

$A_1$ , $A_2$ , $A_3$ , $A_k$ , $A_{k+1}$, $A_{k+2}$, $A_{2k}$ , *where  n = 2k* , from any straight line  (e)  is equal to

$$\Sigma = \Sigma \text{ (h)} = \mathbf{n \cdot OK} = \mathbf{n \cdot h}$$   . The Geometrical Proof in [ 80]

**Remarks :**

**1..** In the System of  Regular - Polygons the , *Interior angles ( w )  and Gradient ( φ ) ,*

*Heights ( h )  and their differences ,* $\Delta h$ , – *Summation and Subtraction of  Heights*

*are  Interconnected and Intertwined  at the Common Circle  [ A ,* $\Delta h = h_A - h_B$ *]*

*Producing  the Common  ( n+1 ) , Odd – Regular - Polygon .* This Property allows

to refer  the Regular - Polygons to the Tangents of any Triangle A,B,C, as it is the

8..[a] $\Rightarrow$ **{ STPL }  Mechanisms** : **The Six Triple Points Line Mechanism** . **i.e.**

The Fundamental Particles Origination happens  from **The Electric and**

**Magnetic Field of the 3 Conductors On 2 Anti-Parallel-Strands** , Fig– 9a-

**2.. sin φ**  = ( $\frac{h_\varphi}{\lambda_\varphi}$ ) , *is the Harmonic - Mean between* [ $h_A - h_B$ ] , [ $\frac{1}{2 (r_a - r_b)}$ ]

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**The Force Harmonic Vibration & The Unbalance Vibration System :**
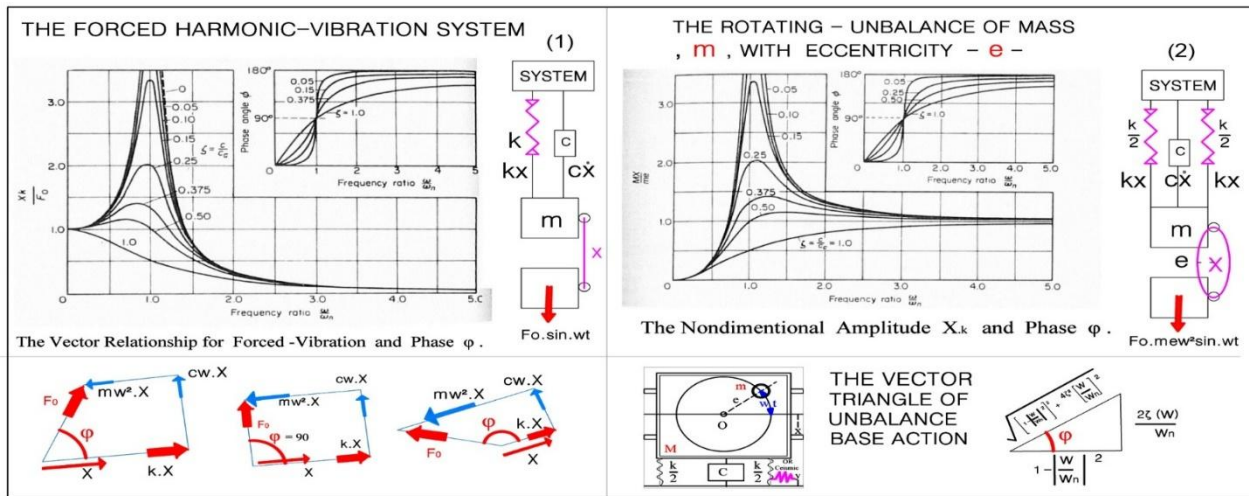


 **Figure –12b**- The Complex Frequency Response from the **Vector-Force-Polygon** is seen that the terms of the **Forced Harmonic Vibration** , ( $m\ddot{x} + c\dot{x} + kx$ ) = $\mathbf{F_0}$ .sin(w t) , are Perpendicular to the y-y axis .When the force changes to = $\mathbf{F_0}$ .cos(w t) , then the terms are Perpendicular to the  x-x axis , **i.e. Vector-Force is** $\mathbf{F_0}$ .[ cos(w t) + sin(w t) ] = $\mathbf{F_0}$ .e $^{i.[w\,t]}$

### The Rotation  Unbalance Vibration System :

For an Unbalance-Rotational System , the Source of vibration excitation IS considered an Spring mass System constrained to move  in the vertical dirtection  and is excited by an Unbalanced rotation. The Unbalance is represented by an eccentric mass **m** ,with eccentricity **e** , and Rotates with angular velocity **w** , on the Nonrotating mass  M - m , with displacement $x + |\frac{e}{\sqrt{2(n)}}|$ ,  The equation of motion is , [ M-m] $\ddot{x}$ + m$\frac{d^2}{dt^2}$ [x +$|\frac{e}{\sqrt{2(n)}}|$] + c $\dot{x}$ + kx = 0  , which can be rearranged to      → $M\ddot{x} + c\dot{x} + kx = m|\frac{e}{\sqrt{2(n)}}|$ ←   …... (c-2) .  as in Fig-12b-2.

By tuning the System to the frequency of the exciting force  $F_0$= 1 such that $w^2 = \frac{k_2}{m_2}$, then System  acts as an Vibrator-Absorber and reduces the motion of the main mass  $M \equiv m_{16} \equiv m_1$ and  $m_{8,4,2} \equiv m_2 \equiv m$ , to Zero . Making the Substitution  , $w_{11}^2 = \frac{k_1}{m_1}$ , $w_{22}^2 = \frac{k_2}{m_2}$ , and assuming the motion to be Harmonic , then the Steady-State solution is ,

$X_S = \frac{m|\frac{e}{\sqrt{2(n)}}|w^2}{\sqrt{(k-Mw^2)^2+[cw]^2}}$  , and   $\tan\varphi = \frac{cw}{k-Mw^2}$  and so the reduced  to Non-dimensional form

equation for amplitudes is , $X_S = |\frac{me}{M\sqrt{2(n)}}|.|\frac{[\frac{w}{w_n.}]^2}{\sqrt{\left(1-[\frac{w}{w_n.}]^2\right)^2+\left[2\zeta\frac{w}{w_n.}\right]^2}}|$ , and $\tan\varphi = \frac{2\zeta.[\frac{w}{w_n}]}{1-(\frac{w}{w_n})^2}$

…... (c-3)  which is  identical with    , $m\ddot{x} + c\dot{x} + kx = F_0.\sin wt$  ….. (b-4)  for Steady-State solution **.** The Resonance frequency  $\mathbf{f_1} = \frac{w1}{2\pi.} = \frac{1}{2\pi.}\sqrt{\frac{k}{m} - \frac{x^2_1}{2m^2.}}$  ,       From (c-3) ,

**a**).  Choosing the Damping factor-values  $\zeta$  and the eccentric weight exciter e , is Possible to define  the Resonant amplitude  $X = \frac{1}{2\zeta.}[\frac{me}{M}]$ , and  by altering the eccentric mass-m the Prober $X = \frac{me}{M}$ .

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**b**). Above Un balance happens in Rotating machines or wheels , which can be repaired by Adding or Detaching $\pm$ masses , or the opposite $\mp$ Detaching – Adding masses.

1). For small values of , $\frac{w}{w_n} \ll 1$ , both the Inertia $m.w^2.X$ , and Damping forces $c\,w\,X$ , are small which results in a small Phase angle $\varphi$ . The magnitude of the impressed force $F_0$ , is then nearly equal to the Spring-Force , $k\,X$ , as in Fig.12.b-2

2). For value , $\frac{w}{w_n} = 1$ , the Phase angle $\varphi = 90\,°$, as in diagram .The Inertia Force $mw^2X$ , is larger and balanced by the Spring force $k\,X$ . whereas the impressed force $F_0$ is $\gg$ the Damping force . The Amplitude at Resonance is $X = \dfrac{F_0}{c.w_n} = \dfrac{F_0}{2\zeta\,k}$ , or from diagram.

3). For large values , $\frac{w}{w_n} \gg 1$ , the Phase angle approaches $\varphi = 180\,°$ , and the impressed force $F_0$ , is expended almost in overcoming the large Inertia force , $mw^2X$ .

   **a.  THE NATURAL ANALOGOUS OF THE ENERGY MOTION THROUGH THE PATHS .**

   **The Propagation Path of Vibrations & The Vibration-Absorber .**
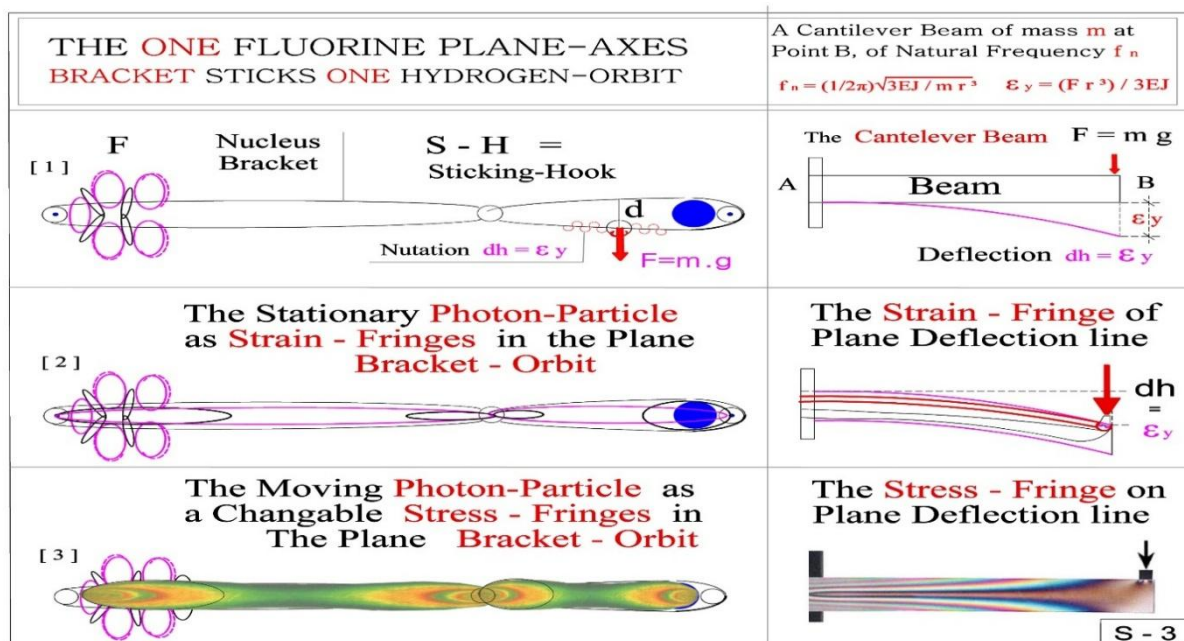


**Figure –12c-** The Electromagnetic-Wave $\{\bar{c}.\,\overline{f_n} + \bar{c}.f_n\,\}$ into the Atoms-Bracket-axes-Hook.
          The Process of the Photo elastic Fringe – Pattern [96A]

In-1- The Unloaded Beam ( $F = 0$ ) is the Length $\overline{AB}$ .

In-2- The Loaded Beam ( $F = F$ ) is the Deflection-Curve $\underset{dh}{\underbrace{AB}}$ **, the Strain ,** where exist ,

**a..** The Shape of the Beam is *the Space* , **the Strain , the Figure** of the System **,**

**b..** The Shape of the **Line-Stresses** is *the Figure-Fringe* the Path of Energy **.**

**c..** The Colure of **the Figure-Fringe .** is *the motion = the Energy* the Forced Vector.

In-3- The **Loaded and Deflected-Beam** are *the Spaces = the Figures* of System**.**
       The Loaded and Deflected-Beam **Strain-Lines-Fringes** , are the *Path of motion* ,
       The Loaded and Deflected-Beam **Colure - Fringes** , are the *kind of Forced Vector*,

52
       The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

### The Complex Force – Vector Harmonic - Vibration & The Vibration-Absorber .
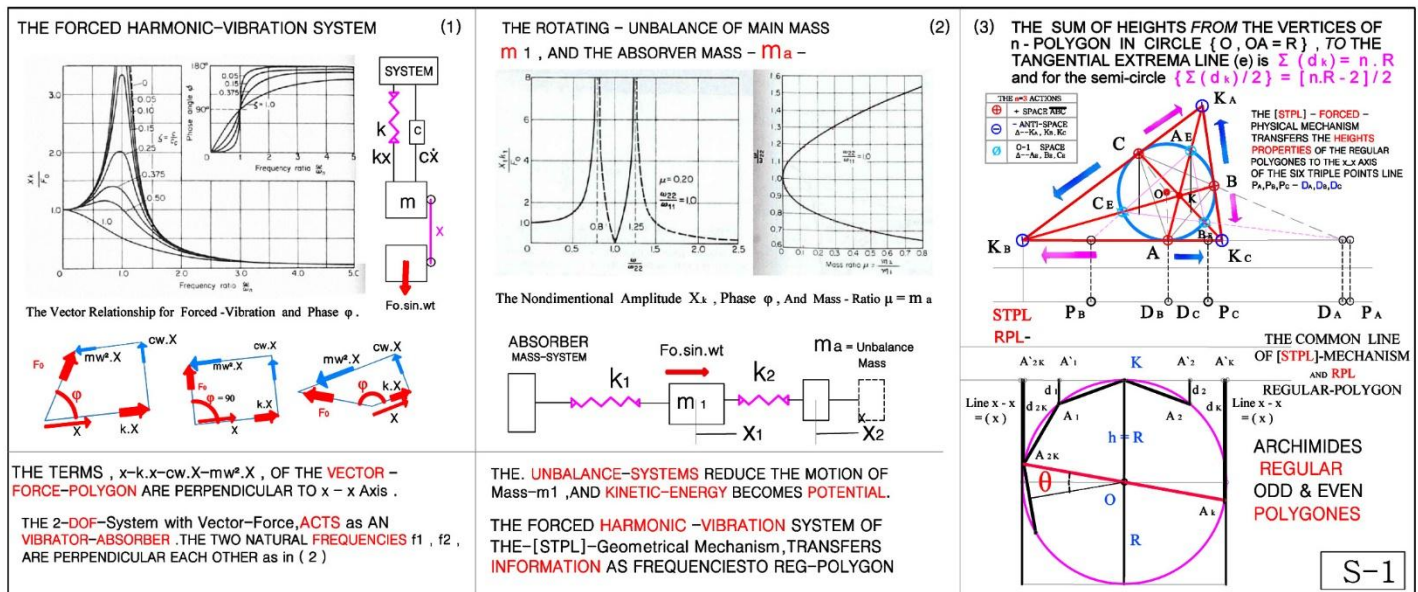


**Figure –12d**- The **Complex -Force -Vector is** $F_0 . [\cos(wt) + \sin(wt)] = F_0 . e^{i.[wt]}$ .

**In-1-** **The Terms** = $(m\ddot{x}, c\dot{x}, kx)$, of **Vector Force Polygon** are Perpendicular to y-y axis. **In Case of Complex -Force -Vector** the Polygon becomes an **Absorber** which Reduces the motion from Kinetic Energy to **Potential Energy** (a Magnetic Field) .

**In-2-** **The 2-DOF** System with **Vector Force** such that , $w_{11}^2 = \dfrac{k_1}{m_1}$, $w_{22}^2 = \dfrac{k_2}{m_2}$, **acts** as **an Vibrator Absorber**, and reduces the motion of the mass $m_1$ to zero .The two **Natural Frequencies**, $f_1$, $f_2$, are Perpendicular [$\perp$] **each other** as the Diagrams. This happens for every action on the **8.[ a , b , c , d ] Physical - Mechanisms** .

**In-3-** **The{ STPL } - Six Triple Points Line Mechanism** is formed from **Three Tangents** from A ,B ,C Spaces on 2R - Circle **.** Since **Pascal-Desargues** lines meet on Markos STPL Mechanism lines ,Then transfer the **Properties & Information** ( $f_1$ , $f_2$ , ,, $f_n$ ) From The **Complex-Vector-Absorber** = $\overline{2R}$ , to The **Vector-Force-Polygons**

**Remarks :**

1.. **The n-Knots** Figures is any N-DOF System , which **Characteristic equation** results to an Algebraic equation of 3-n Degree , with main equation of motion [ $\lambda.M + K$ ] X = 0

2.. **The n-Knots** Figures exist in Figures where the **Vector -Force - Polygons** have the same number **n** , as the in Figures . In (3) The Circularly- **Charged Breakages** are the three- **3** elements [$\Sigma = n . h$] $\Rightarrow$ [$s^2 = \oplus$ , $2s^2 = \varnothing$ , $- s^2 = \ominus$] which formulate the **3**-Knots Figures. This **{STPL}-Mechanism** of **3** elements ( n=3 ) determinates the Mould which denotes the number **n** , of the Spaces for **Elementary-Particles Vector.**

3.. **The case of {TCIC}** $\equiv$ [ $\Sigma = n . h$ ] $\Rightarrow$ 8 x ① which is **the Physical Mechanism** , gives the **n-masses** of Atom`s &Compounds determining the **Atoms Complex-Vector-Response**.

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

   **B... GENERAL :**

**1.b. The Spaces and the Energy States .**

**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 the Energy as 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 → 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 an *Confined - Stationary-wave* which is either Static or an

moving Energy-Storage or an Energy-Box [68] . The Any-Two Opposites (+) , (-) exist in

Nature and are found everywhere from → Zero-Point (0) ≡ [+ = -] or as (+ A) + (- A) = 0

in E-Geometry and → $[0] = [\oplus \leftrightarrow \ominus] \equiv f_n$ , $[\oplus \leftarrow ds \rightarrow \ominus] \equiv ds$ in Material-Geometry , to
   the aperon , $\pm \infty$ where → **The Space ≡ ds** , *is the nodes distance* , **and motion exist**
   **as the Vibration Type** ← [52]

**4..**The Electron-Nutation in Hydrogen cave Produces Energy due to **g** effect , as an minimum
   frequency $f_n \equiv 2,8398447. 10^{10}$ 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. →** **The Atoms-Plug** , Placing their Pins into the other Atoms Drains ≡ Holes ,
   and so is done that what we say the 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 New- Criterion which is **The Number of (±) Energy**
   **Conductors in Atoms** , related to their Stability .

**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 all 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 ↔ e ] = [Atom-Plug = + Electric Vector ↔ - Magnetic Vector ≡ Drain ≡ Hole ] , and
are the **Actions** between Opposite . With this New modulation [ The ,1 , 2 ,3 , 4 , Energy-
Conductors ≡ Atoms-Four Fundamental frequencies] , Conductors exist on System and **ARE**
**ACTIVE** + as → **The-Electric-Vectors** ← and simultaneously **PASSIVE** ≡ Drains (-) as →
**The-Magnetic Vectors** ≡ Holes ← **.** 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
   Energy - Space 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

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

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** in **EX-Sphere**.

**10..**In the **New-Atom-Structure** , the **Master-Keys** - **Resonances** are the Communications-

**11..** Article [110] is the completion of [72-82] and of Physical interpretation of the three
   constants of nature , that of Planck constant **L$_P$** , Newton`s  Gravitational constant
   **G** , and the Gravity Constant  **g** ,with a rigorous Geometrical and Mechanical logic **.**

It was shown [33-36]  that Un-clashed Fragments through the center , O , consist the Medium-Field Material-Fragment → [ ± s² ] = [MFMF] ≡ *The Chaos* , the Base for all motions ← and Gravity which  is a force [⬚i] while the clashed with the constant velocity , $\bar{c}$ , consist the Dark matter [ ± .$\bar{c}$.s ] and the Dark Energy [$\bar{c}$.⬚i]  *, so declaring that* → Antimatter-Galaxies and Antimatter-Asteroids can exist only as Dark-matter or and Dark-Energy and **Not** as **Antimatter light** , **- c** . From the velocity Breakages  [ ± s² = ± (w r)² ] , [ ⬚i = 2(w r)² ] and the between instress **σ** , become the Waves **{**The distance **ds** = r =|AA$_E$| which *is the Work embedded in monads and it is **what is vibrated as frequency f }** of the Material-Point with their Vibrating  equations of motion and after to become the Waves .

A → The Particles with Inherent Vibration occupying the Distances **r** = ds =Positions |AA$_E$|
   the {**Monad = OK$_0$ = R**} ≡ **Energy** In Vacuum Spaces are the Fundamental Particles ,
   as [ ± $\bar{v}$.s²] → **Fermions** , *Quarks and Leptons* , and → [ ± $\bar{v}$.⬚i] → the *Bosons* ,

B → The Gravity-Antigravity Field-Energy **g** without Vibration being a Stationary-Rotating
   Spinning Material Point M-P**.** [ ± s² ]  → The [MFMF] Neutral Field ≡ **The Energy
   Chaos** , and their *Negative Energy* Binder - Field [ ⬚i ] → as ± Positions ,

$$\text{For } \bar{r} = \pm\,\bar{r} \text{ , then } +\bar{S} = + \text{ Gravity – Spin} = +\ \frac{\pi.r^3\sigma.\Phi}{2} \ \Rightarrow \ \textbf{The Gravity Spin}$$

$$-\,\bar{S} = -\ \text{Gravity – Spin} = -\ \frac{\pi r^3\sigma.\Phi}{2} \ \Rightarrow \ \textbf{The Antigravity Spin}$$

C → The Dark-matter and the Dark-Energy constituents are as below ,
   [ ±$\bar{c}$.s² ] → The Dark-matter , and the Binder Gravity-Force  $\bar{g}$ ≡ [ ⬚i ] ,
   [ $\bar{c}$.⬚i ]  → The Expanding Dark -Energy , *Positive-Energy* , which both are
           moving with light - velocity , $\bar{c}$ , causing the Universe to Grow.
   *From above in* , **A** , *and* ,**C**, *case* → *Energy as Velocity* ,$\bar{v}$, *and* , $\bar{c}$ , *exists in the*
   *Discrete monads* ,± $\bar{v}$.s² , and  , ± $\bar{c}$.s²  only .

**2 ,  The Case of  Transportation of Energy , from Chaos to Stationary-Material-Points .**
   **Dark Energy  DE ≡ [ $\bar{c}$ .⬚i] (©) , Acting ⟹ *Positive-Energy*** , on the Five Constituents
               **{  [ (⬚i) , (+s²) , (-s²) , (+cs²) , (-cs²) ]  }** then Produces ,

   [ ± s² ]   →  The [MFMF] Field [ ± $\bar{c}$.s² ] → DM-DE  Field of , DM = **Dark matter** ,
           and  DF = Anti matter = **Dark Energy** .

   [ ±$\bar{v}$.s² ]  →  The PNS  Space , Particles  **Fermions ,** and [ ⬚i ] → G$_f$ ≡  Gravity-Force
           in  DM-DE  Stationary Rotating = Field .

   [ $\bar{v}$.⬚i ]   →  The **Bosons** ,

   [ $\bar{c}$.⬚i ]   ≡   The  **DE** →  **Dark Energy** →  The Travelling-Energy with  , **$\bar{c}$** , velocity.

   $\vec{c}$  **x** (©)  [ ⬚i ]  ≡  G$_f$   →  The Gravity Force .
                               55
          The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

In all above issue Kepler - laws , denoting that *Macrocosm and Microcosm*  Obey the Newton`s Laws of motion , in all Scales , as was Proofed .
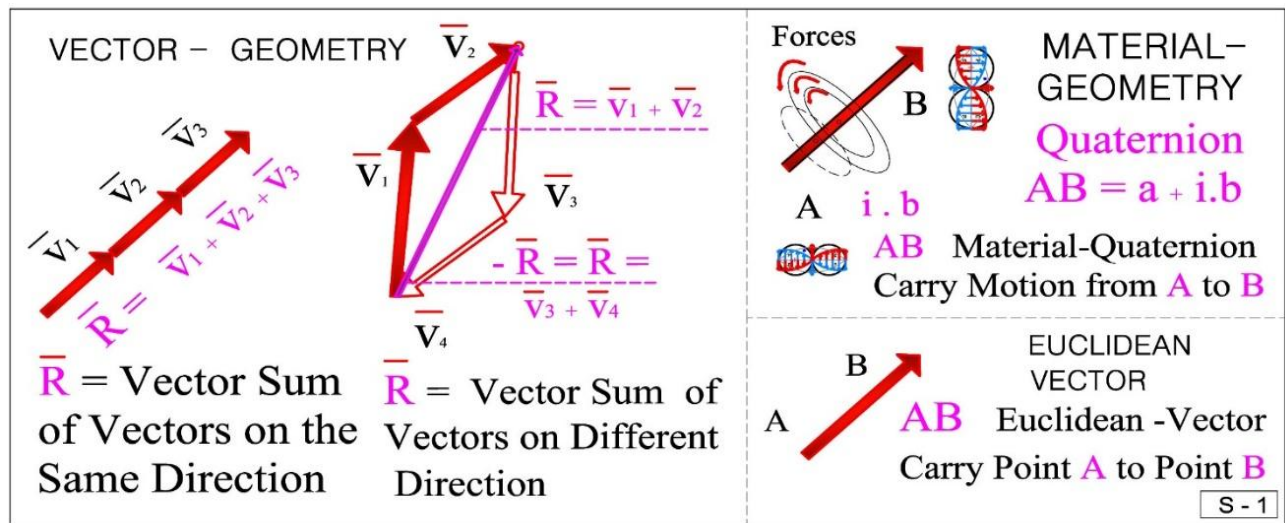


**Figure - 13 -** Vector-Geometry follows the Geometry rules as the left figure. EuclideanVector Carry Point A to  Point  B as , AB , following the Geometry rules , while The Material – Points ≡ Quaternions ,  **Carry the Motion ≡ Energy** , **from Point** A , **to the Point** , B ,

**linearly .**  In both cases the  Points are nothing Possessing Zero-magnitude and Infinite-directions . The **Two Points** in  E-Geometry consist the Straight-line-Segment Possessing |AB| - magnitude  and the |A→B| Directions while the **Two-Points** in Material-Geometry denote Two-Elements as one  (+) and  one (-)  Performing  the **Space** ≡ |AB| of **motion** = **Energy** ≡ [A ↔ B] in |AB| Space .The above  comparison can bee seen in Figure-1- also .

**Conclusions – 3 -  :**

**From above Analysis  is Seen the Path which Energy as motion follows to Propagate** .
**This Path is the Resultant of the Vector-Sum , or the Quaternion as Material–Point** .
**The Vector-Sum-length as a Geometrical-Resultant-Vector is the Quaternion`s Edge Points Energy-vibration which transfers the motion from the vibrating-Edge-Points** .

Thus  **Stress** → $\sigma = [\frac{2\pi r}{\Phi^2}] . f_n$  ← **is the Way of Information and Storage**  in Nature .

 **Extending**  above to all Planetary **Systems and to Universe** is seen that **BIG - BANG** . has Never been existed , **Inversely Energy ≡ Motion ≡ Matter** followed the (+) **Stress-Storage** ,

$\pm \sigma = [\frac{2\pi r}{\Phi^2}] . f_n$ **,** and **Anti-Matter** followed the (-) **Stress-Storage and Material-Geometry**.

**2.b. The Complex Numbers  &  Quaternion .**

**1…**  De  Moivre´s  formula for complex numbers states that  the multiplication  of  any two Complex numbers  say $z_1$ , $z_2$ ,  or $[z_1 = x_1 + i. y_1 , z_2 = x_2 + i. y_2]$ where  x = Real [z]

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

the Real-Part and y = Imaginary[z] . the Imaginary Part of , z , is the multiplication of their moduli $r_1$ , $r_2$ , where the moduli , r , is the magnitude [ r = | r | = $\sqrt{x^2 + y^2}$ ] and the addition of their angles , $\varphi_1$ , $\varphi_2$ , where $\varphi$ = arg.(z) = atan2.(y , x) and so , $z_1 * z_2$ = ( $x_1$ + i. $y_1$ ) . ( $x_2$ + i. $y_2$) = $r_1$. $r_2$ [cos($\varphi_1$+ $\varphi_2$) + i . sin($\varphi_1$+ $\varphi_2$) and when $z_1 = z_2 = z$ , and $\varphi_1 = \varphi_2 = \varphi$ , then z = x + i y and z . z = $z^2$ = $r^2$.[cos2$\varphi$+i.sin2$\varphi$) and for , w , complex numbers becomes the Euler`s , $z^w = r^w$. [ cos(w$\varphi$) + i. sin(w$\varphi$)] and so for r = 1 then → $z^w = 1^w$. [ cos $\varphi$+i. sin $\varphi$ ] $^w$ = [ cos.(w$\varphi$) + i sin.(w$\varphi$) ] . The **n**.th root of any number **z** , is a number b [ $\sqrt[n]{z}$ = b] such that $b^n$ = z and when z is a Point on the **Unit circle** r =1 , the first vertex of the Polygon where $\varphi$ = 0 is [ b = (cos$\varphi$ + i sin$\varphi$)] $^n$ = $b^n$ = z = cos(n$\varphi$) + i .sin(n$\varphi$)= [cos(360/n) + i. sin(360/n)] $^n$ = cos 360⬚ + i.sin360⬚ = 1+ 0.i = 1      **i.e.**

The **w-Spaces** which are the repetition of any Unit complex number **z** (multiplication by itself ) is equivalent to the addition of their angle and the mapping of the Regular Polygons on circles with unit sides , while the **n** Spaces which are the different roots of unit 1 and are represented by the Unit circle and have Points z = 1 as one of their vertices , are mapped as these Regular Polygons *inscribed the unit circle* , Figure-1- (1)

Since also $z^w = z^{-n}$ and $z^{-n} = z^{-1/n} = z^{+n}$ therefore complex numbers are even and odd functions , **i.e.** are Symmetrical about y , axis ( mirror ) and also about the origin . Euler`s rotation in 3D Space is represented by an axis (vector) and an angle of Rotation which is a Property of complex number and defined as $\bar{z}$ = [ s ± $\bar{v}$.i ] where s , $\bar{v}$ are real numbers and i the imaginary Part such that $i^2$ = - 1 . Extending imaginary Part to three dimensions , $v_1$ , i , $v_2$ , j , $v_3$ , k → $\bar{v}$.⬚i becomes Quaternion which has 1 + 3 = 4 degrees of freedom i.e. [ dx – dy – dz – df ] ≡ **The Space - Energy- Mode** .

2… De Moivre´s formula for the n-th roots of quaternion ,where q = k.[ cos.$\varphi$+ [⬚i].sin.$\varphi$] is for w = 1/n , $q^w = k^w$. cos.w$\varphi$ + $\varepsilon$ . sin.w$\varphi$] where , q = z = ± ( x+y.i ) decomposed into its scalar (x) and vector Part [y.i] and this because all the inscribed regular Polygons in the Unit circle have this first vertex at points , 1 , or at ,- 1 , (for real part $\varphi$ = 0 , $\varphi$ = 2$\pi$ ) and all others at imaginary Part where , k = $T_z$ = Tensor (the length) of vector , z , in Euclidean coordinates which is k = $T_z$=$\sqrt{x^2 + y^2_1 + y^2_2 + y^2_n}$ and for imaginary Unit vector $\bar{a}$ ($a_1$, $a_2$, $a_3$, $a_n$,w) the Unit vector ,$\varepsilon$, of imaginary Part is → $\varepsilon$ = (y.i / $T_y$) = [y.⬚ i ] / [$T_y$] = ± ( $y_1$ . $a_1$+ $y_2$ . $a_2$) / $\sqrt{y^2_1 + y^2_2 + y^2_n}$ , the rotation angle 0 < = $\varphi$ < 2$\pi$ , $\varphi$ = ± sin $^{-1}$ ( $T_y$ / $T_z$ ) , cos$\varphi$ = x / $T_z$ , which follow Pythagoras theorem for them and for their reciprocal quaternions $\bar{a}$` [$\bar{a}$ . $\bar{a}$ `= 1] .

Since also the directional derivative of the scalar field relation y.( $y_1$ , $y_2$ , …. $y_n$ ,,,) in the direction , i , is → i ( $y_1$ , $y_2$ …. $y_n$ ) = $i_1$. $y_1$ + $i_2$. $y_2$ + i.n.$y_n$ and is defined as → i. grad y = $i_1$.( $\frac{\partial y}{\partial 1}$ ) + $i_2$.( $\frac{\partial y}{\partial 2}$) +…= [ i.⬚].y , **which gives the change of field y , in the direction → i ,**

57
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

and [i.⬚] is the **single coherent Unit** , **Therefore coexistance between Spaces ,Antispaces** and **Sub-Spaces** of Any monad $\rightarrow$ $\vec{z}$ = x + y .i = $\overline{AB}$ , is happening through the general equation which follows

$$\mathbf{m}^{\pm[s+v\,⬚i]} = \mathbf{q^w} = \mathbf{(T_q)}\,⬚.\,[\cos.w\varphi + \varepsilon\,.\sin.w\varphi] \quad , \text{ where } ,$$

$$m = \mathbf{\lim(1 + 1/w)^w} \text{ for } w = 1 \rightarrow \infty , \; q = z = \pm\,(\,x+y.i\,)$$

$$\sin\varphi = y / \sqrt[2]{\mathbf{x^2 + y^2}} , \; \cos.\varphi = x / \sqrt[2]{\mathbf{x^2 + y^2}} , \; |z| = \sqrt[2]{\mathbf{x^2 + y^2}}$$

$$\mathbf{T_q} = \sqrt{\mathbf{x^2 + y^2_1 + y^2_2 + \cdots . y^2_n}} , \; Ty = \sqrt{\mathbf{y^2_1 + y^2_2 + \ldots . y^2_n}} ,$$

$$\varepsilon = (y.i / \mathbf{T_y}) = [y.⬚\,i\,] / [\mathbf{T_y}] = \pm\,(\,\mathbf{y_1.a_1 + y_2.a_2})/\sqrt{\mathbf{y^2_1 + y^2_2 + \cdots y^2_n}} \; \mathbf{i.e.}$$

**The Spaces** , **Antispaces** and **Sub-Spaces** of Any monad $\rightarrow$ $\vec{z}$ = x + y.i = $\overline{AB}$ follows the **Euclidean Geometry** (2a) and the **Energy** flow (2b) , as in Figure -1-3-21. The Vectors-Sum of Vectors , Either on Points on The Same - Linear-Direction of Vectors , Or on Non-Linear-Directions , Results onto The-Resultant-Vector $\overleftrightarrow{\mathbf{R}}$ , of all System-vectors and becomes *A Linear-Vibration between Quaternion-Edge-Points*.

This Remark denotes that Quaternions which are composed of Real (+charge) and of Imaginary Part (- charge) act only on the ***Resultant-Direction End-Points*** carry Energy from One - Edge to another- Edge as in Fig – 6 - The Above Property of Imaginary-Part ≡ Energy shows The How Elementary Particles are Originated from the three Charges (of The Spaces [$\oplus$ - $\varnothing$ - $\ominus$]) , Circularly-Placed on The-Three-Triangles of STPL- Mechanism . [93] From Planck`s **Energy E** = h.$f_P$ = [ 6,6262.$10^{-34}$ J.s ] x [ [ 3,28393.$10^{15}$ / s] = 2 ,176.$10^{-18}$ J , and in eV becomes $\rightarrow$ [ 2 ,176.$10^{-18}$] / [1,6.$10^{-19}$] = **13,6 eV** or , **Energy in** Gravity-Layer **g** $\Rightarrow$ **13,6 eV** = **h f** = **h / T** = **h /$\sqrt{g.a^3}$.**
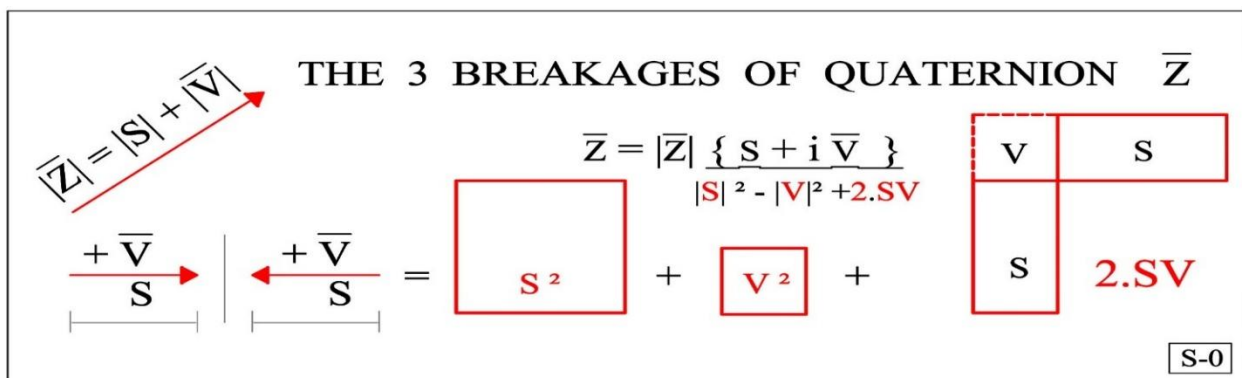


\\**Figure - 14 -** : The Action of quaternion $\bar{z}$ . $\bar{z}$ = [s + $\bar{v}$.⬚i] $^2$ ≡ s² - |$\bar{v}$| $^2$ + [2.$\overline{w}$].|s r|.⬚i ≡ ≡ s² - s² + 2.$\mathbf{s^2}$ and follows Pythagoras theorem of the Euclidean Geometry.

**3b…**: The **Stability** of Space - **Anti-Space** , IN the **Neutral-Space**

The number of Moulds of **Stationary-States** are as , $2^{n=1-4\,Points}$ ≡ 2 ,4 ,8 ,16 ≡ **4–Types** **i.e.** Monads are formed from the first **4- Moulds** as $\rightarrow$ The **1-Point** which is everywhere,

58

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

the **2- Points** which form 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 these follow the **Mould of Spaces** $2^{n=3} = 8$ Elements which is **The-Cube** as was shown before for the Atoms structure  Fig-5-28 **.**
The Atoms-Bonding follows → **Space ≡ Electric-field  & Anti-Space ≡ Magnetic-field** ←

**4b… 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 , [101]-3c.P-21.

The Problem is to determine the expression of the **Power** developed by **Gravitational Force**.

From Dual-Photon-equation , $\bar{v}.[\,\boxed{\bar{f}_n}+f_n\,] \equiv |\frac{v}{\pi^2.r^4_n}|.\boxed{\bar{B}_n}+|\bar{c}|\,f_n$ ,**when  c = 0 or $\vec{c} = \overleftarrow{c}$** , then

**Photon motion** becomes → $|\frac{v}{\pi^2.r^4_n}| . \boxed{\bar{B}_n} ← \equiv$ **Spin** . i.e. **The Stationary Photons exist as**

**their Spin only.** This **Rest-Space** is the Part $|\frac{v}{\pi^2.r^4_n}|.\boxed{\bar{B}_n}$ and its Communication Code to be

the term $|\frac{v}{\pi^2.r^4_n}|=|\frac{w\,r}{\pi^2.r^4}| = |\frac{2\,v}{2\pi^3 r^4}|$ ,**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 $\bar{c} = (\,i.\,c_x + j.\,c_y\,)$ .

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 one Force which effects on the Rest-Space** *in Torsional motion* **, and Onto the light velocity vector** $\bar{c}$**, is the gravity force** g **only**.
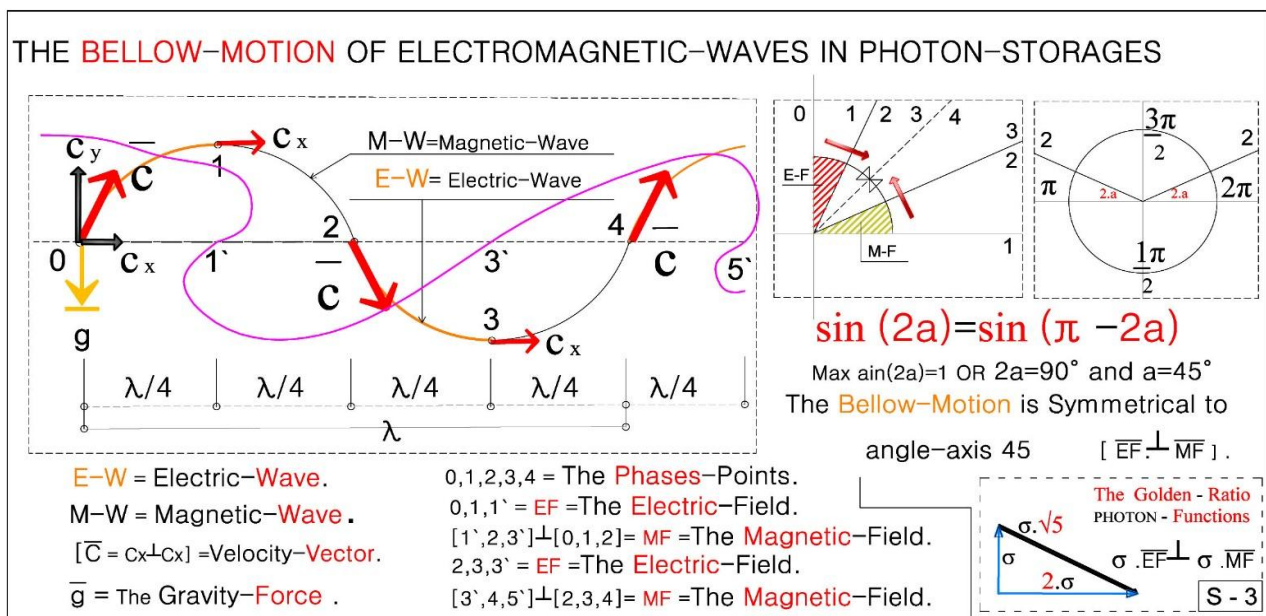


**Figure - 15-The Stability** of {⊕- **Space** [Electric Wave],{⊖-**Anti-Space** [Magnetic Wave] of **Sub-Space**  { [⊕↔⊖] ≡ ds ≡ [⊕←ds→⊖] – or –**The Neutral-Space** $[A_E, B_E, C_E]$} :

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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   $S_{max-y} = c_y{}^2 / 2g = \frac{(c \sin at)^2}{2\,g} = [\frac{c^2}{2g}]\sin^2 a$ , happening at angle   a = 90° and where $\sin^2 a = 1$ . Since at Point (1)  the velocity   $v_y = 0$ , the motion in 0 -1 , may be 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 . $\lambda$ , as  $\lambda / 4$ . distance with  $90° = \frac{\pi}{2}$  to be the change of Phase . **This means that the  Produced Work  in 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 $\lambda$ , in total Period T as  $\lambda = c_x\, T = $ c .$\cos a$ .T   or    $\lambda = c . \cos a . \frac{2\,(c \sin at)}{g} = [\frac{2\,c^2}{g}]\sin a$ , $\cos a = [\frac{c^2}{g}]\sin 2a$ ,   ……(1)

since from trigonometry exists , $\sin 2a = 2 \sin a . \cos a$  .

The maximum  wavelength $\lambda$  happens  when **$\sin 2a$** =1 or  2a = 90 ° and a = 45 °  , **i.e.**

**→The Total motion in the Wavelength , $\lambda$ , corresponds to the angle  a = 45 °, meaning that  the motion of  Space ,** *The Electric-field* **, and Anti-Space ,** *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  $\overline{c}$  to the direction of  the inner motion** or, From  90°→ 45° , the **created Work**  $W = c_y\, g$ , is Symmetrically **Stored** from  0°→ 45°.

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   .

$\lambda = c \cos a\, \frac{2\,(c \sin at)}{g} = [\frac{2\,c^2}{g}]\sin a$ , $\cos a = [\frac{c^2}{g}]\,\mathbf{\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  also

$$\mathbf{\sin 2a} = \sin(180 - 2a) = \sin(\tfrac{\pi}{2} - a)  ……(1a)$$

From Dual-Photon-equation , $\bar{v}.[\,\boxed{\bar{f}_n}+f_n\,] \equiv |\,\frac{v}{\pi^2.r^4_n}|.\boxed{\bar{B}_n}+|\,\bar{c}|\,f_n$ ,when $c = 0$ or $\vec{c} = \bar{c}$ , then

Photon motion becomes $\rightarrow |\,\frac{v}{\pi^2.r^4_n}\,|\,.\,\boxed{\bar{B}_n} \leftarrow \equiv$ Spin . i.e. The Stationary Photons exist as their

Spin only . The Rest-Space is the Part $|\,\frac{v}{\pi^2.r^4_n}|.\boxed{\bar{B}_n}$ where $v = n.\pi.c$ , and Communication

Code to be the term $|\,\frac{v}{\pi^2.r^4_n}|= |\,\frac{n.\pi c}{\pi^2.r^4_n}| = |\,\frac{n.c}{\pi.r^4}|=|\,\frac{w\,r}{\pi^2.r^4}| = |\,\frac{2\,\pi.f}{\pi^2 r^3}| = |\,\frac{2\,.f}{(\pi\,r^3)}|$ with Electromagnetic

Radiation the in monads frequency-f , which is satisfied by the relation $|\frac{2rw}{2\,v}|= \pi/2\,,\,\pi\,,\,3\pi/2$

.,,, $n.[\pi/2]$ , and $w = n.[\frac{\bar{v}}{2r}]x[\frac{\pi}{2}]$ , where $n = 1 \rightarrow \infty$ . When two Photons strike each other

$\vec{c} = \bar{c}$ , or reflect on a wall , then $c = 0$ , and from Spin $\bar{S} = \bar{B} = \pi^2. r^4. f_1$ its angular

velocity $w = n.[\frac{\bar{v}}{2r}]\,x\,[\frac{\pi}{2}] = 2\pi.f_1$ , where then its fundamental frequency $f_1 = n.[\frac{\bar{v}}{2r}]x[\frac{1}{4}] =$

$n.[\frac{\bar{v}}{8.r}]$ which for $n = [\frac{16.r^2}{v.c}]$ increases to $\frac{\lambda}{c}$ . $r^3$ and Photon-motion becomes $\rightarrow |\,\frac{v}{\pi^2.r^4_n}|$ .

$\boxed{\bar{B}_n} \leftarrow \equiv$ **Spin** , i.e. The **Stationary Photons** are **Spin only** and consist an Stationary-

**Harmonic** - **Vibration** , (1) – (1a) , with the same Period T of the two Waves [92-E}.
The effective-Range of the Wavelength $\lambda$ , 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 $\lambda_x = \frac{v^2\,y}{2\,E_y}$ and sisin$(\varphi)$ $\lambda_y =$

$= \frac{c^2.\sin^2(\varphi)}{2\,E_y}$ , where $\varphi$ = The Phase difference between the two vibrations .

Since time t , is the same between the two vibrations where then $t = \frac{v_y}{E_y} = \frac{c.\sin(\varphi).}{E_x}$ and

since the Period $= 2.t$ then $T = \frac{2c.\sin(\varphi).}{E_x}$ ...... (2) From the in x $\rightarrow$ direction velocity

$v_x = c . \cos(\varphi)$ , and displacements , $\lambda_x$ , $\lambda_y$ , become ,

$\lambda_x = v_x\,T = c.\cos(\varphi)\{\frac{2c.\sin(\varphi).}{E_x}\} = \lambda_x = \{\frac{2.c^2}{E_x}\}.\sin(\varphi).\cos(\varphi) = \{\frac{c^2}{E_x}\}.\sin(2.\varphi)$ (3)

Since in trigonometry issues , $\sin(2\varphi) = \sin(\pi - 2\varphi) = \sin(\frac{\pi}{2} - \varphi)$ and in Physics $E_x = g$ ,

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**then** $\rightarrow \lambda_x = \{ \frac{c^2}{g} \} \cdot \sin(\pi - 2\varphi)$ , $\lambda_y = \{ \frac{c^2}{g} \} \cdot \sin(\frac{\pi}{2} - \varphi) \leftarrow$   ……(4)

Since Monads are Complex quantities as $AB \equiv \bar{z} \equiv x + i. y$ , then are Quaternions where Material-Points $\equiv$ Quaternions , which **Carry the $\rightarrow$ Motion $\equiv$ Energy $\leftarrow$ from** the two Edge-Poinds [ $\bar{A} \leftrightarrow \bar{B}$ ] **, as this is from Point** A , **to Point** B circularly .

Since $\lambda_x \perp \lambda_y$ , then issues $\lambda_y = [ i = \sqrt{-1} ] * \lambda_x$ , or equivalent to multiplying the quantities along the x – x axis , by $i = \sqrt{-1}$ .

**i.e.** Photons occupy   1.. The Dual-Property of Particles and Waves ,

       2.. The Dual-Property of Stationary and Spin ,

       3.. The Dual-Property of Simultaneous existence ,

       4.. As Electric and Magnetic Fields in , $\lambda_x , \lambda_y$ ,

       5.. The Bellow motion in transverse E-M- Waves as is the way to fly ,

       6.. The Transverse E-M - Waves are $\perp$ to the Propagation-Direction ,

       7.. The Electric Effective Range is thrusted through G only. [ Fig-5 ] .

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

## C.. : THE ORIGINATION OF THE PHYSICAL LOOPS ≡ CAVES

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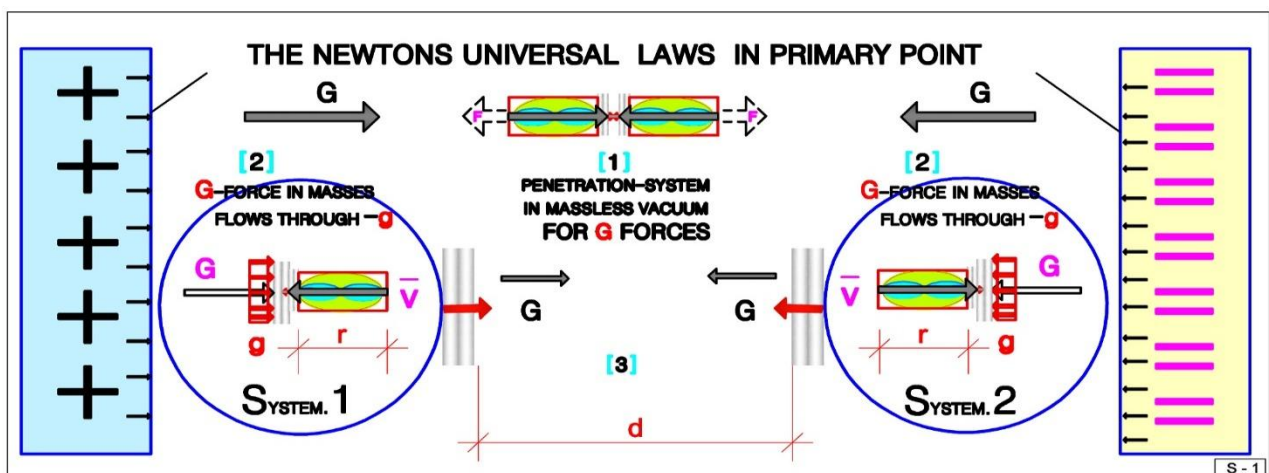


**Figure – 16.** The Newton`s Universal Laws in **Primary-Material-Point** ,

Above , is consisted of the Two-Primary-Opposite-Spaces , {+} {-} , Poles , with infinite Points and Parallel-lines such that **G** is a Uniform-Pointy–Force . 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 [(+) ,[↔], (-)] without the inner acceleration but the Material–extreme case of Periodic acceleration [→ ←] = 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 → **Primary-Opposites which Pull each other** ← therefore *the Initial Property of Attraction , G , between Primary-Opposites continue issues 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 this 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 .* The Gravity acceleration  **g** *,* produced from the in Material-Points acceleration is equal to the  Pressure **σ** , and  is the Conductor to all Waves as ,

> **Force G** - Over-Layer - A → [A ≡ mass * g ] → $G_\sigma \equiv G$ , and **Stress = g** $= \dfrac{\sigma^2\, r^2.\Phi^2}{8}$

From Figure -15(3) is seen that **Gravitational Force is Attractive** following Newton inverse square law, and it is an Attractive-force [↔] , *On any two Opposite-Elements* [ (+) , (-)] realized **through a Layer of Unit-Stresses** [σ = g ] , and becomes from an

> **HUGE Magnet in Planck`s - Loop containing the whole Universe** [89] .

> **G - Kick-Start** , *is Planck`s frequency* → $f_P = 1 / T_P = \dfrac{w}{2\pi} = \sqrt[2]{\dfrac{1}{g.a^{\,3}}}$ *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 , $1 = g .f^{\,2}_n . a^3 = [\dfrac{4\pi^2}{GM}] . f^{\,2}_n . a^3$ ,

> where  $g = [\dfrac{4\pi^2}{GM}]$   as this was shown in [79] for Unit-Monad-relation .

**An Energy-Rim = Cave** is a Plane - Surface , *an orbit* , representing  an  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 equation $1 = k.f_n{}^2.r_P{}^3$ . The **Stationary** Energy is spread in one Plane as this happens for the Stationary-waves in **Caves** , while in **Propagating** - Energy in Two , as are the **Electromagnetic Transverse waves** .  All these Energy-Rims consist the Quantized-Plane-curves as  Fig-15 . The two different motions of ⊕ Space , ⊖ 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 *, the 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 $T = \sqrt{g. a^3} = \sqrt{9{,}8076925. (2{,}1145016. 10^{-11})^3} = 3{,}04513.10^{-16}$ s , **Since** the Unit-Work = Sine Integral $= \int_0^t \dfrac{\sin t}{t} dt = 1$ , the semi-major axis , **a** , is  $a = 2{,}1145016.10^{-16}$ m , where frequency $T^{-1} = f_P = 3{,}28393..10^{15}$ /s , corresponds to a Sphere-loop in Planck`s scale as $(4/3).\pi.r^3 = 3{,}96 . 10^{-32}$ m³ ,  and then  the Energy in this Planck`s loop  is the minimum quantized . From Planck`s **Energy E** = h.$f_P$ = [ $6{,}6262.10^{-34}$ J.s ] x [ [ $3{,}28393.10^{15}$ / s] =

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

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$2,176.10^{-18}$ J , and in eV becomes $\rightarrow$ [ $2,176.10^{-18}$] / [$1,6.10^{-19}$] = **13,6 eV** or ,

**Energy in** Gravity-Layer **g** $\Rightarrow$ **13,6 eV = h f = h / T = h /$\sqrt{g.a^3}$.**

The above quantity of Energy consist the ***Hydrogen minimum Energy-Rim*** , which becomes

from Loop-equation $\mathbf{a} = \sqrt[3]{T^2/g} = \sqrt[3]{\frac{[3,04513.10^{-16}]^2}{9,80769251}} = 2,1145016.10^{-16}$ m , and it is the

Energy-cave for the Unit Energy quantity . From Newtonian Constant of Gravitation

relation issues , $G = E = h \cdot f_n = [\frac{c.r^3}{a^3}].[\,g_L\,k_L\,] = g\,.k_E = g\cdot[\,g_L\,k_L\,]$ , and since for

The **First Chemical-Neutral-*material-cave*** , **r** , constants $g_L, k_L$ are equal to unity ***i.e.***

$\mathbf{g_L = k_L = 1}$ , then above Energy of E = 13,6 eV , in Hydrogen-Plane-orbit corresponds

to the **minimum-Energy-Cave** , or $\rightarrow$ ***The Phys-Quantized-Energy-Structure*** $\leftarrow$

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 $G = g.[g_L\,k_L] \equiv g.[1*1] \equiv$

$\rightarrow g \leftarrow$ 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 $\mathbf{a} = v^2/ r \equiv \mathbf{9,8076941}$ . 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 $\lambda = c\,T = c / f_P$ which EM-Radiation , ***carries*** the Box $B_R$ .

**Universal Gravitational constant** G = g k related to g , $k_R$ , is a Force and through the

**Static g** becomes the Principal stress $\pm\,\boldsymbol{\sigma}$ , 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 ,

> $F = k_c\,[q_1.q_2 / r^2] = k_c\,[\oplus\rightarrow\leftarrow\ominus]\,/r^2 = \frac{8}{\pi r(1+\sqrt{5})}\,[\frac{B}{r^2}]$ , and Coulomb constant
>
> $k_c = 9.10^9$ Nm2/C² , **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*** $\overline{\mathbf{p}} \equiv \overline{\mathbf{B}} \equiv$ as ***momentum*** which is the analogous in the Revolving motion

where ***then issues*** $\rightarrow$ $G = g\,k = \mathbf{k_E}\,g = g.\mathbf{k_R}\,\mathbf{g_R} = \overline{\mathbf{p}}$ , $\mathbf{g_c} = \sigma = \frac{\mathbf{Force}}{\mathbf{Area}} = \frac{\mathbf{g.Mass}}{\mathbf{Area}}$

For Earth-System mass $M_E = 5,9723.10^{24}$ Kg and Radius $R_E = 6378,137$ Km

$= 6,378.10^6$ m , then Earth-constant $\mathbf{k_E} = \frac{R^2_E}{M_E} = \frac{[6,378.10^6]^2}{5,98.10^{24}} = 6,811551810^{-12}$ and

$\mathbf{G = g\,k_E} = [\,9,8076941\,].\,6,8116.10^{-12} = \mathbf{6,68056.10^{-11}}$ m³/ N.s² becoming

> from **g , $k_E$** 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** , to

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

formulate in that orbit **a** , into Planck`s cave the lightest and the less-energy mass Particle of this Universe , which is the **Hydrogen** with the minimum *Quantized-energy* of **13,6 eV**. The Centripetal acceleration in Photon cave due to Pressure **σ** ,where issues only Rotational Energy $E_R = \bar{B} . \bar{w} = 2L = J.w^2$ , and $2E = B f$ , or $\rightarrow 2.(0,5.m.c^2) = m.c^2 = 0,5.\pi.r^4.c^2/4$ , then **4. $\bar{B}$ . $f = c^2. r^4$** , where the Golden ratio frequencies $\rightarrow f_n = [\frac{n.\sigma.\Phi}{2.\pi.r}] \equiv \frac{n.(1+\sqrt{5}).\sigma}{2.\pi.r} =$

$= c^2. r^4 / 4.\bar{B} = \frac{E}{h} \leftarrow$ i.e. **The box B $_P$** , or the Planck`s Cave , carried with Light velocity **c** and Pressed into the Planck`s Loop , **as $n c^2 = n. c c$** , becomes the **Gravity g** , which is a stress by which Gravitational-force G is communicating as , $g_G = [\frac{\pi r v^4}{2}].e^3 = 9,808238$ m/s .

> Gravity is the minimum Unit-Stress-monad 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*** $\pm$ **σ** , therefore constant $g_G \cong \pm \sigma = \frac{Force}{Area} = \frac{g.Mass}{Area} = \frac{G}{k}$ , and for Unit-G constant k becomes ,
> $k = \frac{System\ Area}{System\ Mass} G$ *where* $\rightarrow \frac{1}{g} = \frac{k}{G} = \frac{System\ Area}{System\ Mass}$ and $G = k\ g_G$ , and for the Earth

$G \equiv g.k_E \equiv g .[g_L k_L] \equiv [\frac{T^2_P}{a^3}].[g_L k_L] \equiv 9,808238* 6,8116.10^{-12} \equiv 6,68056.10^{-11} \frac{m^3}{Ns^2}$

**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 $F_{grav} = \frac{G.M.m}{d^2} = \frac{g.R^2_E M.m}{Md^2} =$

$\frac{g.R^2_E .m}{d^2} = \frac{mg.R^2_E}{d^2}$ , and $G = \frac{g.R^2_E M.m.d^2}{Md^2} = \frac{g.[R^2_E]}{M} = g . k_E$ , where $k_E = \frac{[R^2_E]}{M}$ , and

> g = The minimum Quantized work as acceleration $\equiv 9, 8076941$ m/s$^2$
> $k_E$ = The Earth Local-coefficient between the two constants g , G .
> 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 $g_L = k_E / k_L$

From relation **$G = g k_E$** $= 9,8076941.6,8116.10^{-12} = $ **6,68056.10$^{-11}$** m³/ N.s²

and from relation $1 = c. r^3. f_P^2 \rightarrow f_P = \sqrt{1/cr^3}$ and from $f = E/h$ then $\frac{E}{h} = \sqrt{1/cr^3}$ or $\rightarrow$

$E = h . \sqrt{1/c.r^3}$ , $\frac{E^2}{h^2} = \frac{1}{cr^3} \rightarrow$ **and** , $E^2 = \frac{h^2}{c r^3}$ , is an Energy relation between **c , r** .

**Instances :** [77]

1.. ***For Earth-System*** mass $M_E = 5,9723.10^{24}$ Kg and for Area $\rightarrow$ Radius 6378,137 Km
= $6,378.10^6$ m then the Earth-constant $k_E = \frac{[6,378.10^6]^2}{5,9723.10^{24}} = 6,811551810^{-12}$ and
$G \equiv \sigma.\Phi^3 = g k_E = 9,8076941* 6,8115518.10^{-12} = $ **6,6805616*10$^{-11}$** m³/Kg .s²
i.e. ***Gravitational-constant* G** *becomes from* **g , k$_E$** , and issues
G = $6,6805616.10^{-11}$ m³ / N.s² ……...…(7)
***For Black-Holes-System*** mass $M_{BH} = 4,0.10^{52}$ Kg and for the Area

65
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

Radius $3,08.10^{25}$ m , then Black-Hole-constant $k_{BH} = \frac{[3,08.10^{25}]^2}{4,0.10^{52}} = 2,3716.10^{-2}$

$g_{BH} = \frac{k_E}{k_{BH}} = 6,81155.10^{-12} / 2,3716.10^{-2} = \mathbf{2,872}.10^{-10}.g_E \rightarrow$ 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 ,

$g_{BH} = \mathbf{2,872}.10^{-10}.g_E$ , an expected explanation .

For all Planes issues $\mathbf{G = k_E g = g . k_L g_L}$ , and for Black-holes also where ,

$\mathbf{G = g . k_{BH} . g_{BH}} = 9,8076941* 2,3716.10^{-2} * 2,872.10^{-10} = \mathbf{6,6805616*10^{-11}}$

***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 $\rightarrow$ $\mathbf{F_{grav}} = \frac{G.M.m}{d^2} =$

$\frac{g.R^2_E M.m}{Md^2} = \frac{g.R^2_E .m}{d^2} = \frac{mg.R^2_E}{d^2}$ , $G = \frac{g.R^2_E M.m.d^2}{Md^2} = \frac{g.[R^2_E]}{M} = g . \mathbf{k_E}$ where $\mathbf{k_E} = \frac{g.[R^2_E]}{M} = \frac{g.M}{G}$

g = The minimum Quantized Work as change of velocity $\rightarrow$ acceleration $\equiv 9,807694$ m/s²

$\mathbf{k_E}$ = The Earth Local-coefficient between the two Constants , g , G , and $\mathbf{k_E}.G = g .M$

  For Earth (E) $\rightarrow \mathbf{k_E} = \mathbf{r^2_E} / \mathbf{m_E}$ , For Bodies (B) $\rightarrow \mathbf{k_B} = \mathbf{r^2_B} / \mathbf{m_B}$ ,

  For any Body $\rightarrow$ Local Gravity $\mathbf{g_L} = \mathbf{k_E} / \mathbf{k_L}$

2.. Coulomb Electrical Force , $\mathbf{F_{electron}} = \mathbf{k_c} \frac{Q_1.Q_2}{d^2} = \frac{[\oplus\rightarrow\leftarrow\ominus]}{d^2} = \frac{8}{\pi r(1+\sqrt{5})} [\frac{B}{r^2}]$ , where

  Coulomb constant $\mathbf{k_C} = 9.\mathbf{10^9}$ Nm²/C²

3.. The Work done by the Electric field to Rotate the Dipole is $W = \mathbf{F_{electron}} . \mathbf{E_{Field}}$ .

4.. The Work done in Material Point needs a Path to exit from the Box $\mathbf{f_R} = [ \mathbf{B_{PH}} ] \equiv$

  $[ \mathbf{f_{1=N}} , \mathbf{f_2} , \mathbf{f_3} , \mathbf{f_R} = \mathbf{w^2_N} ] \equiv [E^2 + H^2]$ , 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 $\overleftrightarrow{\mathbf{AB}}$ is equal to $\rightarrow W = 2L = \overline{\mathbf{B}} . \overline{\mathbf{w}} = J.w^2 \leftarrow$

consisting the First-Energy-Store which is a Stationary Wave with , n lobes as , $\mathbf{W_{n(n+1)}} =$

$[\frac{4\pi r^2 f1}{3}].n.(n+1)$ and wavelength $\mathbf{\lambda_N} = \frac{\sigma.(1+\sqrt{5})}{4\pi r} = \frac{n.\overline{B}}{4\pi r^2} = \frac{2n.\overline{c}}{w}$ of $r = \frac{m.\overline{c}}{q.B}$ related to M-Field B

In [75-B] ,The Permeable-Resonance-Path for M-Point is $\rightarrow$ The Resonance-frequencies

$\mathbf{f_R} [S \equiv \mathbf{f_{1=n}} , \mathbf{f_2}, \mathbf{f_R} = \mathbf{w^2}]$ with $\mathbf{f_n} = [n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{n\sigma.\overline{B}}{8 r^2} ]$ related to Spin $\overline{\mathbf{B}}$ , Stress $\boldsymbol{\sigma}$ and cave r .

Since the frequency in Material-Point is $\rightarrow$

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

$$\mathbf{f_n} = \left(\frac{\mathbf{n\sigma}}{\mathbf{8\,r^2}}\right).\overline{\boldsymbol{B}} \equiv \left[\frac{1+\sqrt{5}}{2}\right]\frac{\boldsymbol{\sigma}}{\mathbf{2\pi r}} \equiv \left[\frac{\mathbf{n\sigma}}{\mathbf{8\,r^2}}\right].\overline{B} \equiv \left[\frac{1+\sqrt{5}}{2}\right]\frac{\text{Stress}}{\text{Perimeter}} \equiv \left[\frac{1+\sqrt{5}}{2}\right]\frac{\text{Force [N]}}{\text{Area}*L[m^3]} \equiv \frac{\mathbf{E}}{\mathbf{h}}, \text{ Then}$$

it occupies the Property of the Golden-ratio Pattern $\Phi$ , and equation defines that the Material Point of frequency $\mathbf{f_n}$ , 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 $\mathbf{f_n}$ , as before and from Euler`s , Rigid Body Dynamics work $\rightarrow$ W = 2L = $\overline{B}$ . $\overline{w}$ = J . $w^2 \equiv$ h. $\mathbf{f_n} \leftarrow$ i.e. The Frequency of Photon , is embodied with the $\rightarrow$ Growing-Golden-ratio-Pattern $\Phi$ 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 $\mathbf{g}$ becomes from the Stationary constant Dipole moment $\overline{\mathbf{p}} \equiv \overline{\mathbf{B}} \equiv$ momentum and which is the analogous in the Revolving motion in where then issues $\rightarrow$

**Gravitational force** $\Rightarrow$ **G = g k = $k_E$ g = g . $k_R$ $g_R$ = $\overline{p}$ . $g_c$ = $\sigma$ = $\frac{\text{Force}}{\text{Area}}$ = $\frac{\text{Mass}}{\text{Area}}$ g**

In Page-33 [77] , the Earth-constant $\mathbf{k_E} = \frac{R^2_E}{M_E} = \frac{[6,378.10^6]^2}{5,98.10^{24}} = 6,811551810^{-12}$ and the

Gravitational Force G = g $\mathbf{k_E}$ = [ 9,8076941] . $6,8116.10^{-12}$ = 6,68056.$\mathbf{10^{-11}}$ m³/N.s² 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 $\mathbf{k_E}$ =9,8076941.$6,8116.10^{-12}$= 6,68056.$\mathbf{10^{-11}}$ m³/ N.s² and

from Energy-loop relation 1= c. r³. $\mathbf{f_P^2} \rightarrow f_P=\sqrt{1/cr^3}$ , from f = E / h then f = $\frac{E}{h} = \sqrt{1/cr^3}$

or $\rightarrow$ E = h.$\sqrt{1/c.r^3}$ , and $\frac{E^2}{h^2} = \frac{1}{cr^3} \rightarrow$ 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 , [71]

**Th**e **Permissible - Permeable - Resonance - Paths** for the **means** , is as below .

1) Solids $\rightarrow$ The Normal-mode-Vibration - System { - w² [M] + [K] (X) } = 0
2) Liquids $\rightarrow$ The Cauchy Stress-Tensor as Momentum equation { $\nabla.\sigma$ = -$\nabla$p +$\nabla.\tau$ }
3) Gazes $\rightarrow$ The combined Avogadro`s Pressure - law { PV = n RT = n.mv²/3 }
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 $\overline{v}_{ij}= \overline{v}_j - \overline{v}_i = \overline{w}_{ij}.\overline{r}_{ij}$

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

8) M-Points $\rightarrow$ The Resonance-frequencies $\mathbf{f_R}$ $[S \equiv f_{1=n}, f_2, f_3, f_{R=}w^2] = \mathbf{f_n} = [\oplus \leftrightarrow \ominus]$

$= n \frac{(1+\sqrt{5})\sigma}{4\pi r} = \frac{n.\sigma.\bar{B}}{8\ r^2}$ $\rightarrow$ i.e. the Golden-ratio-Pattern , which is related to Spin.

9) Cave-Orbit$\rightarrow$ The Relation $c.L_s = L_v$ , Light-velocity $3.10^8$ m/s*$1.10^{-42}$ m
cave $=3.10^{-34}$ m²/s are the Cave-Energy-Plane-Rims in Atom`s , Planet orbits.

In Vibrations of Systems , for Orbits issues $\rightarrow W = 4\pi^2 . \frac{r^3}{T^2} . \bar{n} = 4\pi^2.r^3 . \mathbf{f}^2_{\ p} . \bar{n} \leftarrow$

which is the Energy in the Conic-Sections of Kepler`s Unit - Orbits .

The Energy-Storages $r = n.[\frac{\lambda}{2}] \equiv W_{n(n+1)} = [\frac{4\pi r^2 f1}{3}].n.(n+1)$ , are travelling through Bodies

and follow, **Lame 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 $n = 0, \pm1, \pm2, \pm3, \pm n$ , 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 $\sigma$ , and 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 $\lambda =$

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

$cT = c/f_1$, 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 $\mathbf{v = n.\pi.c}$ ....(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 $\mathbf{v}$ , an **E field is produced** , which produces the $\mathbf{\partial D/\partial t}$ field , which in turn produces the H field which produces the $\mathbf{\partial B/\partial t}$ 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** . Its Permeable - Resonance - Path is impossible in an Three-times Stronger EM-field because issues … (4)

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

For a Stationary interaction the ***Coulomb-Law-Force*** is $F_C = \frac{k[q_1 q_2]}{r^2}$ , and for Charges $\mathbf{q_1, q_2}$ where Constant $k = 9,0.10^9$ N.m²/C² , and **r ,** is the distance between the Charges.

For a Stationary interaction ***Newton Law for masses*** $m_1, m_2$ is $F_N = \frac{G[m_1 m_2]}{r^2}$ , and for $\bar{v} = \bar{r}$

Conjugating Interaction , **Energy** $E = \frac{v^2}{2}[m_1 + m_2] = \frac{r^2}{2}[\frac{F1}{g} + \frac{F2}{g}] = \frac{F.r^2}{2}[\frac{1}{g} + \frac{1}{g}] = \frac{F.r^2}{2} =$

$= \frac{F.r^2}{2}[\frac{2.g}{g^2}] = \frac{F_N.r^2}{g}$ , where $\mathbf{F_N}$ is Newton Force, and $\mathbf{E}$ 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 $\Rightarrow$ $\mathbf{k[q_1, q_2] = g.E}$ ……..(1)

Equation (1) relates any two Charges $q_1, q_2$, with Field-Energy $\mathbf{E}$ , under vector $\bar{v} = \bar{r} = \bar{c}$

**3c.. The Origination of Light velocity c :**

**Gravity** $\mathbf{g} \equiv \frac{T^2}{a^3} \equiv \frac{1}{f^2_{n.}a^3} \equiv \mathbf{9, 8076941} \rightarrow$ ***The minimum Granular Quantized Energy*** ,

The **Forces Beyond-Planck-Length are** $\rightarrow$ $F = \Phi^3. \boxed{[\oplus \, \sigma \, \ominus]} = \sigma \times \Phi^3 \leftarrow$ **(1)**-[87]

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

through **the Resonance frequency f$_R$**. It was Proved that $G = \sigma \Phi^3$, and $\sigma = \frac{G}{\Phi^3} = \frac{G.\sigma^3}{c^3}$ , or $\rightarrow$ $\mathbf{\sigma^2 G = c^3}$…**(2)** , where $\mathbf{\sigma}$ 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 $\bar{c} = w\, r = \frac{\sigma.\Phi}{r} r_p = \sigma \times \Phi = |\frac{G\, L_P}{r\, \Phi^3}|\Phi = [\frac{G.L_P}{r.\Phi^2}]$ and from Gravity relation $\mathbf{G \equiv \sigma \times \Phi^3}$ , **then issues** $\rightarrow$ $[\bar{c} = \frac{G\, L_P}{r.\Phi^2}] = [\bar{c} = \frac{2.G\, L_P}{\lambda.\Phi^2}]$ which is the **Light-velocity vector** .

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

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

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

The Base **b** , which for Natural logarithms issues << The Natural logarithm ln(x) of a Magnitude x , is the Power to which , e , would have to be raised to equal x >> and is Defining that $\rightarrow$ ln(**x**) is the Period-needed to Grow **x** , as this is in Integration $\int x$ , so $e^x$

69
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

is the **Amount of Growth** after **Period x** , and the Possible-Repetitive-Permutations for moulds and elements in which issues $\textbf{Mould}^{\textbf{Elements}} = \textbf{The - Growth-Periods}$ 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** ≡ Distances ≡ r and since $10^{-x} = \frac{1}{10^x}$ then b = $10^{-20}$ , and **The Anti-Space + Space-Positions** are , $0,707106781.10^{-20} = 1,0707106781.10^{-19}$.

> **In this Way The Non-Dimensional-number** [ $0,707106781*10^{-1} = 0,0707106781$] , **Is Quantized in cave** , r , **as distance and Becomes The-Dimensional-Space in the Decimal - System** b =10 **as cave r** , and which cave is monad **r** = 1, 0707106781 or , r = 1, 0707106781 m , having **Unit-Area** $\pi.r^2$ =3.601588 m2 , and the **QUA-Universe** is

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

From (h) , light-velocity $\bar{v} = [\frac{G\,\Phi}{A}] = \frac{6,673692.10^{-11}1,6180339887}{3,601588\,.10^{-19}\,.} = \textbf{2.99819938}.\textbf{10}^8$ **m/s**

**i.e. Gravity** Force **G** ≡ motion , **exists without mass and is Quantized** → Spread in {**Space** and **Anti-Space**} or ≡ **QUA** ≡ {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 ,

**a..** with a frequency lower than in the Undamped case and an Amplitude Decreasing with time , the **Under-Damped-Oscillator** which Originates the **Quantum** of motion which is a limiting case between the oscillatory and Non-Oscillatory motion the *Critical Damping* , and which Originates the **Light-velocity $\bar{c}$** , [49]

**b..** 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 ,

The **Three Elements** ≡ Digits of Material-Geometry are →{$\oplus$ , [$\oplus$↔$\ominus$] , $\ominus$} ≡ [+ ,0, -]← The **Permutation** , *arrangement* of the Two-Elements $P_1^2 = \textbf{2}$ , **i.e.** are→ [$\oplus,\ominus$] - [$\ominus,\oplus$]← The Three-Elements in Space need $P_1^3 = 3.(3\text{-}1).(3\text{-}2) = 6$ Positions and the same for Three-Elements in Anti-Space need $P_1^3 = 3.(3\text{-}1).(3\text{-}2) = 6$ Positions , and Total Places → $P_1^3 . P_1^3 = 6 \times 6 = 36$ Positions = A , for Spaces and Anti-Spaces as Impedance and as before for $\log_x x$ and Base x = 10 then $\log_{10} 10 = 10^{10}$ and for the two elements [$\oplus$ , $\ominus$] the Growth is $10^{[10]^2} = 10^{20}$ Positions ≡ Distances ≡ r , and since issues $10^{-x} = \frac{1}{10^x}$ then b = $36.10^{-20}$ , and $\Rightarrow \bar{v} = \frac{F\,\Phi}{A} = [\frac{G\,\Phi}{A}] = [\frac{6,673692\,.10^{-11}.1,6180339887}{36\,.10^{-20}\,.}] = 2.9795163. 10^8$ 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 equation of Gravitation G = $k_E$ g = g. [ $k_R$ $g_R$] seems that the two constants are related i.e. *act each other through Local-coefficients or through Field-lines* , called the Medium or Permissible Path which are as $\textbf{σ} = \frac{F}{A} = \frac{2\pi r f}{\Phi} = \frac{w\,r}{\Phi} = \frac{v}{\Phi}$ , 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 ,$\overline{\textbf{B}}$ , is equal to spin  **S** , b*ecause it is following the Stationary - Wave - Nodes - Principle in the Material-Points*  creating  the minimum quantized Energy which is conserved in lobes . This Property is extended also to the Number of lobes as well as to , $\pi$ , number as velocity { v = n.$\pi$.c } which is the minimum Number relating Lines and Surfaces .

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

Equation ($\pi$) shows that velocities in lobes are , **n.$\pi$**  times that of light , following , $\pi$ , number in circle **, i.e.  *In Material-Points*** exist ***velocities multi-times that of light*** and the minimum ***Surface-constant*, Unit $\pi$** , or the ***Growth of the velocity-vectors*** occurs in lobes by following the logarithm laws of Energy-constant  **c** which  acts on Space constant $\pi$. 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* $\pi$ , 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-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 , 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 Natural-World from microcosm to macrocosm .

  a) In Vacuum $\equiv$ [$10^{-62}$-$10^{-35}$m] , The {**Energy-Space-Monad $|\overline{\textbf{R}}|$** $\equiv$ |AB|},**Vanishes**.
  b) **In  Vacuum** exists only **Pointy vibrating** ( The circular motion only ) between the Opposite Dipole [$\oplus\circlearrowleft\circlearrowleft\ominus$] generating the , **w** , **B** , momentum.
  c) As **Unit-Energy Vectors $\overline{\textbf{R}}$** = $\sigma$ / $\overline{\textbf{B}}$ $\rightarrow$ exists **ON {Unit-Space-Monad |AB|** $\equiv$ **$|\overline{\textbf{R}}|\leftarrow$** And Then  $\rightarrow$ {**The Energy–Space - Monad  $|\overline{\textbf{R}}|$** $\equiv$ |AB| $\equiv$ The **Existing Universe**}
  d) STPL-Line-Machine  is the **Physical - Rotor** for the Cosmic-Particles origination .

**The Gravitational-Force G ,** Acting in the **Beyond-Planck- Cave** , and on the light Velocity **Vector $\overline{\textbf{c}}$** , creates Electron-Charge $\overline{\textbf{q}}$ Electron = $\frac{G}{c\sqrt{2}}$ = $1,574.10^{-19}$ C . which agrees with that of Coulomb`s charge  $\overline{q}$ , and the Material-Points $\overline{\textbf{q}}$ Photon= $\frac{G}{\sqrt{2}.f}$ , while by effecting on the **Whole-Planck**-Cave  $\textbf{L}_{\textbf{P}} \equiv \textbf{e}^{\textbf{ i} \cdot \textbf{(- 5\pi/2) .10}}$ , creates the Pointy-Gravity  Force as this is the **Ocean of Spins** $\overline{\textbf{g}}$ , and which Oriented-Spins , **Originate** Gravity $\overline{\textbf{g}}$ = [$\downarrow$= $\circlearrowleft$]  , and Antigravity **- g =** [$\uparrow$= $\circlearrowright$] **as Electron $\overline{\textbf{e}}$ [72] . The Light-Velocity $\overline{\textbf{c}}$  of Photons** becoming from the **Action** of G on Planck`s Length , when act on a-cave , **r = $\frac{h}{c.Z_c}$ $\neq$ $\textbf{L}_{\textbf{P}}$** then originates the **Hydrogen-cave**

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

71
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

### The Four Energy-Space Constants in Nature are , [99]

$L_P \equiv e^{-i.(\frac{\pi}{2}+2k\pi).b} \equiv e^{i.(-5\pi/2).10} \equiv e^{i.(-5\pi/2).10} \equiv \{ \sqrt{3}.\pi. \, \mathbf{1,616199}.10^{-35} \text{ m} \} \rightarrow$
    and is The Planck`s length cave ,

$g \equiv \dfrac{T^2}{a^3} \equiv \dfrac{1}{f^2_n.a^3} \equiv \mathbf{9,8076941} \rightarrow$ *The minimum Granular Quantized Energy* ,
  *from the gravity frequency* $f_g$ , representing the ***Bedding-Quantum-Raw-material***
  of force **G** , on all Energy structures .

$G \equiv \sigma.\Phi^3 \equiv g. k_E \equiv g.[g_L \, k_L] \equiv [\dfrac{T^2_P}{a^3}].[g_L \, k_L] \equiv 9,8076941 * 6,8116.10^{-12} \equiv$

  $6,68056.\mathbf{10^{-11}} \text{ m}^3/ \text{N.s}^2$   The Pulling and Cohesive Bond , of all the
  Quantized-Energy-Structures in all Spaces .

$\mathbf{f_n} \equiv \{ [S \equiv B_P \equiv EM\text{-}R \equiv f_{1=N} , f_2 , f_3, f_D ,, f_n] \equiv n \dfrac{(1+\sqrt{5})\sigma}{4\pi r} = \dfrac{n\sigma.\overline{B}}{2 \, r^2}$   and from cave

$\boldsymbol{\lambda_N} = \dfrac{4\pi.r \, c}{n\sigma.(1+\sqrt{5})} = \dfrac{\pi^2.r^4 \, c}{n.\overline{B}} ] \}$ , The Amount of Energy , the unit meter of motion ,

  in the Torsional and **Resonance-Augmented-Golden-Ratio-Pattern** $\Phi$ , and

  $\overline{v} = \overline{c} = \sigma . \Phi = \dfrac{F}{A} \Phi = [\dfrac{G \, \Phi}{A}] = [\dfrac{6,673692 .10^{-11}.1,6180339887}{36 .10^{-20} .}] = 2.9985163. \, 10^8 \text{ m} .$

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

From relation $\mathbf{G} \equiv g.k_E \equiv g.[g_L \, k_L] \equiv [\dfrac{T^2_P}{a^3}].[g_L \, k_L] = g \, k$ , 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.$\overline{r}$ , as the 1-DOF equation , $\ddot{r} + w^2 r = 0$ ,
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 $\sin w_n t$ + B $\cos w_n t$ , where A , B are constants and evaluated from
the initial velocity-conditions which become **r** = [$\acute{x}(0) / w_n$] . $\sin w_n t$ + x(0).$\cos w_n t$ .
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 ,

$\dfrac{w_n}{2\pi} = \mathbf{f_e} = \dfrac{1}{2\pi} \sqrt{\dfrac{k}{m}}$ ,  or  $4 \pi^2 f^2_e . m_e = k = \pi \, g$  and or $\rightarrow$ $\mathbf{m_e} = \dfrac{g}{4 \, \pi \, f^2_e}$

From Planck`s min-equation $f_e$ = E / h = [-13,6 x $1,6.10^{-19}$ = $2,176.10^{-16}$ Joule] /
[ $6,6262.10^{-34}$ J.s ] = **3, 283998.$10^{16}$** /s ,where in Hydrogen atom energy E = h f = -13,6 eV
Substituting all the *minimum-meters of Planck`s scale* then , *Electron mass is* ,

$\mathbf{m_e} = \dfrac{g}{4 \, \pi \, f^2_e} = \dfrac{9,808238}{4.\pi.[3,28399.10^{16}]^2}$  = **- 7 , 2373149. $10^{-30}$** kg ……… (4b)

$\mathbf{f_e} = $ **3, 283998.$10^{16}$** /s , and Loop $\mathbf{L_e} = $ **2 , 3762992.$10^{-16}$** m  …..(4c)
Relation $4\pi^2 f^2_e . m_e = k = \pi \, g$ , 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 Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**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 eV} , becoming from Material-Point In Planck`s-length , *minimum-cave*, occupying the less Unit **frequency** in **Planck`s – Length** ,**with Negative-charge { $f_e$= 3,283998.$10^{16}$ /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 $E_n - E_{n-1} = [m_e.v^2]$ .[2n-1] , where the electrons , **the Electric–Charges** , roll **.**

**Electron Charge $\overline{q}$** 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 → J s = N m s = Power** ,where from, *Energy = Power* x *Time* , issues the Beyond Planck`s length $L_P$ , and The Voltage V is → $\overline{q} \equiv \dfrac{K_E}{V_P=1} = \dfrac{m_e\ c^2}{2} = \dfrac{g\ c^2}{8\pi f^2 .1}$ , and $\overline{V} \equiv V_P \equiv \dfrac{c\ .\text{Charge}}{\text{Total−Energy=h}} = \dfrac{c\ .\overline{q}}{h}$ ...(1)

Using the two Energy-equations for ***Linear-motion*** → $f_n = \dfrac{1}{2\pi} \sqrt[2]{\dfrac{k}{m}}$ and ***Orbital-motion***

$a = \sqrt[3]{\dfrac{1}{k\ .f^2}}$ , for **Unit**-Energy-Space-frequency k = g , a = π , then → **g .$f^2$. $π^3$ = 1** ...(2)

Frequency $f_n = \sqrt[2]{\dfrac{1}{g.\pi^3}} = \sqrt[2]{\dfrac{1}{9,808238.\pi^3}}$ =1,8133418.$10^{-3}$ , i.e. **The Unit-Charge-Cave , $\overline{q}$**

into Hydrogen cave [a =1,82043047.$10^{-12}$m].[1,813342.$10^{-3}$/s] = **3,3010625.$10^{-15}$** C

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

**Because Gravitational Force** is equal to → the Geometric-Resultant of light-velocity **c** , acting on **Electron-Unit-Charge $\overline{q}$** ← or , **G = c $\sqrt{2}$ $\overline{q}$** , then Electron-Charge is , $\overline{q} = \dfrac{G}{c\sqrt{2}} = \dfrac{6,680561\ .10^{-11}}{1,41429.[2,9979346.10^{\ 8}]}$ = 1,58.$10^{-19}$ Coulomb , the known Coulomb`s **charge quantity**, From $g_L , k_L$ Universal constants the Newton`s Gravitational constant Force is , $G \equiv g.k_E \equiv g\ .[g_L\ k_L ] \equiv [\dfrac{T^2 P}{a^3}].[g_L\ k_L ] \equiv 9,808238* 6,8116.10^{-12} \equiv 6,68056.10^{-11} \dfrac{m^3}{Ns^2}$

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 $\equiv (\dfrac{v}{2\pi r})$ . [σ + σ Φ] = $\overline{v}$ . [ $\dfrac{\sigma}{2\pi r} + \dfrac{\sigma\Phi}{2\pi r}$ ] $\equiv$ $\overline{v}$ . [.$\boxed{\overline{f_n}}$ + $f_n$ ] $\equiv$ Moving - Storage →[ $\overline{v} .\boxed{\overline{f_n}}$ ] ← + Moving-Frequency → [ $\overline{v}.f_n$ ] ← $\equiv$ Material-Point **i.e.**

The **Energy** produced in **Photon-Cave** is consisted of **Two-moving-Storages** , that travel as **Wave** $[\overline{v}.f_n] \to$[ $\overline{v} .\boxed{\overline{f_n}}$ ] → [ $\overline{v} = \overline{c} = \lambda \dfrac{f}{\Phi}$ ] → [ S $\equiv$ EM-R $\equiv$ $f_{1=N}$ , $f_2$ , $f_3$ , $f_D$ ,,$f_n$= $w^2$ ] , and **as Particle** →[ $f_1$= ($E^2$+$H^2$) = n$\dfrac{(1+\sqrt{5})\sigma}{2\pi r} = \dfrac{n\overline{B}}{\pi^2\ r^4}$] →{W$\equiv$EM-R$\equiv$ [ε$E^2$ + μ$B^2$] = 2.λc.sin.2φ} and is **The Duality** of an **Energy-Storage S** $\equiv$ { $\boxed{[\oplus\leftarrow\ r \rightarrow\ominus]}$ + **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 = $v^2$. r = ( w r )$^2$.r = [ $\dfrac{2\pi}{T}$ r ]$^2$. r = $\dfrac{4\pi^2\ r^2}{T^2}$. r = $\dfrac{4\pi^2\ r^3}{T^2}$ = $4\pi^2.\dfrac{r^3}{T^2}$ = $4\pi^2.r^3.f^2_p$ ........(k)

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

Because (k) is constant , $r^3 . f^2{}_p$ , is also a Constant multiplication of cave , **r** , and the frequency f , and the Work ≡ motion are conserved in cave , **r** , as the , **n** , frequencies

$f_N = n \frac{(1+\sqrt{5})\sigma}{2\pi r} = \frac{nB}{\pi^2 r4}$ , and for a Damping-cave → r(t) = r(t + **w**) ← 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 $k = E = \frac{T^2}{a^3} = g = \frac{1}{f^2 . a^3}$ , i.e. →

**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 **$gf^2 ≡$ the Energy-Part** embodied with stress **$\bar{g}$** , and the cave **$a^3$** , is the **Space-Part** , in 3-DOF Space as →

$T^2 = g a^3 = 9,808238.[ 2 ,1145016.10^{-11} ]^3 = 9 , 2728158.10^{-32}$ s , and Period

$T = 3,04513.10^{-16}$ s , or frequency **f** = $3,2839982.10^{15}$ / s . From equation **E = h f** = $6.62607.10^{-34} . 3,2839982.10^{15} = 2,175999. 10^{-18}$ J / ($1,6022. 10^{-19}$ ) = **13,59999 eV**

**Above Quantized Energy** *of* **13,6 eV** , *corresponds to the Hydrogen-Atom-Cave .*

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

Hydrogen cave constant is $k = E = \frac{T^2}{a^3} = g = [\frac{4\pi^2}{GM}]$ therefore $GM = \frac{4\pi^2 a}{g}$ and from

Newton Total-energy $E = - \frac{GM m}{2 a}$ , Rotational-Momentum $L = \sqrt{(1 - e^2). GMm^2. a}$

Eccentricity e = 0 , G Mm = - 2a.E , and then → $L^2 = GMm^2.a = - 2aE[a] = - 2a^2E$ .

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

**So , Hydrogen-Atom** , is the minimum-Energy-cave In Planck`s-Length , occupying the minimum **Negative-Energy** in Rims ≡ Caves , *the Space* , where Quantum-Energy-Rims are the Plane Traces-Conductors in where can roll the ⊖ charged Electrons .

**In Hydrogen-cave** , the Resonance **Frequency** of an **Electron ⊖** , **and a Proton ⊕** , happens from the Stationary Unit-Cave of a System of Kepler second Planetary-law as equation , $4 \pi^2 m f^2{}_o = k$ , and from constant law of Areas $1 = k . f^2{}_o a^3$ .Their common

Constant-Energy k , is → $k = 4 \pi^2 m f^2{}_p = \frac{1}{f^2{}_p a^3}$ or , $f^4{}_p = \frac{1}{4\pi^2 ma^3}$ and $f_p = \sqrt[4]{\frac{1}{4\pi^2 m.a^3}}$ .

A loop in Planck`s length $2a = L_P = \pi.1,616199.10^{-35}$ m with frequency $f = \frac{c}{\lambda}$ , where

then issues $f^4{}_p = \frac{1}{4\pi^2 ma^3} = [\frac{c}{\lambda}]^4 = [\frac{1}{\lambda}]^4 . \{c^4 = \frac{1}{[4\pi a^3]m\pi a}\}$ , and for the Unit Intensity I = $\frac{Energy}{Area} = \frac{E = hf}{A = 4\pi a^3} = \frac{1KW}{A} = \frac{1}{[4\pi a^3]} = \frac{1}{\lambda^4} \{mc^4. \pi a\} = \frac{1}{\lambda^4}\{1\}.80,760865.10^{32}. (3,14).0,8081.10^{-35}$ =$0,5865.\{ \frac{1}{\lambda^4} \}$, and E-Intension is → **I = 0,5865 . $\{\frac{1}{\lambda^4}\}$** ← or , is the Rayleigh Scattering , **i.e.**

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**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 $\lambda$ .

**In Outer Electromagnetic fields** , frequency , **w** , is that of inner motion $\rightarrow$ **w** $= \frac{2\pi}{T} = 2\pi.f_N$
$\equiv [\frac{1+\sqrt{5}}{2}]\frac{\sigma}{2\pi r} = \frac{\sigma.\Phi}{r}$ **,** 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 $k = \frac{1}{f^2_n.a^3} \rightarrow$ or $1 = k .f^2_n. a^3 \leftarrow$ and from

**Kepler`s laws and Newton`s Lagrange laws** for Orbits , the cave-Semi-major-axis is as ,

$$\mathbf{a} = \sqrt[3]{T^2/k} = \sqrt[3]{\frac{1}{g.f^2}} = \sqrt[3]{\frac{4.\pi^2.r^2}{g.\sigma^2.\Phi^2}} = \sqrt[3]{\frac{[4\pi^2].x\ r^2}{[g.\Phi^2].x\ \sigma^2}} , \text{ and}$$

$$\mathbf{f_R} = \frac{w_R}{2\pi} = \sqrt[2]{\frac{k=1}{g.a^3}} = \sqrt[2]{\frac{\sigma}{g.\Phi^2.a^3}} \equiv \sqrt{\frac{k}{md}} \ \mathbf{eV} \ \dots(a)$$

**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.

**a)... It was shown** that when **two Photons** strike each other , $\vec{c} = \check{c}$ , or reflect on a wall , **then**
c = 0 and so their fundamental frequency $f_1 = n.[\frac{\bar{v}}{2r}]x[\frac{1}{4}] = n.[\frac{\bar{v}}{8.r}]$ which for $n = [\frac{8.\pi rc}{v.\lambda}]$
increases to $\frac{\lambda}{c}$ , therefore for $n = N.[\frac{8.\pi rc}{v.\lambda}] = N.|\frac{c}{\lambda}|$ and for $N \rightarrow \infty$ then $f_1 = E / h = \infty$ ...(b)
In Dual Photon $\bar{v} [\frac{\sigma\Phi}{2\pi r} + \frac{\sigma}{2\pi r}] \equiv \bar{v} . [ \boxed{\bar{f}_n} + f_n ]$ , **Colours** are the **Still-Sub-Units** of Storage
$[ \bar{v} . \boxed{\bar{f}_n} ]$ , and exist as **Frequencies ,** Violet , Blue , Green , which Stabilize with their
Complementary colors Yellow , Orange , Red , of wavelength $d = \lambda \rightarrow \lambda_{min} \approx \lambda_{max} =$
$3.10^{-7}m \approx 3.\sqrt{3}.10^{-7}m$ .

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

**Hydrogen-Energy** $E = h.f_P = [ 6,6262.10^{-34}$ J.s $] . [ 3,28393.10^{15} / s] = 2,176.10^{-18}$ J
and in $eV \rightarrow [2 ,176.10^{-18}] / [1,6.10^{-19}] = \mathbf{13,6\ eV}$ **,**
Above **Quantity of Energy** consist the Hydrogen minimum Energy-Rim , becoming from
equation $\mathbf{a} = \sqrt[3]{T^2/g} = \sqrt[3]{\frac{[3,04513.10^{-16}]^2}{9,80769411}} = 2,1145016.10^{-11}$ m , for Unit energy cave .

**From Angular-Momentum B** $= r.mv = r [\frac{\pi rv}{2}] v = \frac{\pi r^2}{2} v^2 = \frac{\pi r^2}{2}v^2 = \frac{\pi r^3}{2} [n.\pi.c]^2 = \frac{\pi^3 r^3}{2} \mathbf{c^2}$ , or
**Black-Hole-Energy** $\rightarrow \mathbf{B_E = 2.\pi^5.r^3.f^2 = (\pi r)^3.w^2} \leftarrow$ i.e. **Velocity in Black-Holes is Related**
**to Cave , r^3, and Energy w^2 times of light velocity**.

**c)..** Since the Primary motion $\equiv$ [**PM**] exist from the three **Breakages** only , and **STPL** is the
**n** =3 Mechanism creating Elementary Particles $\Rightarrow$ [**n-Knots=3**] in **V** $_{GRA} = 7,593.10^{35}$ **V.**
**Explanations** :

**The Action-Spaces** ≡ The Infinite **Quaternion - monad**s → $\bar{z}$ ≡ ( s + $\bar{v}$.i ) ≡ $\overline{AB}$ ≡
  ≡ $\sqrt{s^2 + [\bar{v}.i]^2}$ , or $\bar{z}$ ≡ x + i . y ≡ $\overline{AB}$ ≡ moduli , r , is their magnitude
  [ r = | r | = $\sqrt{x^2 + y^2}$ ] , on Unit-Diameter $\overline{AB}$ . The **[QMAS]** . For Quaternion |$\bar{v}$| = s
**Breakages** $\vec{z} * \vec{z}$ = (s + $\bar{v}$.i )² = s² +[$\bar{v}$]² +2.s$\bar{v}$.i = s² − $\bar{v}$ ² ± 2.s $\bar{v}$ = |**s**|² - |$\bar{s}$|² ± 2.|s|.|$\bar{s}$| , **i.e.**
  In **Figure** -3-  the **Vector of Amplitude** is Quaternion $\bar{z}$ ≡ x + i . y , with vector $\bar{z}$ , to
  be from Definition of the **Complex Vector Space ,** the **Set of Vectors of length** (the **n**
  Vertices which form the **n** - Polygon Sides , or the **Norm** of  the Complex - Vectors )
a...The **4-Geometrical Spaces** , [ **Space , Anti-Space , Neutral-Space , Sub-Space** ]
  consist   → The **Geometrical - Mould** of $\overline{AB}$ - **Monad** ≡ **[PM-2R-M]** ←
b...The  **Vectors of Amplitude z = 2R** , ON $\overline{AB}$  **Monad** , consist The **Energy-Mould** .
  of  **2R-Form .**The **Physical -Mechanisms** → [ **Physical Mould** of **2R- Monad** ] ≡
  **[GM-AB-M]** ← are such and dependent on the **n - Number of Accessories** they use **.**
**A…** The  **Gravity** Force  **G**  ≡ motion  ≡ σ.**Φ³** , **exists without mass and  is Quantized**
  Spread in{**Space** and **Anti-Space Or** ≡ **QUA** ≡ {**is The Quantized-Units In-Area of**
  **Space and Anti-Space }**, and as a Mould **Φ**  *Golden-Ratio* , exists as  *Impedance* **b**.

**Placing [ Physical Mould** of **2R- Monad ]** **ON** **[ Geometrical - Mould** of $\overline{AB}$ - **Monad ]**
                    **[ PM-2R-M ]**   →   ⇅   ←   **[ GM-AB-M ]**

THEN → **Gravitational-Force G ≡ [ Σ = n . h ]** , and n-NA = 1 ⇒ **Creates & Constructs**,
  For n =1 ABM = **[Σ = n h]** ⇒  G / c = **Charge** $\bar{q} = \frac{G}{c\sqrt{2}}$ =  1,58.$10^{-19}$ Coulomb .

**1)**..→ g ← **G** ≡ σ.**Φ³** ≡ g. $k_E$ ≡ g .[$g_L$ $k_L$] ≡ [$\frac{T^2_P}{a^3}$].[$g_L$ $k_L$ ] , and g = $\frac{G}{k_E}$ = [$\frac{6,673692 .10^{-11}}{6,8116 .10^{-12}.}$]

  ≡ **9,8076941** . Gravity-Acceleration in Black-holes g $_G$ = [ $\frac{\pi r v^4}{2}$].$e^3$ = **9,808238** m/s .

For  b = 36.$10^{-20}$ ,  $\bar{v} = \frac{F\Phi}{A}$ = [$\frac{G\Phi}{A}$] = [$\frac{6,673692 .10^{-11}.1,6180339887}{36 .10^{-20}.}$] = **2.9895163**.$10^8$ m/s

**2)**.. → $\bar{c}$ ← $\bar{v} = \bar{c}$ = σ . Φ = $\frac{F}{A}$ Φ = [$\frac{G\Phi}{A}$] = [$\frac{6,673692 .10^{-11}.1,6180339887}{36 .10^{-20}.}$] = **2.9985163**.$10^8$ m .

**3)**.. → $\bar{q}$ ← from **G = c $\sqrt{2}$ $\bar{q}$** , Electron-Charge is , $\bar{q} = \frac{G}{c\sqrt{2}}$ = **1,58.$10^{-19}$** Coulomb ,

**B…** The{**TVPM} Mechanisms** , from **Charges** on Two-Perpendicular-Vectors-Edges ≡
  Markos Two-Vectors Three-Poles Mechanism is **case {QUA}** ≡ **[ Σ = n . h ]** ⇒ ∞ x **Φ**
  which is **the Physical Mechanism** , and gives the ∞ - *Impedance* **b** , determining the
  *Objective Reality* which is the **existing Universe .**  The two ⊥ Vectors Produce the  ∞
  Squares ∞ , $\overline{AB}$ **Monad** ≡ ∞ - [ **GM-AB-M** ] with  ∞ , **2R-Form** [ **PM-2R-M** ]  and
  **n** ≡ ∞ **Number of Accessories** , as from monad R = $\frac{\sigma}{J.w^2}$ = $\frac{\sigma}{B}$  and velocity $\bar{v}$ ≡ ± **σ Φ** .

**C…**Primary motion ≡ **[PM]** exist from the three Breakages only [**s² = ⊕ ,2s² = ∅, - s² = ⊖**] ,
  **on Triangle 3-Knots** with **n** ≡ **3** Number of **Accessories** , therefore [**STPL]** Mechanism
  is the  **n = 3** Accessories-Mechanism creating the Elementary Particles , [**n-Knots**=3] in
  the Gravity Voltage  ⇒  **V** $_{GRA}$ = 7,593.$10^{35}$ V.  **This Physical Mechanism** creates the
  Elementary Particles  their  **n = 1 - ∞ , masses** of  Atom`s  & Compounds determining
  their **Atoms Complex-Vector-Response** .These sparse Particles  exist in all of the

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

universe in the sense that they are uniformly distributed .

**D…The { TCIC } Mechanisms** ≡ **[ Σ = n . h ]** ⇒ 8 x ① is **the Physical Mechanism** , from **Charges** In Three-Vectors-Conductors-Edges ≡ *Markos  Tetrahedron Cube Inscribed – Circumscribed Circles* .The Tetrahedron **Conductors** -Vectors  $\overline{DA} \perp \overline{DB} \perp \overline{DC}$ **Curry** Energy as **Electromagnetic-Fields**  (Forces-Frequencies-Stresses-any motion) **TO**  the Inscribed Sphere (Nucleus of Atoms), **TO**  Cube Vertices (Electrons-Position) ,**TO** the Circumscribed Sphere  (The Electrons Orbits) for Equilibrium and for **transferring Information**  and **Signals** . **a..  The Protons and  the Nucleus Structure** :

From above [**GM-AB-M**] ≡ **8** x **[(+)[↔](-)]** ≡ Neutral = **n** , then

a...  For **1** Proton [(+)[↔](-)]↔(+)  ≡ Neutral                    →    n = 1    p = 1

b...  For  **2** Proton **(+)**↔[(-)↔(+)][(+)↔(-)]↔**(+)**  ≡ Neutral    →
$$\begin{array}{cc} p & n \\ n & p \end{array}$$

c...  For **3** Proton **(+)**↔[(-)(+)][(+)][(-)(+)]**(+)**[(-)(+)] ≡ Neutral        →
$$\begin{array}{ccc} n & p & n \\ p & n & p \end{array}$$

d...  For **4** Proton **(+)**↔[(-)(+)][(+)][(-)(+)]**(+)**[(-)(+)]**(+)**[(-)(+)]        →
$$\begin{array}{ccc} p & n & p \\ n & 0 & n \\ p & n & p \end{array}$$

h...  For **k** Proton **(k1)**↔[(-)(+)]**(k2)**[(-)(+)]**(+)**[(-)(+)]**(+)**[(-)**(h$_k$)**]   →
$$\begin{array}{ccc} kp & kn & kp \\ kn & 0 & kn \\ kp & kn & kp \end{array}$$

where   **n-NA ≡ k ≡  The** Number of **Accessories of {TCIC} Mechanisms ≡ [ Σ = n . h ]**

**On** →
$$\begin{array}{ccc} kp & kn & kp \\ kn & 0 & kn \\ kp & kn & kp \end{array}$$
k - Space  [ **GM-AB-M** ] .

From above is seen the Way of Atoms Construction. (**Geometrical-Mould** of $\overline{AB}$-**Monad).**

**E…From Energy** = motion / T ≡ $(\frac{v}{2\pi r})$.[σ+σ Φ] = $\bar{v}$.[ $\frac{\sigma}{2\pi r}$ + $\frac{\sigma\Phi}{2\pi r}$ ] ≡  $\bar{v}$ . [.$\boxed{\overline{f_n}}$ + **f$_n$** ] ≡ Moving

Storage →[ $\bar{v}$ .$\boxed{\overline{f_n}}$  ] ≡ [**GM-AB-M**] ← + Moving-Frequency → [$\bar{v}$.**f$_n$**] ≡  [**PM-2R-M**] ← ≡

[ **Σ = n . h ] ,** and **n-NA = 1** ⇒  Material-Point   **i.e.**  The Energy produced in Photon-Cave is

consisted of Two-moving-Storages that travel as Wave  [$\bar{v}$.**f$_n$**] →[ $\bar{v}$ .$\boxed{\overline{f_n}}$  ] → [ $\bar{v}$ = $\bar{c}$ = λ$\frac{f}{\Phi}$ ] →

[S≡ EM-R ≡ f$_{1=N}$] & as Particle→[ f$_1$ = (E²+H²) = n $\frac{(1+\sqrt{5})\sigma}{2\pi r}$ = $\frac{n\bar{B}}{\pi^2 r^4}$]→{W≡EM-R≡ [εE²+μB²]

= 2.λc.sin.2φ} and The Duality  of an **Energy-Storage** ≡{[**GM-AB-M**] ≡ S = $\boxed{[\oplus \leftarrow\ r\ \rightarrow \ominus]}$

+ Motion ≡ [**PM-2R-M**] ≡M≡ $\boxed{\bar{v}\ -\ \textbf{Vector}}$ } , issuing [**PM-2R-M**] = $\sqrt{-1}$ .[**GM-AB-M**] , **Therefore** → Photon-Mechanism  is for **Both travelling  as Particle**  and  **as Wave** ,

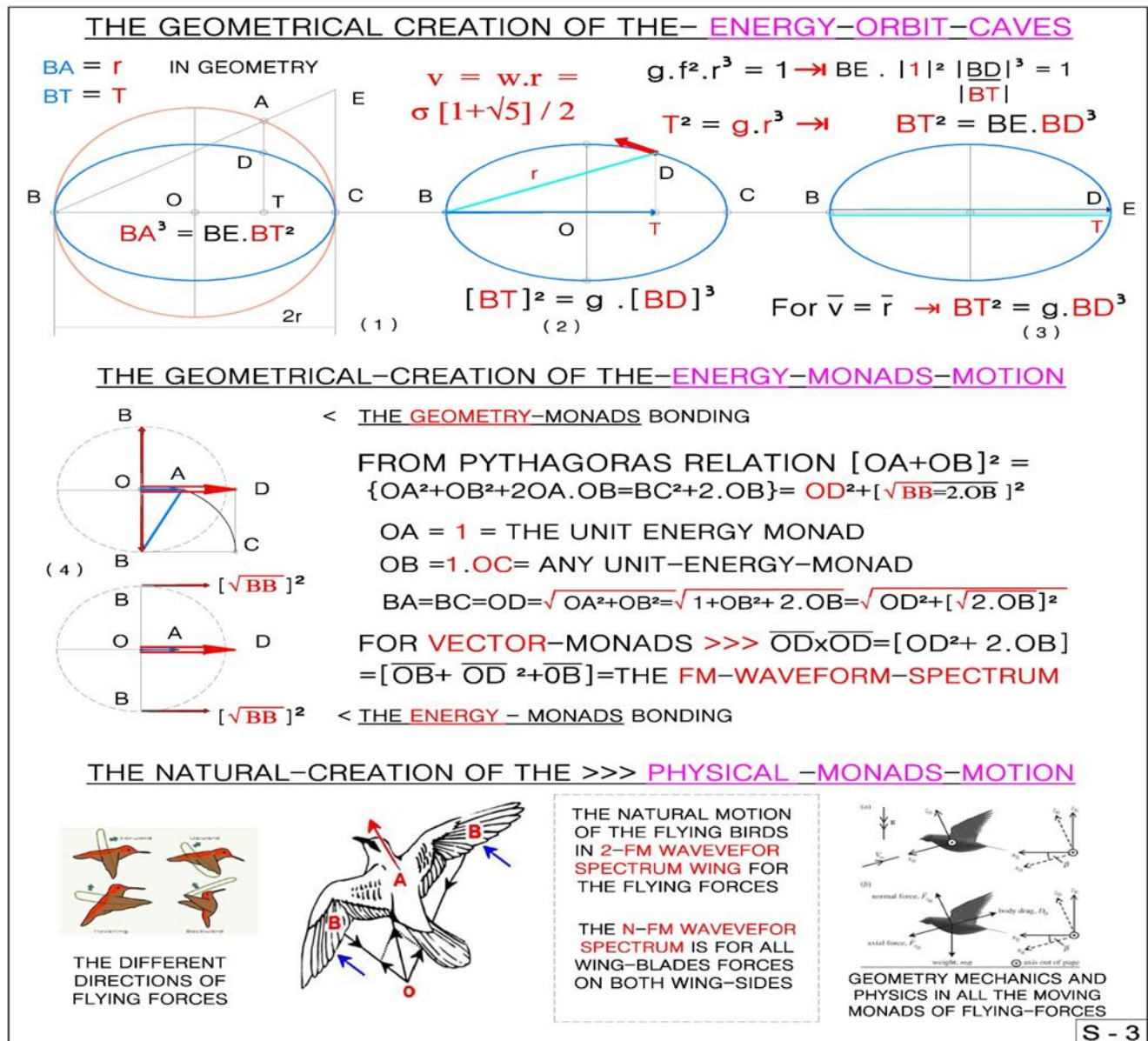### 6c.. THE  EPILOGUES  OF PRIOR .



**Figure – 17 :  The Periodic** motion in Caves follows **Material - Geometry rules** .

**In (1)**. Is shown the **Geometrical** Expose of , Dynamic-Space-Energy relation  $g \cdot r^3 \cdot f^2_p = 1$

**In (2)**. Is shown the **Mechanical** Impress of the , Orbit-Space-Energy relation   $g \cdot r^3 \cdot f^2_p = 1$

**In (3)**. Is shown the **Extreme Design** of the , Dynamic-Space-Energy relation  $g \cdot r^3 \cdot f^2_p = 1$

**In (4)**. Is shown the Geometrical Creation of The **Energy-monads-motion** & The **Physical Monads - motion** from their **Unit - relation**  $g \cdot r^3 \cdot f^2_p = 1$

### THE  ORIGINATION  OF  ANTI – GRAVITY - STRESS  -  g :

### 6c1..  The Origination  & The Nature of  Gravity  g .

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .
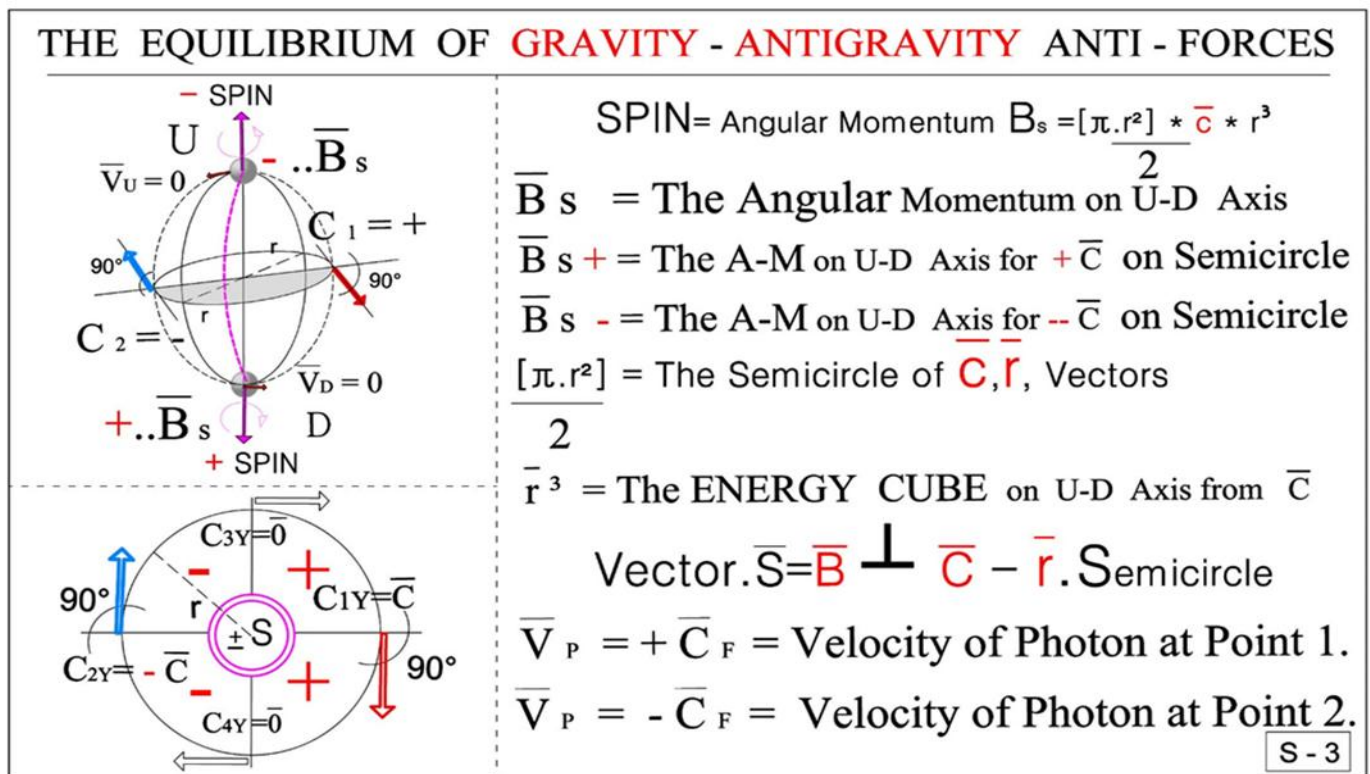
**Figure -17a-**:**The Stability** of ±**SPIN** as an Electromagnetic Wave of Two frequencies ,0, c

From relation Angular Velocity $c = w\, r = 2\pi f_n.r = 2\pi r\,.f_n = \sigma\,\Phi$ . Since light-velocity is created from G beyond the Planck`s length $r_P = 1{,}61626.10^{-35}$ m , therefore issues $c = w\,r = w\,r_P = 2\pi\, r_P\,.f_n = \sigma\,\Phi$ , and from the light-velocity Properties becomes ,

**a)..** 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 (8) 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 . $\lambda$ , as $\lambda$ / 4 . in distance with $90° = \frac{\pi}{2}$ 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 **.** The Light velocity $\bar{c}$ **, changes Phase** every 90° and the **created Work** { W = $c_y$ x [**Quarter circle 1-O-4**] } is Symmetrically **Stored** from $0° \rightarrow 90°$ alternately + , - , - , + , in [**Quarter circle 1-O-4**] in the [**Quarter circle 4-O-2**] into [**Quarter circle 2-O-3**] into [**Quarter circle 3-O-1**]

The Momentum ≡ Spin ≡$\bar{\bar{B}}$≡ r m v = [ $\frac{\pi.r^2}{4}$ ].$\bar{c}$ x $\bar{r}$ where ± [ $\frac{\pi.r^2}{4}$ ] = The **Quarter circle.**

The **Quarter circle , + + ,** consist the + Spin ≡ $\bar{\bar{B}}$ which is the Gravity Force , and the **Quarter circle , - - ,** consist the -Spin ≡ $\bar{\bar{B}}$ which is the Gravity Force from Total ,+, -,-,+, **When r → 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 $\bar{\bar{G}}$ , Stops Acting

thrusting , on The Light velocity Vector $\bar{c}$ , and happen the Black-Holes .

**b).. The Dual Property** of the Simultaneously existing **Spin as Electric** and as **Magnetic**

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**Field** in wavelengths , $\lambda_x$ , $\lambda_y$ , as Effective Range , is thrusted through the Light velocity $\bar{c}$ , and finally is from the **Newton's Gravitational Force $\bar{G}$ .** In Planck`s length $r_P = 1{,}616255.10^{-35}$ m the created Work from $\bar{c}$, on 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 $+ [\frac{\pi.r^2}{4}] =$The +**Quarter circle** [1-O-4] , and the

$- [\frac{\pi.r^2}{4}] =$ The - **Quarter circle** [4-O-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 $g.a^3.f^2{}_n = 1$ , $f^2{}_n = \frac{\sigma^2}{4\pi^2 r^2} \Phi^2 =$

$= \frac{1}{g.a^3}$ then $g.a^3.\Phi^2 = \frac{4\pi^2 a^2}{\sigma^2}$ , or **1)**. $a = \frac{1}{g} [\frac{2\pi}{\sigma \Phi}]^2$ , 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 $2E = \bar{B}f_n = [\frac{(1+\sqrt{5})\sigma}{4\pi r}].\bar{B} =$

$[\frac{\sigma}{2\pi r}].\bar{B} \Phi$ , or $E = [\Phi \frac{\sigma}{4\pi r}].\bar{B}$ i.e. The **Energy in Planck-cave-Particles** is Dependent on

their **Spin only** , and for Electron $r = a_e \rightarrow E = [\Phi \frac{\sigma}{4\pi.r}].\bar{B} = 1{,}6180339 [\frac{1}{4\pi.1{,}6840307.10^{-17}}] x$

x $2{,}845976. 10^{-17} = \frac{21{,}76.10^{-19}}{1{,}6.10^{19}.} = $ **13,6 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 $\overleftarrow{O3}$ , $\overleftarrow{O2}$ , $\overleftarrow{O4}$ , 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

$$\bar{B} = r.mv = r [\frac{\pi.r^4}{2}]. 2\pi f r = \pi^2.r^6.f . \text{ and } B = J w \qquad \text{i.e.}$$

Angular Momentum $\bar{B} = r m v = \frac{J.w}{2} = [\frac{\pi.r^4}{4}]\frac{c}{r} = [\frac{\pi.r^3}{4}].\bar{c} = [\frac{\pi.r^2}{4}].\bar{c} \times \bar{r}$ ......(a)

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

For $\bar{r} = \pm \bar{r}$ , then $+ \bar{B} = +$ Gravity – Spin $= + [\frac{\pi.r^2}{4}].\bar{c} \times \bar{r}$ , The **+ Gravity Force**

$- \bar{B} = -$ Gravity – Spin $= - [\frac{\pi.r^2}{4}].\bar{c} \times \bar{r}$ , The **-Antigravity Force**

From Momentum relation $\bar{B} = m\,r\,v = m\,r^2\,w = m\,r^2\,(2\pi f) = \frac{J.w}{2} = [\frac{\pi r^4}{2}].[2\pi f]$ then Spin S $\equiv$

Angular-Momentum $\bar{B} \equiv \bar{S} = \frac{J.w}{2} = \frac{\pi r^4}{4}[2\pi f] = \pi^2.r^4.[f] = \frac{\pi.r^3 \Phi.\sigma}{2} \equiv \frac{[1+\sqrt{5}].\sigma.\pi.r^3}{4} = \frac{\pi r^3 \sigma.\Phi}{2}$ ..(b)

For $\bar{r} = \pm \bar{r}$ , then $+ \bar{S} = +$ Gravity – Spin $= + \frac{\pi.r^3 \sigma.\Phi}{2}$ , **The Gravity Spin**

$- \bar{S} = -$ Gravity – Spin $= - \frac{\pi r^3 \sigma.\Phi}{2}$ , **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 $\rightarrow [\bar{B}]^2 =$

$[\frac{\Phi J\sigma}{r}]^2 \leftarrow$ while from Gravity-force $\mathbf{F_G} \equiv \mathbf{m_G}g = g.⬚[\sigma\,c].r = \mathbf{m_G}\frac{c^2}{r} = Jw^2.\mathbf{g_G} = \frac{v^2}{r}.[\frac{\pi r^4}{2}]\frac{v^2}{r^2} =$

$\frac{\pi r v^4}{2}$, and Gravity-Acceleration $\pm \mathbf{g_G} = [\frac{\pi r v^4}{2}].\,e^3$ , *Geometry Growth*

$$[\frac{\pi r v^4}{2}] = [\frac{3,1415926([\sqrt{5}+1].\sqrt[4]{2}.10^{-35}).(2,99793458.10^8)^4}{2}].e^3 =$$
$$= 6,044981.10^{-35}. \, 80,773378.10^{32}. \, 20,085536 = \mathbf{g_G} = \pm \, \mathbf{9,8076925} \, .$$

**i.e.** Gravity $+ \mathbf{g_G} = + 9,8076925 = \frac{\vartheta r\bar{c}}{\vartheta t} = + \bar{S}$ , and Antigravity$= - \mathbf{g_G} = - 9,8076925 = \frac{\vartheta r\bar{c}}{\vartheta t} = - \bar{S}$

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** . *Centripetal force*

Originates the Two-Momentum $\pm \bar{w}$ , $\bar{B} = r\,m\,v = [\frac{\pi r^3 \sigma.\Phi}{2}] \equiv$ Gravity – Antigravity – Spin.

### 6c2.. 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 $\mathbf{E_T} = \mathbf{E_K} + \mathbf{E_U} = \frac{1}{2}[\dot{x}]^2 + U(x) =$ constant …..(**1**) where $\mathbf{E_K} =$ The Kinetic

Energy and $\mathbf{E_U} =$ The Potential Energy . For $y = \dot{x}$ then , $y = \dot{x} = \pm \sqrt{2.[\mathbf{E} - \mathbf{U(x)}]}$ …(**2**)
The differential equation of motion in cave $\bar{c}$ - r , for Conservative Systems is $\ddot{x} = f(x)$ and

Because $\ddot{x} = \dot{x}(d\dot{x}/dx)$ then $\dot{x}.d\dot{x} = f(x)dx = 0$ ..(**3**) By Integrating then $\frac{\dot{x}^2}{2} - \int_0^x f(x)dx =$

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

E , and by comparison to Priors  then $\rightarrow$  U(x) = - $\int_0^x f(x)dx$  or  f(x) = - $\frac{dU}{dx}$ = $\ddot{x}$  …(4)

**i.e. For the Conservative System** , of cave  $\bar{c}$ - r ,  the force = $\bar{\bar{B}}$ = r m $\bar{c}$ = $\frac{J.w^2}{2}$ = [ $\frac{\pi.r^2}{2}$ ].$\bar{c}^2$ is

**Equal  to the Negative Gradient of the Potential Energy** Into 2-**Energy Semi-circles**.

For y = $\dot{x}$  then (**3**) becomes $\frac{dy}{dx} = \frac{f(x)}{y}$ = $\Phi$ (x , y ) , and the Singular Points correspond to

f (x) = 0 , and y = $\dot{x}$ = 0 and hence are the Equilibrium Points . For every Point x , y in the Phase-Plane for which  $\Phi$ (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(x , y) = C $\neq$ 0 then the Slope of the trajectory is infinite and angle $\varphi$ = 90$^e$ .  Since motion in cave  $\bar{c}$ - r ,  is a **single-DOF oscillator** , then motion equation is  $\ddot{x}$ + w$^2$ x = 0 .Equation indicates that at the Equilibrium Singular Points , 3 , 4 , the Slope of the Potential **Energy curve U(x)** must be zero, meaning **minima or maxima** , and which is  the  $\pm$ **change** of direction for the Four Energy- Quarter circles  [1-O-4] , [4-O-2] , [2-O-3] , [3-O-1] in  ( c$_x$ , c$_y$ ) where  $\overline{c_y}$ =  $\bar{c}$ = Spin Direction ,
**Conclusions :**

**1…** From A-Momentum $\bar{\bar{B}}$ = r m $\bar{c}$ = $\frac{J.w^2}{2}$ = $\frac{1}{2}$ [$\dot{x}$]$^2$ +U(x) = $\frac{1}{2}$ [ y]$^2$ + $\frac{1}{2}$ k x$^2$ = constant , then

Spin S $\equiv$ $\bar{B}$ = $\frac{1}{2}$ [y]$^2$ + $\frac{1}{2}$ k x$^2$ = [y] $^2$ + w $^2$ x$^2$ = C = Constant , or  $\rightarrow$  y$^2$ + w$^2$ x$^2$ = C $\leftarrow$….(a)

Equation (a) is a series of Ellipses determined by C , and **for w = 1**   y/w = y  then reduce
    to circles  y$^2$ + x$^2$ = C , in  $\bar{c}$ - r  Plane and Perpendicular to  S  since , [ $\bar{c}$ - r ] $\perp$ $\bar{S}$ .
**2…** In the Conservative System of cave  $\bar{c}$ - r , where  $\bar{c}$ = Light-Velocity = 2.9985163. 10$^8$
m/s **,** r = Planck`s -Length = $\sqrt[4]{2}$. 10$^{-35}$ m , **motion in cave** is an **single-DOF oscillator** as equation  $\ddot{x}$ + w$^2$ x = 0 . Equation of motion is a circle on where exist  the 2-Singular Points

3 , 4 , meaning  **minima or maxima** , where issues $\frac{dy}{dx} = \frac{f(x)}{y}$ = $\Phi$ (x , y ) ,  and are in the

Mode-Shapes at the Points of Equilibrium . At  Singular Points  3 , 4 , Velocity $\overline{c_y}$ =  $\bar{c}$ = 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 $\overline{c_y}$ = + $\bar{c}$ because of $\overline{c_y}$ , +$\downarrow$ direction and corresponds the Spin $\bar{S}$
    = Gravity = $\bar{\bar{B}}$ = r m $\bar{c}$ which is Constant and equal to Work = $\overline{c_y}$ x [Quarter circle 1-O-4]
    At Point 2 , Velocity $\overline{c_y}$ =  - $\bar{c}$ because of $\overline{c_y}$ , -$\uparrow$ direction and corresponds the Spin $\bar{S}$ =
    Gravity = $\bar{\bar{B}}$ = r m $\bar{c}$ which is Constant and equal to  Work  = $\overline{c_y}$ x [Quarter circle 2-O-3]
    where  the [Semicircle 4-1-3] = + $\bar{\bar{B}}$ $\equiv$ The Gravity , **and** [Semicircle 4-2-3] $\equiv$ - $\bar{\bar{B}}$ = The

Antigravity .The produced Work from the eternal Rotation is store in the Semicircles as ,

(+) **Total Work** = [Semicircle 4-1-3] = $+ \overline{S}$ and (-) **Total Work** =[Semicircle 4-2-3] = $- \overline{S}$

**4…**From Newton`s law of Universal Gravitation $\mathbf{m \ r . \ \overline{w}^2 = G \frac{m.M}{r^2}}$ , and when $\mathbf{m = 1}$ , issues

$\overline{\mathbf{w}}^2 = \frac{\mathbf{G.M}}{\mathbf{r}^3}$ , and B = J w , therefore angular velocity $\overline{\mathbf{w}} = \pm \sqrt[2]{\frac{GM}{r^3}} = \sqrt[2]{\frac{G\pi.r4}{2.r^3}} = \sqrt[2]{\frac{\pi.Gr}{2}}$ .

**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** $\equiv \mathbf{f_n} = (\frac{n\sigma}{8\,r^2}).\overline{\mathbf{B}}$ , **so** Energy-caves are Stationary Wave-Fringes

**5… The Total-Energy** , $E_T$ , in Caves , [70]

**a…** → **In any Moving System** $E_T = E_R + E_K = \frac{\pi c^2}{8} r^3 + \frac{1}{2} m.v^2 = 3,535.10^{16}. \ \mathbf{r^3} + \frac{1}{2} m.\mathbf{v^2}$ ,

**b…** → **Light-Velocity** $\overline{c}$ of Photons becomes from the **Action** of G on Plancks Length $L_P$ = $r_P$ =1,6162.10$^{-35}$ m **cave** r, and when cave $\mathbf{r} = \frac{h}{c.Z_c} \neq \mathbf{L_P}$ originates Hydrogen-cave.

It is shown later that when the **G action Area - Resistance** $\equiv$ Gravitational-Impedance $Z_{G-I}$ = 6,344907.10$^{-35}$ Kg differs for any reason then Black-Holes happen.

**c…** → **Euler`s Rotating Rigid Body** .The D-Work is $W = 2L = \overline{B} . \overline{w} = J .w^2 \equiv h. f_n$ , and for **m** mass $W = h \ f_m$ ,Angular-Momentum $\overline{\mathbf{B}} = \frac{2L}{\overline{w}} = \frac{2L}{2\pi f} = [\frac{2L}{2\pi}].[\frac{1}{f}] = \frac{Constant}{2\pi} [\frac{1}{f_m}] = \mathbf{SPIN}$

**d…** → **In Central-motion** ,Kepler constant $k = 4\pi^2. \ r^3. f_P^2$ , or $1 = [\frac{4\pi^2}{k}] r^3. f_P^2,\ \mathbf{1 = c \ . \ r^3. \ f_P^2}$ where for → $\mathbf{r \to 0}$ then $\mathbf{f_P \to \infty}$ ← , a case of **a Black-Hole** in any Central motion .

**e…** → **The Vibrations in Orbit-Systems** are as → $W = 4\pi^2 .[\frac{r^3}{T^2}] . \overline{n} = 4\pi^2. \ r^3. \ \mathbf{f^2_P} . \overline{\mathbf{n}}$ ←

**f…** → **In [PNS] Neutral Space** , Dumping force is $F_d = C . \dot{r} = \pm \ C_o .w. [\sqrt{A^2 - r^2}]$

and $F_d^2 / [\ C_o .w. \ A\ ]^2 + r^2 / A^2 = 1$ , **i.e.** Energy $\equiv$ motion is mapped as an Ellipse with axis , $\mathbf{F_d}$ , x , and *Energy Dissipated Per - Cycle* , the **Area** enclosed by **ellipse**.

**g…** → **The Energy in [PNS]** , is either as momentum (**mv**) or as Rotational Momentum ($\mathbf{\Lambda = r.mv}$) . Velocity $\dot{x}$ , in form $\dot{x} = w \ A \ cos.(wt - \theta) = \pm wA.[\ \sqrt{1 - \sin^2(wt - \theta)}\ ]$ $= \pm w \ . \ [\ \sqrt{A^2 - x^2}\ ]$ where momentum relation $\overline{\mathbf{B}} = m \ r \ v = m \ r^2 \ w = m \ r^2 \ (2\pi f) = \frac{J.w}{2}$ $= [\frac{\pi r^4}{4}].[2\pi f] = \frac{\pi^2 r^4 f}{2}$ ,and Mass of Elementary-Particles is $\mathbf{m} = \frac{\pi^2 r^4 f}{2w.r^2} = \frac{\pi^2 r^3}{2v} f = \frac{\pi^1 r^2}{4}$ , **or** The repeated **Quarter circle** [ $\frac{\pi.r^2}{4}$ ] Surface of the $\pm$ **Spin Dual Property** In Planck`s length and area , $\mathbf{A_{QC}} = [\frac{\pi.r^2}{4}] = \frac{3,1415926.(\sqrt[4]{2}.10^{-35})^2}{4} = 1,1107206.10^{-70}$ m² . Since issues the **monad of mass** to be [ $\frac{eV}{c^2}$ ] = 1,782662.10$^{-36}$ Kg , then Energy *Dissipated Per - A* $_{QC}$ = $\mathbf{E_{QC}}$ = ( 1,1107206.10$^{-70}$ m²/ 1,782662. 10$^{-36}$ = 6,230715. 10$^{-35}$ Kg , **Or** from the **G action** Area - Resistance $\equiv$ **Gravitational-Impedance** $Z_{IQC}$ , exists $Z_{IQC} = \sqrt{2}c^3 A_{QC} / G$ , and $\mathbf{m_{PNS}} \equiv Z_{IQC} = \sqrt{2}.c^3 A_{QC} / G = \frac{1,4143.(27.10"24)1,1107206.10^{-70}}{6,680056.10^{-11}}$ = 6,344907.10$^{-35}$ 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]

83

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**h…** → In [MFMF] Space , **Work = motion = Energy** is zero as $W = \int_B^A P.\,ds = 0$ , and this because ds = $\vec{v}$ = 0 and Time is not existing and $\vec{v}$ = 0  as relation  , $s = \vec{v}.T$ . 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 → ds = 0  and **P** = ∞ . Since Impulse  is  ∞  then may  be → Vacuum  , Momentum  or  Potential  or  Induced  Potential and it is  a Type of  Effect , to  Push the nature → (Impulse ≡ Motion ≡ Energy) ←

**6c3.. The Nature of  Antigravity  (- g ) .**

 **From Mechanics in case that ,** *in an Axisymmetric Rotating Body , with constant Angular-Velocity ,* **w** *,* ***the moment of Inertia*** *,* $J_x = J_y$ *, is equal about the two of the three Principal axis ,* ***and then*** *,*

**1.. The Angular – velocity - vector ,** $\overline{w}$ **,** describes the Ellipsoid of Angular Velocity and its nib describes a Cone of which Plane-Base is Fixed ***Simultaneously*** ,

**2.. The Angular-Momentum ,** $\overline{B}$ **,** 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 ,** $\overline{w}$ , describes on the Tangential-Plane of the Angular-Momentum-Ellipsoid , **the Herpolhode** , while ,

**4.. The Nib of Angular-Momentum  ,** $\overline{B}$ , describes on the Tangential-Plane , of the Angular-Velocity-Ellipsoid , **the Polhode** .

**5.. The Fixed-Tangential-Planes on ,** $\overline{w}$ **, and ,** $\overline{B}$ **, nib** are alternately Perpendicular to , $\overline{B}$ , and , $\overline{w}$  , common Central Axes of Rotation .

**6.. The Kinetic Rotational – Energy of monad ,** which is the Work in monad **,** *is the Scalar quantity ,* **L** *, The Vector Angular Momentum quantity* is **,** $\overline{B}$ **,** and the *Vector of Angular-Velocity quantity* is **,** $\overline{w}$  **,** *which Three monads are related as* $\overline{B}.\overline{w} = 2L = J.w^2$ where  **J** = The moment of inertia around the axis of rotation = ⇅

**7..All above happen in ,** Material-Point **,** *where the Positive* ⊕ *constituent* **The** $+ \overline{c}$ **,** is *Eternally self - rolling on the*  **Negative** ⊖ **constituent ,The** $- \overline{c}$ **,** with Angular-Velocity **w** *, in Infinite  Spherical traces , either at Great-circles* [+ or - ] *, or Small-circles ,* [+] where is the  Clockwise Left direction and [-] where is Anti-Clockwise Right direction or *any other close Spherical-curve ,* **and** *Applying all laws of Mechanics into this Energy Chaos , is thus created the* → **First–Discrete-Energy–monad** $\overline{B}$ *, the Material Point* ← **i.e.**  The Angular Momentum  $\overline{B}$ , is the Quantum of Physics and is *, for all the Energy – Space-Universe .*The Energy = E dissipated per cycle is equal to the Work $W_d = E =$ h f $= \frac{h(1+\sqrt{5}\,)}{4\pi}.[\frac{\sigma}{r}] = 8.k\zeta(\pi r^2)$ and is ***Stored in monad*** , *which is a Stationary Wave with* ***and - in***   *, n , loops as*   $W_n = [\frac{4\pi r^2}{3}].f_n = [\frac{4\pi r^2}{3}].nf_1 = n\frac{(1+\sqrt{5})\sigma r}{3} = n\frac{[\sigma\Phi.r]}{1,5}$ .

 **8.. Geometry has as Monad ,** *The discrete continuity* $\overleftrightarrow{AB}$ -length becoming from the *Zero*

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

*Point* ≡ 0 , and **Mechanics-Physics** the Recent-Acquisition of **the Material - Geometry**, where **Zero-Point ,** 0 = ∅ = {⊕+⊖} = **The Material-Point** = *The Quantum of Space ,* **as** *,* The **Positive Space** and **The Negative Anti-Space** . [58]

In **Fig-8** , The Light velocity vector $\bar{c}$ = 2,9979. $10^{8}$ m/s Rotates In the Planck`s length Perimeter $r_P$ = 1,616255.$10^{-35}$ m , and is thrusted through The Newton's – Gravitational Force $\bar{G}$ , During Rotation is created Work which is stored in the circle

Surface as Angular - Momentum $\bar{B}$ = r m v = $\frac{J.w}{2}$ = $[\frac{\pi.r^4}{4}]\frac{c}{r}$ = $[\frac{\pi.r^3}{4}].\bar{c}$ = $[\frac{\pi.r^2}{4}].\bar{c}$ x $\bar{r}$ , in

Semi circle {+[ 4 -1-3]} , and Semi circle { - [ 4-2-3] }, for the Stability of Equilibrium .

**i.e. Gravity + g ≡ The Vector of Angular-Momentum $\bar{B}$ ≡ + Spin ≡ ↓↻ ≡ 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 in ,** + ↓ $\bar{c}$ *Direction* .

**Antigravity - g ≡ The Vector of Angular -Momentum $\bar{B}$ ≡ - Spin ≡ ↑↻ ≡ 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 in** **The ,** - ↑ $\bar{c}$ *Direction* .
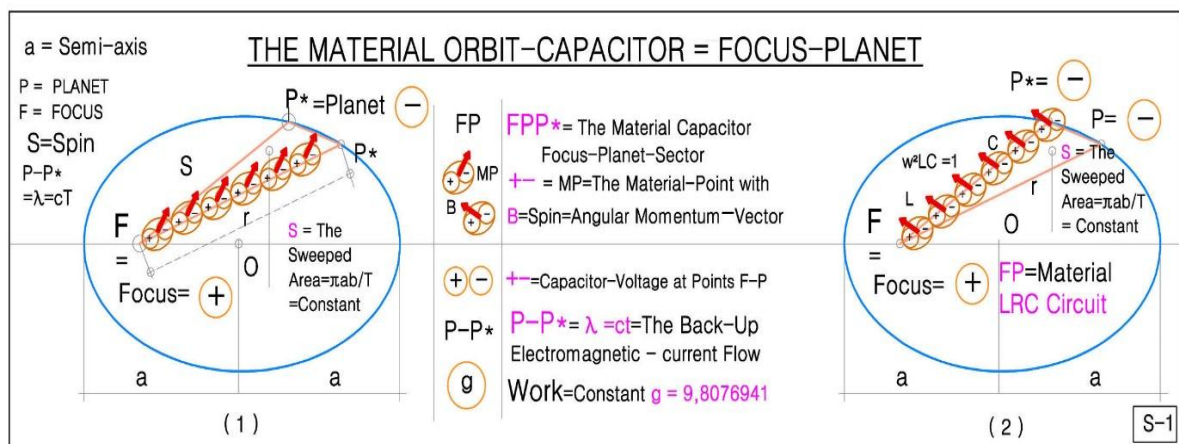


**Figure – 17b -** The Material , **LRC Circuit** on **Orbit** , on Focus-Planet-Sector |F↔P|

**In (1)**. Force **g** , as Wave , is directed to the center of rotation **F** , and is proportional to the distance **PF** ≡ Focus - Planet .The Gravitational Potential-Energy $g_G$ = **9, 8076925** is stored in → Focus-Planet-Sector ≡ **FP** ← which is the Material Capacitor Stores charge *as that of Material-LRC-circuit* , and Inductors .

Because of the chains of Spins and of their Periodic excitation [↔] , is thus created a Magnetic field due to the LRC-circuit and which is tuning to the critical Quantum and critical-State $g_G$ . The chains of Spins are Pointy - vibrating with their characteristic

85
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

frequencies $f = \frac{(1+\sqrt{5})\cdot\sigma}{4\pi r} \bar{B}$ , and **filling up** the entire universe . Since Inner-stresses

$\boldsymbol{\sigma_{1,2}} = \sigma_1/2 \pm (\frac{1}{2})\sqrt{\sigma 1^2 + 4.\sigma 1^2} = \sigma_1/2 [1\pm\sqrt{5}]$ follow the ***Golden ratio on stresses*** 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 $\dot{x} = w.r \rightarrow w = \dot{x}/r$ then ***Golden ratio Damping-Force*** is the Work produced with Unit Damping-ratio $\zeta=1$ .Since also $\dot{x} = v$ then

exists , $F_d = c.\dot{x} = 1m.w_n.\dot{x} = 1.[(\pi r^2/2) v^2].\frac{\dot{x}^2}{r} = [\frac{\boldsymbol{\pi r v^4}}{\boldsymbol{2}}] = g = \frac{\boldsymbol{2}}{\boldsymbol{r}}[\sigma(1+\sqrt{5})]^2 = \frac{\boldsymbol{4\sigma^2}}{\boldsymbol{r}}[3+\sqrt{5}]$ .

> 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 Glue-bond . This may be considered as a Type which happens in ***Black holes*** as this happens in algebra inverse fractions also .

**In (2)** is Presented the Back-Up Electromagnetic current flowing in Opposite direction FP , by changing the **Spin Direction** of the Sector-Material-Points such that work W = g . From Kepler`s 2nd law the , ***Area* S** , swept by any ***Focus-Planet-Sector*** ≡ **FP** is the constant **k** , and equal to,

$S^2 = \frac{L^2 T^2}{4m^2} = \pi^2 a^2.[b = \pi a (\frac{L^2}{2mE})]$ , or $\frac{T^2}{a^2} = \frac{4\pi^2 m}{2E} = \frac{4\pi^2}{2E/m} = \frac{4\pi^2 a}{GM}$ and $\rightarrow \frac{T^2}{a^3} = \frac{4\pi^2}{GM} = \mathbf{k}$

and $\mathbf{k} = \frac{1}{f^2_n.a^3}$ , from which issues $\rightarrow \mathbf{1 = k.f^2_n.a^3}$ and , $k = \frac{4\pi^2}{GM}$ where

Is seen that , **Resonance between Focus-Planet** exists through Space **a** and Energy **f** . **From the** Second-order differential equation excited by a Harmonic external force ,

$F_t$ .sin wt , and is as , $m\frac{d^2x}{dt^2} + c\frac{dx}{dt} + k.x = F_t$ . sin w t , corresponds Physically to the free damped vibration , where x = the displacement , dx / dt = the velocity and , d²x / dt² = the acceleration of monad , m ,c ,k constants , with the general solution given by the equation $x = A.e^{s1.t} + B.e^{s2.t} + X \sin(wt-\varphi)$ ……(1)

The Equation $\rightarrow L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + \frac{1}{c}q = E_t$ . sin wt .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 d²q / dt² = the Space distribution of charge , and L , R , C Inductance , Resistance , Elasticity constants with general solution given by the equation

$q = A.e^{s1.t} + B.e^{s2.t} + X \sin(wt-\varphi)$ …...(2)

Equations (1) , (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 Energy-Space*** cosmos .Distributed forces $L_1 - L_2 = L (di/dt)$ , $R_1 - R_2 = R.i$ , $C_1 - C_2 = q/C$ respectively , showing the **Identification** of the **Mechanical** and **Physical laws** .

The way that ***Potential-Energy is stored*** , is that of **Material - LRC- Circuit** , which is for the Gravitational-Potential-Energy the ***Material-Capacitor*** or the → ***Focus-Planet–Sector – Stores-Change*** ← which develop a Voltage in response to that charge .The coil of wire is the infinite **Stationary-Dipole-Spinning Material-Points** of this → ***Focus – Planet - Sector*** ← which develops the Back-Electromagnetic-force ,when current through them changes .

In-Cave-Box exist two motions ,***Revolving and Periodic***, the acceleration of Gravity $g \equiv \pm\, \sigma$ exists for the First Box-$B_R$ , while ***Local-Extreme-case*** for the Second Box-$B_P$ . In this Gravity $\mathbf{g} \equiv \pm\, \boldsymbol{\sigma}$ , is Locally altering **S** , by changing the Principal-stress $\boldsymbol{\sigma}$ with Local uniform Pressure $\mathbf{g_L} \equiv g\, k_E = g *$ [Force/Area] = G , i.e. is Proved that the minimum Local-Energy acceleration is the known ***Universal Gravitational-constant*** $G = g\, k = \mathbf{k_E}\, g = \mathbf{k_L}\, \sigma = g\, g_L\, k_L$ such for *Macrocosm as for Microcosm* , and both cases Obeying Newton`s Laws of motion .

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

**6c4.. The Conservation of Energy in → velocity $\bar{c}$ and in gravity $\bar{g}$ Caves ←**

Since **Gravity- $\bar{g}$** is the **Energy** ≡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 → **Position** $x = A.\sin wt$ and **Acceleration** $\ddot{x} = A\, w^2$ ← where the Signal-Spectrum is consisted of the Amplitude $\mathbf{A}_c$ and of the Angular frequency $\bar{\mathbf{w}}$ , from where all other Properties follow. Since $\ddot{x}$ ts the **acceleration Force** of Position **x** , then for Planck`s length issues $\ddot{x} = G = A^2{}_G.w^2$, or $\overline{w} = \sqrt{G/A^2} = \sqrt{6{,}68.\,10^{-11}/[2{,}6262.\,10^{-35}]^2}$ so Gravity-frequency→ $\overline{w} = 0{,}5057.10^{30}$ H and Gravity-Wave-frequency $f_{GW} = 8{,}05.10^{28}$ H ←

<u>THE GRAVITATIONAL FORCE ACTION</u> **:** $[[G]] \rightarrow \{[\bar{c}] \pm E_n\} \equiv \bar{g} \equiv E_n + \{[G] \pm [\bar{c}]\}$

and → $\mathbf{E_R = E_G + E\, \bar{c}}$ ← where ,

[[G]] = [Gravitational Constant G] ≡ The Signalling.**(W c)** → **The Carrier - Wave**

$[[\bar{c}]]$ = Any Action of [G - ON-$\bar{v}$] ≡ Any Signalling.$(\bar{v})$ **Modulating Velocity-Wave**

$[[\bar{g}]]$ = The **New Modulated** [G ↔ $\bar{v}$] Signal ≡ $f\frac{\bar{v}\, m + wc}{2}$ + $f\frac{\bar{v}\, m - wc}{2}$ ≡ [MAS]

COMPOUND = The **D**emodulated [MAS] ≡ $f\frac{w + 2wc}{2}$ + $f\frac{w - 2wc}{2}$ ≡ [DMAS] . $\bar{v}$ , since

**[ G = The CARRIER ]** →**[ $\bar{c}$ = The MODULATOR ]**→**[ G+$\bar{c}$ = The MODULATED ]**

and **[ G+$\bar{c}$ ] + $\bar{g}$** ↔ **[ DM** = 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 **.**

**The Conservation of Energy in Caves and in Atoms Compounds .** [106]

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

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

and where

$[[A]]$ = [Atom OR Compound] $\equiv$ The Signalling.(Wc) $\rightarrow$ **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] , $\overline{w}$ , as

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) .... $[A] \rightarrow [ \pm E_N ] \equiv [C] \equiv \equiv \equiv \pm E_n + [A]$ , , , , $[A] \equiv [C] + [ E_N ]$

[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 Still-Actions

**[ I = CARRIER ]** $\rightarrow$**[ F = MODULATOR ]**$\rightarrow$**[ I+F = MODULATED ]** $\rightarrow$

$\rightarrow$ **[ I+F ] + M** $\leftrightarrow$ **[ DM** = ANTIDOTES] = **THE DEMODULATION ]**

**The Communications** –Frequencies **In Atoms - Caves** , are their **Wave**

**Resonances which consist the Master-Keys** of all the **wave - caves** .

**6c5.. The Energy - Superflow in MFMF-PNS Space-Levels for Black-Holes Origination.**

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

**2**)- It was Prior Proved [70] 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 $J_1 . u^2 \cos \vartheta - J_3 w_3 . u + s . Q = 0$ .

This Quadratic equation has **4 - Solutions** where the Angular velocity Complex number

$$u = |\overline{w}| = \frac{s\,Q}{B} = \frac{s\,Q}{J_3 w} = |\overline{w}| = \frac{d\varphi}{dt} = [\frac{J_3 . w_3}{2\,J_1 . \cos \vartheta}] \pm [\frac{k_{PNS}}{2\,J_1 . \cos \vartheta}].i = s \pm v\,i \text{ , or}$$

$$\rightarrow \textbf{Angular-velocity } |\overline{w}| = \frac{J_3 . w_3}{2\,J_1 . \cos \vartheta} \pm \sqrt[2]{- \frac{sQ}{J_1 . \cos \vartheta} + (\frac{J_3 . w_3}{2\,J_1 . \cos \vartheta})^2} = s \pm \{\sqrt{\overline{D}}\}.i \leftarrow$$

$$\text{where } s = [\frac{J_3 . w_3}{2\,J_1 . \cos \vartheta}] \text{ , } \overline{D} = [\frac{k_{PNS}}{2\,J_1 . \cos \vartheta}] \text{ , } k_{PNS} = \sqrt[2]{[J_3 . w_3]^2 - 4 . sQ . J_1 \cos \vartheta}$$

The constant Work exists on the **common Central Axes of Rotation** which is Fixed to

the Tangential-Planes of $\overline{w}$ & $\overline{B}$ **nib** , being alternately Perpendicular to , $\overline{B}$ , and , $\overline{w}$ ,

and found to be as $\overline{B} . \overline{w} = 2L = J.w^2$ . **The frequency monad** of rotation in the **PNS**

**Space** is as $\rightarrow f_{PNS} = \frac{s\,Q}{2\pi . J_2 . w} \leftarrow$ with the following 4 - Solutions for $|\overline{w}|$ ,

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

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

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

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

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

where **BH** = Black Hole .    From  4-above issues ,

**A-Velocity** $|\overline{w_1}| = \dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta} \pm^2\sqrt{-\dfrac{sQ}{J_1.\cos\vartheta} + (\dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta})^2} \equiv \dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta} +^2\sqrt{-\dfrac{sQ}{J_1.\cos\vartheta} + (\dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta})^2}$

**A-Velocity** $|\overline{w_2}| = \dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta} \pm^2\sqrt{-\dfrac{sQ}{J_1.\cos\vartheta} + (\dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta})^2} \equiv \dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta} -^2\sqrt{-\dfrac{sQ}{J_1.\cos\vartheta} + (\dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta})^2}$

**A-Velocity** $|\overline{w_3}| = \dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta} \pm^2\sqrt{-\dfrac{sQ}{J_1.\cos\vartheta} + (\dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta})^2} \equiv \dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta} +^2\sqrt{-\dfrac{sQ}{J_1.\cos\vartheta} + (\dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta})^2}. \, i$

**A-Velocity** $|\overline{w_4}| = \dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta} \pm^2\sqrt{-\dfrac{sQ}{J_1.\cos\vartheta} + (\dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta})^2} \equiv \dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta} -^2\sqrt{-\dfrac{sQ}{J_1.\cos\vartheta} + (\dfrac{J_3 \cdot w_3}{2\,J_1.\cos\vartheta})^2}. \, i$

Angular-velocity $\overline{w}$ *is a vector* , and **Rotates** in one **axis k** with respect to variable $\overline{\mathbf{B}}$
Momentum and , **the Ellipsoid of $|\overline{w}|$ $\equiv$ Quaternion of dimension Power (s $\pm$ $\overline{v}$ ⊡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 $\overline{w}$ $\equiv$ { **Polhode** $\equiv$ Cone OPS , **Herpolhode** $\equiv$ Cone OPT , [ ↻ **Rolling** ] on the
　　　　　the **Ellipsoid axis ,** $\downarrow$ Normal ON the **Unmovable & Attitude-Plane** of
　　　　　the [ PSPT ] **Truncated-Polar-Cone** }.
$\Rightarrow$The-Imaginary $\overline{w}$ $\equiv$ {**Polhode** = Cone OPS , **Herpolhode** = Cone OPT [ ↺ **Rolling** ] on
　　　　　the **Anti-Symmetrically-Ellipsoid-axis,** $\uparrow$ Normal ON the **Unmovable**
　　　　　**& Attitude-Plane** of the [ PSPT ] **Truncated-Polar-Cone** } .
It has been Proved that $\overline{\mathbf{B}}$ **,** $\overline{w}$ **Vectors** exist as **,** **E** = Energy =motion **,** **S** = Space =Length
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　Both magnitudes define the **Unit-Energy Vectors** $\rightarrow$ { **Unit-E Vector R** $= \dfrac{\sigma}{J.w^2} = \dfrac{\sigma}{\overline{\mathbf{B}}}$ } $\leftarrow$
　**When** the **Unit-E.Vector R** is Placed ON [**AB$\equiv$2R S.Diameter** of Spaces-Neutral-circle]
　**Then Energy-Monad $|\overline{\mathbf{R}}|$** , exists on , **Space-Monad $|AB| \equiv |\overline{\mathbf{R}}|$** and **is {E+S -Monad $|\overline{\mathbf{R}}|$}**
　　　　Or is The { **Energy – Space - Monad $|\overline{\mathbf{R}}| \equiv |AB|$** } ,    where the magnitudes,
　Spaces Sides $\boldsymbol{\lambda_n} = 2,\sqrt{R^2 - a^2{}_n}$ , & the Quantum Critical-Side $\mathbf{a_n} = \dfrac{1}{2}\sqrt{4R^2 - \lambda^2{}_n}$ ,
　Every=Monad occupies AB = 2|R| Diameter = Space & Unit-E-Vector R$= \dfrac{\sigma}{J.w^2} = \dfrac{\sigma}{\overline{\mathbf{B}}}$= motion

**The Quantization** of **Energy** in **Spaces** happens by following the *Archimedes formula* for
　Duplication of Sides as $\boldsymbol{\lambda_{2n}} = \sqrt{2R^2 - R\sqrt{4R^2 - \lambda^2{}_n}}$ & Critical-Sides $\mathbf{a_{2n}} = \dfrac{1}{2}\sqrt{4R^2 - \lambda^2{}_{2n}}$

　　**The Energy-Monad $|\overline{\mathbf{R}}|$** $= \dfrac{\sigma}{J.w^2} = \dfrac{\sigma}{\overline{\mathbf{B}}}$ remains the same in **PNS - Space** while
　　**The Spaces Sides** change as $\boldsymbol{\lambda_{2n}}$ **,** $\mathbf{a_{2n}}$ , when the **Monad $|\overline{\mathbf{R}}|$** enters the 2n .
--------------------------------------------------------------------------------------------------------
　　The  4 - Solution for Real and Imaginary Root is as below ,
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 .
From Gravity relation  G = g $\mathbf{k_E}$ =9,8076941.6,8116.10$^{-12}$= 6,68056.$\mathbf{10^{-11}}$ m³/ N.s² from

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

Energy-loop relation $1 = c. r^3. f_P{}^2 \rightarrow f_P = \sqrt{1/cr^3}$ , and from $f = E / h$ then $f = \dfrac{E}{h} = \sqrt{1/cr^3}$

or $\rightarrow E = h .\sqrt{1/c. r^3}$ , and $\dfrac{E^2}{h^2} = \dfrac{1}{c\, r^3}$ or , $E^2 = \dfrac{h^2}{c\, r^3}$ , 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 their means are for ,

7) Particles　 $\rightarrow$ The Resultance of the One-Dimensional-Collision $\bar{v}_{ij} = \bar{v}_j - \bar{v}_i = \bar{w}_{ij}. \bar{r}_{ij}$

8) Particles　 $\rightarrow$ 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 $\rightarrow$ The Resonance-frequencies $f_R$ $[S \equiv f_{1= n}, f_2, f_3, f_{R=} w^2] = f_n = [\oplus \leftrightarrow \ominus]$

$\quad = n \dfrac{(1+\sqrt{5})\sigma}{4\pi r} = \dfrac{n.\sigma.\bar{B}}{8\, r^2}$ $\rightarrow$ i.e. The Golden-ratio-Pattern , which is related to Spin.

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**From Solution-3** the magnitude **D** becomes maximum when $\dfrac{sQ}{J_1.\cos \vartheta} \equiv$ maximum or ,when

$|\theta \bar{r}|$ axis is $\perp \bar{B}$ and Cone-angle $\theta \Rightarrow 90$ . From Energy relation $E = W = 2L = \bar{B} .\bar{w} = J.w^2$
**Angular-Momentum $\bar{B}$** $= [3 ,3770539.10^{-96}J].[5,613308.10^{45}Hz] = \mathbf{1,895644.10^{-50}\ J/s,}$
**i.e.** The Planck`s cave , $10^{-35}$ m , is **The Safety-Valve $\equiv$ The Critical State** for the **Stress**
　　**Ellipsoids** , $\bar{B}\ \bar{w}$ , Vectors in order that this Total-Energy to **Superflow** and be **Still** into
　　Vacuum $\equiv [10^{-62}\text{-}10^{-35}m]$. 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 $|\bar{R}| \equiv |AB|$ } , Vanishes $\equiv$ Decomposes** $\leftarrow$

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　　**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 $L_{PLA} = 6,6262.10^{-34}$ m , and $L_{GRA} = 1,777.10^{-62}$ m ,

　　From cave $L_{PLA} = 6,6262.10^{-34}$m and $f_P = \sqrt[2]{\dfrac{g}{a^3}} = \sqrt[2]{\dfrac{9,8078}{(6,6262.10^{-34})^3}} = 1,83585.10^{50}$ H

　　then $\rightarrow E_{PLA} = h.f_P = 6.62607.10^{-34} . 1,83585.10^{50} = 1,216447. 10^{17}$ J
　　The minimum Charge in Planck`s cave $\rightarrow$ $q_{PLA} = \mathbf{1Cb} = 1,6 .10^{-19}$ eV ,

　　From Voltage relation $\Delta U = \dfrac{\text{Energy}}{\text{Charge}}$ issues , $1\text{Volt} = \dfrac{1\text{Joule}}{1\text{Culomb}}$ or $\mathbf{1V = \dfrac{1J}{1C}}$ ….**(v)**

　　In order that 1Cb may overflow and **Flow from** Planck`s cave **To** the Gravity cave ,
　　then must exist a Voltage $\Delta U > = 7,593.10^{35}$ eV , and be as ....**(v)**

$$\mathbf{V_{GRA}} = \dfrac{h.f_P .}{1Cb} = \dfrac{1,216447.10^{17}\ J}{1,6022.10^{-19}\ eV} = \mathbf{7,593.10^{35}\ V} \ , \ \textbf{i.e.}$$

$\rightarrow$ When the Energy in **Planck`s cave** $L_{PLA}$ , **Increases** to an Voltage $>= 7,593.10^{35}$ 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** $[\oplus\text{-}\varnothing\text{-}\ominus]$ in Gravity Cave $L_{GRA}$.
　　**So** Energy $\equiv$ motion , exists in $L_{GRA}$ as an $\rightarrow$ **Pointy Rotational Centripetal Force** $\leftarrow$

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

→ When the Energy in **Planck`s cave** $L_{PLA}$ , **Decreases** to an Voltage $=< 7,593.10^{35}$ V

then **motion** ≡ **Energy** between the Two Opposite elements of M-P-Dipole [⊕↻↺⊖]
Creates the A-velocity-vector $\overline{w}$ which **Rotates** in the **axis k** with respect to variable $\overline{B}$.

**So** when **Unit-Energy Vectors** $\overline{R} = σ / \overline{B}$ exists on the **Unit-Space-Monad** $|AB| ≡ |\overline{R}|$ ,

Then is → {The **Energy –Space - Monad** $|\overline{R}| ≡ |AB| ≡$ **The Existing Universe**} ←
For The Chaos - Motion → **Angular – Momentum** ≡ The Rotational Energy $\overline{B}$ ←
For The PNS – Spaces → **Angular – Momentum** ≡ The Rotational Energy $\overline{Λ}$ ←

From Fig-13 and Solution-3 , magnitude **D** becomes maximum when $\dfrac{sQ}{J_1.\cos \vartheta} ≡$ **maximum**

or , when $|θ\overline{r}|$ axis is $\perp \overline{B}$ and Cone-angle $θ \Rightarrow 90$ , where Energy E =W= 2L= $\overline{B}$ .$\overline{w}$ = J.w²

**Angular-Momentum** $\overline{B}$ = [3 ,3770539.$10^{-96}$J].[1,15346.$10^{51}$Hz] = **3,895312.$10^{-45}$ J/s,**

**i.e.** The Planck`s cave , $10^{-35}$ m , is **The Safety-Valve ≡ The Critical State** for the **Stress**

**Ellipsoids** ,$\overline{B}$ $\overline{w}$, Vectors in order that this Total-Energy to **Superflow** and be **Still** into
Vacuum ≡ $[10^{-62}$-$10^{-35}$m] . This **Vacuum** between the |Gravity cave - Planck`s cave|
CONSISTS The **BLACK - HOLES - CHAOS** , as the Recycling–Energy into which
→ The { **Energy – Space - Monad** $|\overline{R}| ≡ |AB|$ } , **Decomposes** ← {Fig-13}

IN FIGURE , THE HERPOLHODE- CONE PLANE IS A CIRCLE WHERE VECTOR $\overline{B}$

ROTATES , AND WHEN $θ \Rightarrow 90$ . **THEN CONE BECOMES** A CIRCLE , where

Energy follows [ ⊕ ∅ ⊖ ] mode as → + when $θ = 0 = < 90$ , and - when $θ = 90 – 180$ ←

**It was shown** that , the **Energy from Chaos** [⊕ - ∅ - ⊖ becomes **Momentum** $\overline{w}$ , $\overline{B}$ ,

and is **Composed** ≡ Quantized through the **Physical-[STPL]-line-Mechanism** , In-circle

$\Rightarrow$ Triangles $\Rightarrow$ Ex-circle $\Rightarrow$ Ex-Triangles consisted with the three Spaces . **On** this **PM**

exist the Three Breakages [**s² = ⊕ , 2s ² = ∅ , - s ² = ⊖**] which **Circularly-Charge** ON

the **Three – Extreme - Triangles** {A B C} , {$K_A$ $K_B$ $K_C$}, {$A_E$ $B_E$ $C_E$} and thus **launch**

The Energy-Quantity $\pm$ **$Q_{p-p}$**= $[\dfrac{c.S}{r}]$ ≡ **Centripetal-Force** from Chaos to PNS Space **,**

On the **Pascal`s -Desargues** Points-Line through the STPL **Circuit** caves **r** , and from

the **Ptolemy`s & Ceba`s** Still-mechanism . {Fig-24}

  **Remark .**

1.. **Electron , e** , $m_e$ = 0 , 511MeV = 0, 511.$10^{-6}$ eV . [1,80. $10^{-27}$] = 9,198.$10^{-34}$ Kg
$a_e$ = 5,0.$10^{-18}$ m ,Charge **$C_e$** =1,602.$10^{-19}$ C , Spin $S_e = \dfrac{S}{2}$ =2,845976.$10^{-34}$ {Kg/m/s},
Using **$E_{eK}$** $= \dfrac{k}{r} + \dfrac{cS^2}{2m.r^2} = \dfrac{36.10^{-20}}{7,10^{-18}} + \dfrac{3.10^8(5,691952.10^{-34})^2}{2.9,198.10^{-34}[5.10^{-18}]^2}$ = 51,428 eV + 2,111843.$10^{10}$J
= 51,43 eV+ 1,32 .$10^{29}$ eV , **i.e.** The Energy Increases inverse analogous to the cave .
2…Since Primary motion ≡ [PM] exist from the Three Breakages only **STPL** is the **n** =3
Mechanism creating Elementary Particles as [**n-Knots**=3] in **V** $_{GRA}$ = 7,593.$10^{35}$ **V** .

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

The Unit-**Space -Vectors ,** $\overline{B}.\overline{w}$ , & The Unit-**Energy-Vectors ,** $\overline{B}.\overline{w}$ , **Ellipsoids** .
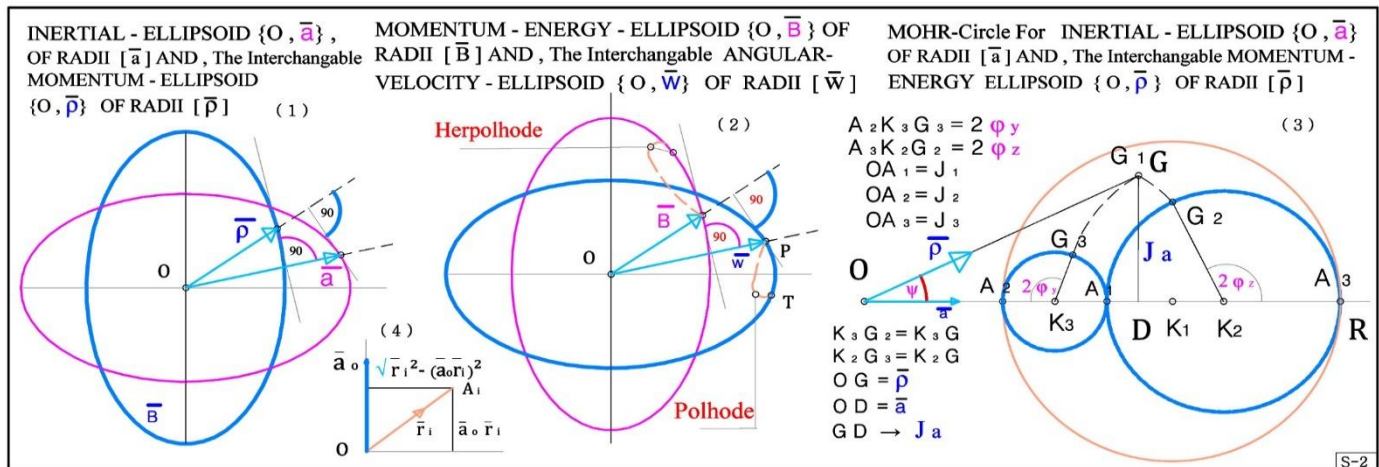


**Figure.17c .**. Shown the Geometrical-meaning of $\overline{a_o}\,\overline{r_i}$ , $\sqrt{r_i{}^2 - (\overline{a_o}\,\overline{r_i})^2}$ terms of radius OA $_i$

> In (1) is shown the ***Inertial - Ellipsoid*** ( O, $\overline{a}$) of Radii , $\overline{a}$, and the Interchangable
> **Momentum–Ellipsoid** (O , $\overline{\rho}$) of Radii , $\overline{\rho}$. (O , $\overline{\rho}$) . The same for {$\overline{B}$ , (O, $\overline{B}$)}
> In (2) is shown the ***Momentum - Energy - Ellipsoid*** ( O, $\overline{B}$) of Radii , $\overline{B}$, and
> the Interchangable Angular Velocity – Ellipsoid (O , $\overline{w}$) of Radii , $\overline{w}$ . **S** = Space
> In (3) is shown in Mohr-method , the Geometrical construction from the two
> Interchangable Ellipsoids→*The Energy-Rotational Momentum–Ellipsoid* ( O , $\overline{\rho}$) , where
> { ***Work*** } = The Angular-Velocity-vector -Unit-sphere , S =*The Inertial- Ellipsoid* (O , $\overline{a}$) ,
> { ***Force*** }= The reaction to the velocity-change-motion , S = *The Mass - Ellipsoid*
> { ***Mass*** } = ( GD = J$_a$ ≡ $\overline{M}$ ) , and Between the Types of Ellipsoids issues $\overline{\rho}$ . $\overline{a}$ = J $_a$ ..(12)

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

**Conclusions** :

**1..From** the generated Radius $\overline{a}$ =*The INERTIAL-Ellipsoid* of a Solid Fig-17-1 corresponds
another Radius $\overline{B}$ , Fig-17-2 ***Momentum –ENERGY– Ellipsoid*** , to the Common-Point O of
Rotation .The Radius $\overline{B}$ is Perpendicular to the Tangential-Plane at the Nib of the $\overline{w}$ Angular
Velocity-Ellipsoid . Similarly the Radius $\overline{B}$ is Perpendicular to the Tangential-Plane at the
Nib of the $\overline{B}$ of the Angular-Momentum-Ellipsoid . Relation $\overline{\rho}$ . $\overline{a}$ = J $_a$= a constant , means
$\overline{\rho} \perp \overline{a} \equiv$ **Space + Anti-Space** $\equiv$ **motion** $\Rightarrow \overline{w} \equiv [ i \equiv {}^2\sqrt{-1} ] * \overline{\rho} \equiv$ The Argand-Diagram.
**From** relation (12) , the vertical-Projection of the radius , $\overline{\rho}$ , at the corresponding conjugate
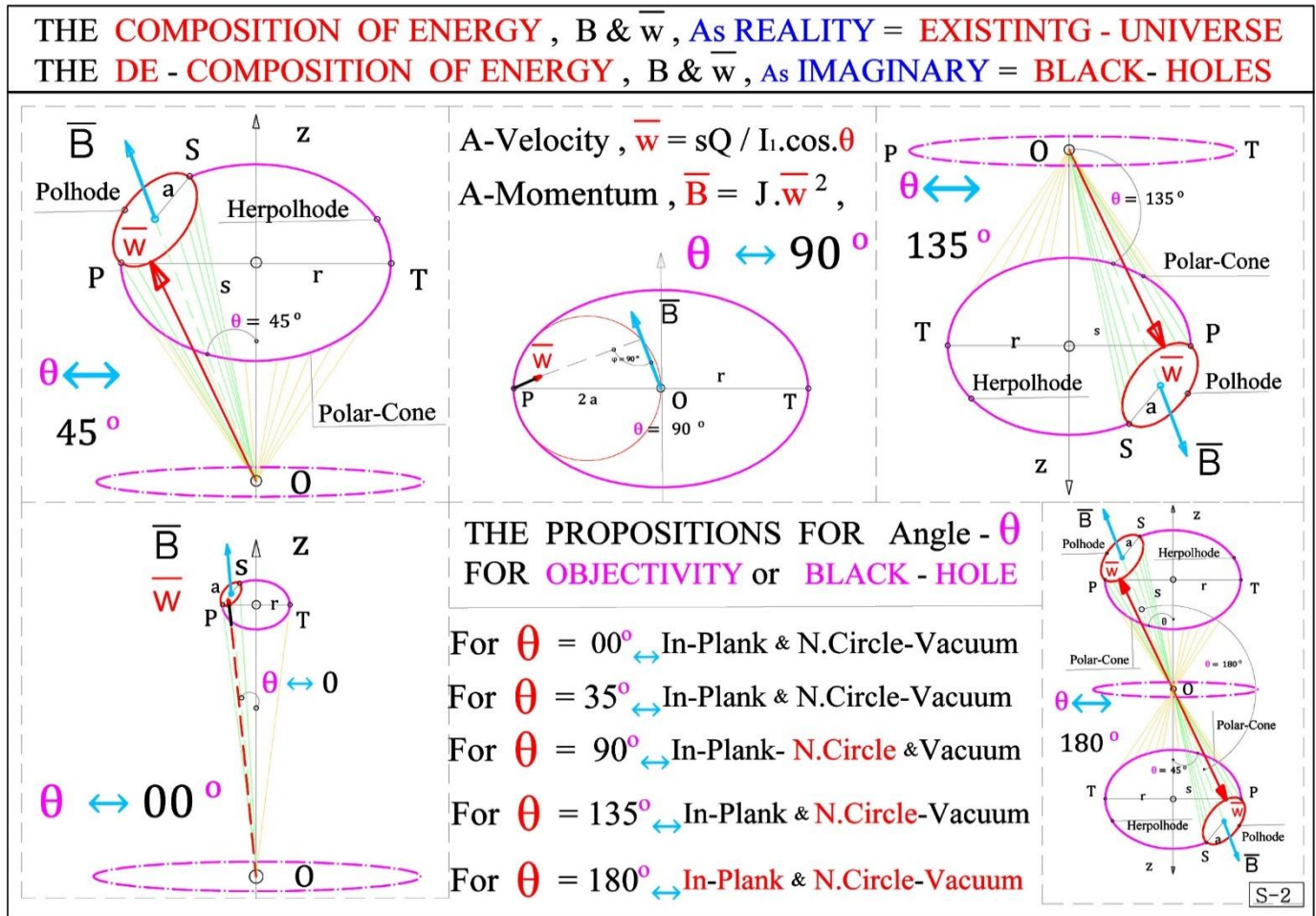radius $\overline{a}$ , of the Unit Sphere , denotes the meter to the Solid last Angular momentum .
**Because** the **Unit-Energy-Vectors** , $\overline{B}.\overline{w}$ , are related as $\overline{R} = AB = \sigma / \overline{B} = \sigma / J.w^2$ , **i.e.** the
common velocity vector $c = w\,r = 2.B / \pi\,r^3$ , therefore **issues and for all the 5-Spaces** .
**2..Inversely** The Unit-Energy-Vectors , $\overline{B}.\overline{w}$ , Decompose when $B_{crit} = J\,w = \frac{\pi r^3}{2}[c/r] = [\frac{\pi r^2}{2}]c$

**Or** when $\overline{w}$ becomes maximum , **i.e.** for **Gravity and Antigravity** happens when $|\theta\overline{r}|$ axis is
Perpendicular ($\perp$) to $\overline{B}$ and the Cone-angle $\theta \Rightarrow 90$ , **and** Energy E =W= 2L= $\overline{B}$ .$\overline{w}$ = J.w².
From the $\overline{c}$ Physical -Magnet , $\overline{w}$ is **Quantized** to the 2-Constitutes $\oplus \Rightarrow \ominus$ as the Prior .

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**6c6.. The De-Quantization of Energy from , PNS $\Rightarrow$ MFMF , $\equiv$ Empty Space .**



**Figure.17d..** The **Angular-velocity** $|\overline{w}| = \frac{J_3 . w_3}{2 J_1 . \cos \vartheta} \pm^2 \sqrt{- \frac{sQ}{J_1 . \cos \vartheta} + (\frac{J_3 . w_3}{2 J_1 . \cos \vartheta})^2} = s \pm \{\sqrt{\overline{D}}\} . i$

$\Rightarrow |w_3| = [s] + [\sqrt{\overline{D}}] . i$ , $s = [\frac{J_3 . w_3}{2 J_1 . \cos \vartheta}]$ , $\overline{D} = [\frac{k_{PNS}}{2 J_1 . \cos \vartheta}]$ , $k_{PNS} = {}^2\sqrt{[J_3 . w_3]^2 - 4 . sQ . J_1 \cos \vartheta}$

From 10.c, the Unit-Energy-Vectors , $\overline{B} . \overline{w}$ , $f_P = 1,836 . 10^{45}$Hz in PNS–Space become

**1)..** From relation $\overline{w} = 2\pi . f_{PNS}$ , then $w_{PNS} = 56,13308 . 10^{44}$Hz = $5,613308 . 10^{45}$Hz ,

**2)..** From Centripetal Force in **MFMF Space** $F_C = \sigma = \frac{m.v^3}{r} = J w^2 r = \overline{B} w r$ , then $\overline{B} = J w$ ,or

$\overline{B} = J w = [\frac{\pi . r^4}{2}] . w = \frac{\pi [1,6162 . 10^{-35}]^4 (5,613308 . 10^{45})}{2} = 3,3770539 . 10^{-96}$ J and for eV ,

$\overline{B} = 3,3770539 . 10^{-96}$ J / $1,6022 . 10^{-19}$ C = $3,754935 . 10^{-76}$ eV.

**3).. From Sol -3** the magnitude **D** becomes maximum when $\frac{sQ}{J_1 . \cos \vartheta} \equiv$ maximum or , when

$|\theta \overline{r}|$ axis $\perp \overline{B}$ and Cone-angle $\theta \Rightarrow 90$ . From Energy relation $E = W = 2L = \overline{B} . \overline{w} = J . w^2$

**Angular-Momentum $\overline{B}$** = $[3,3770539 . 10^{-96}$J] . $[5,613308 . 10^{45}$Hz] = **1,895644 . 10^{-50} J/s,**

**i.e.** The Planck`s cave , $10^{-35}$ m , is **The Safety-Valve $\equiv$ The Critical State** for the **Stress**

**Ellipsoids** , $\overline{B} \overline{w}$, Vectors in order that this Total-Energy to **Superflow** and be **Still** into Vacuum $\equiv [10^{-62} - 10^{-35}$m]. This **Vacuum** between the |Gravity cave - Planck`s cave|

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

CONSISTS the BLACK - HOLES - CHAOS , as the Recycling–Energy , into which

→ **The { Energy – Space - Monad |$\bar{R}$| ≡ |AB| } , Vanishes ≡ Decomposes ←**

→ **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 $L_{PLA} = 6,6262.10^{-34}$ m , and $L_{GRA} = 1,777.10^{-62}$ m , The Total Energy in Planck`s cave is → $E_{PLA} = 1,216447.10^{17}$ J , and The minimum Charge in Planck`s cave → $q_{PLA} = $ **1Cb** $= 1,6.10^{-19}$ eV ,

From Voltage relation $\Delta U = \frac{Energy}{Charge}$ issues , $1 Volt = \frac{1-Joule}{1-Culomb}$ or **$1V = \frac{1J}{1C}$** ….**(v)**

In order that 1Cb may **Overflow and Flow** from Planck`s cave **To** the Gravity cave , then must exist a Voltage $\Delta U >= 7,592354.10^{35}$ eV , and be as ……**(v)**

$$V_{GRA} = \frac{h.f_P.}{1Cb} = \frac{1,216447.10^{17} J}{1,6022.10^{-19} eV} = \textbf{7,593.10}^{35} \textbf{V} \ , \ \textbf{i.e.}$$

⇒ When the Energy in **Planck`s cave** $= L_{PLA}$ , **Increases** to an Voltage $= 7,593.10^{35}$ V then the **motion≡ Energy** between the Two Opposite elements of MP-Dipole [⊕↔⊖] Becomes a **Stationary Flow** [⊕,⊖] ≡ **Charges** [⊕ - ∅ - ⊖] in Gravity Cave $L_{GRA}$ . **So** Energy ≡ motion , exists in $L_{GRA}$ as an → **Pointy Rotational Centripetal Force ←**

⇒ When the Energy in **Planck`s cave** $L_{PLA}$ , **Increases** to an Voltage $V_{CR} > 7,593.10^{35}$ V then **motion ≡ ⇄ ≡ Energy** between the Two Opposite elements of M-P-Dipole [⊕↺↻⊖] Creates the Negative-Angular -velocity-vector $\bar{w} \downarrow$ , which **Rotates** in the Symmetrical to Neutral circle **axis k = ↓** with respect to the Interchangable variable $\bar{B} \downarrow$ . This is the Case of The Black-Holes - Origination .

⇒ When the Energy in **Planck`s cave** $L_{PLA}$ , **Decreases** to an Voltage $= < 3,695.10^{30}$ V then **motion ≡ ⇄ ≡ Energy** between the Two Opposite elements of M-P-Dipole [⊕↺↻⊖] Creates the Positive-Angular -velocity-vector $\bar{w} \uparrow$ , which **Rotates** in the Symmetrical to Neutral circle **axis k = ↑** with respect to the Interchangable variable $\bar{B} \uparrow$ . This is the Case of The Universe - Origination . **So thus** , are defined the **Unit-Energy - Vectors** , $\bar{R} = σ / \bar{B} = σ / J.w^2$ , which Exist ON the **Unit – Space – Monad |AB| ≡ |$\bar{R}$|** , and which is { **The Energy – Space – Monad |$\bar{R}$| ≡ |AB| ≡ The Existing Universe** }.

In Fig-14 are shown the 5-States for angle → $θ ⇒ 0^e , 45^e , 90^e , 135^e , 180^e$ .
**1..** For angle → $θ ⇒ 00^e$ , $\bar{w} ≡ \bar{B}$ , Voltage $= 7,593.10^{35}$ V , ↑ On Neutral – Circle
**2..** For angle → $θ ⇒ 45^e$ , $\bar{w} / \bar{B}$ , Voltage $< 7,593.10^{35}$ V , < ≠ Neutral – Circle
**3..** For angle → $θ ⇒ 90^e$ , $\bar{w} ⊥ \bar{B}$ , Voltage $≡ 7,593.10^{35}$ V , ⇄ In Neutral - Circle
**4..** For angle → $θ ⇒ 135^e$ , $\bar{w} \setminus \bar{B}$ , Voltage $> 7,593.10^{35}$ V , ≠ > Neutral – Circle
**5..** For angle → $θ ⇒ 180^e$ , $\bar{w} ⊥ \bar{B}$ , Voltage $>= 7,593.10^{35}$ V , ↑↓ Off Neutral-Circle

**4).. From Solution-4** , The {Energy-Space-Monad |$\bar{R}$| ≡ |AB|} **Vanishes** in **BH-Chaos** , where Energy **Increases** to an Voltage $>> 7,593.10^{35}$ V and then **motion ≡ Energy** between the Two Opposite elements **collides them** to the MP-Dipole [⊕↔⊖].

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**5)..** **From Solution-5** , The {Energy-Space-Monad $|\overline{R}| \equiv |AB|$} **Vanishes** in **BH-Chaos** ,

& Energy is **Quantized** to the 2-Constitutes from the $\overline{c}$ , Physical-Magnet $\oplus \rightrightarrows \ominus$.
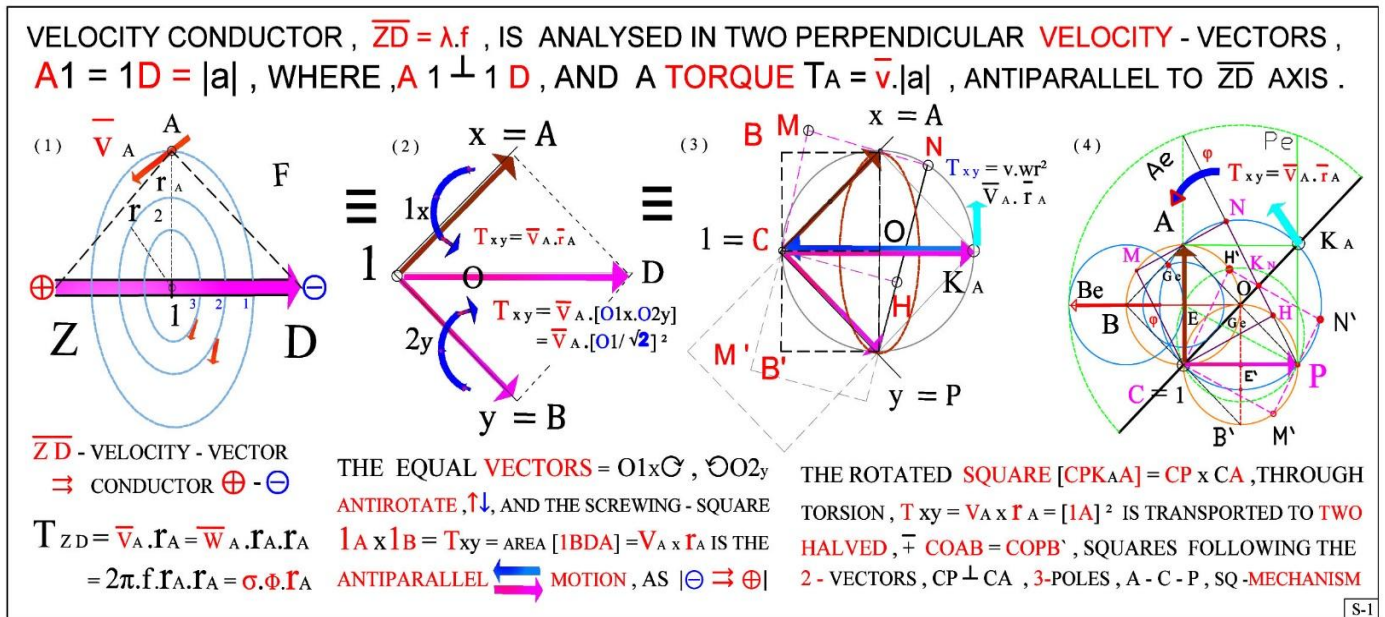


**Figure.17e.**.**The Stability** of **Photon** as Electromagnetic Wave with the Two frequencies .
The Dual Property of The **Simultaneous existence** as Electric and as Magnetic Fields
in wavelengths , $\lambda_x$ , $\lambda_y$ , as **Effective Range** .which is thrusted through the Newton's
Gravitational Force G only , becoming from the *Trigonometry relations* [The Space ] ,
$\sin(2\varphi) = \sin(\pi - 2\varphi) = \sin(\frac{\pi}{2} - \varphi)$ , and from *Physics* [Energy] $E_x = g$ ,

**Maxwel Electric Displacement current $\vartheta D / \vartheta t$ is created from the ( $c_x$ , $c_y$ ) Vectors
motion happening from gravity continuous action , and Producing the Work $W = c_y\, g$
For Photon {** Markos Rotating Method of{ **2-Vectors 3-Poles Mechanism** }which Circles
and Squares as Areas Pass from the Point **M** determined by the Position **A$_e$** , and where is
such that issues $\pi r^2 = $ CMNH Square then .**The Squaring of the circle** becomes at the

**equilibrium - Positions** which are from relation $\rightarrow \pi [\frac{CA}{\sqrt{2}}]^2 = CM^2 = |CM`|^2 \leftarrow$ namely

The square | CMNH | = square | CM`N`H`| . **Because of the Bellow motion then ,**
The Total motion in the Wavelength , $\lambda$ , corresponds to the angle a = 45 °, 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 Conjugate Magnetic-field-area* . The common axis of the two Perpendicular

fields , carry the Golden-Ratio *Energy-Surfaces* , and Runs with the same velocity $\overline{c}$

to the direction of the inner motion .

**The EPILOGUS in** [89 - 96]

IT WAS PROVED and ELUCIDATED THAT ,

**a..** Monad is Quaternion [x + i y] = $\overline{\lambda}$ type , and its Energy is Vector as $\vec{Q} = \{\lambda\}.X$ , where
X = The Displacement . Since $1 = c. r^3. f_P^2 = $ constant , so $\rightarrow r^3. f_P^2 = $ constant . Since also

$\lambda = 2r$ then $r^3 . f_P{}^2 = \lambda^3 . f_P{}^2 = c$ , and Energy becomes $\rightarrow$ Vector $\vec{Q} = \{\lambda\}.\sqrt[3]{c/ f_P{}^2} \leftarrow$ [$E_1$]

**b..** In Mechanics an **Energy-Vector** is an **Conductor** $\overrightarrow{AK_A} = |\vec{Q}|_{\pm}$ , and is The Quaternion in Material-Geometry where **Zero-Point** $0 \equiv \varnothing \equiv \{\oplus+\ominus\}$ on where motion $|\vec{Q}|_{\pm} \equiv \overline{Q}_x$ as an Electric field on $AK_A$ axis and as $\vec{Q}|_{\pm} \equiv \overline{Q}_y \equiv$ Magnetic field $\perp AK_A$ , is Transferred from One Edge Point A , to the Other Edge Point $K_A$ as $\rightarrow \overline{Q}$ , $\overline{Q}_x$ , $\overline{Q}_y \leftarrow$ [$E_2$]

**c..** Energy is the Work , The motion , Produced in Energy-monads and for Photon is Equal to $W = 2L = \overline{B} . \overline{w} = r\,m\,v = [r.\,p] = J\,w^2 \equiv [\,\overline{k}_x \perp \overline{k}_y\,]$ where $\overline{k}_x = \overline{k}_y$ , in the Conductor $\overrightarrow{AK_A} = 2.r \equiv \lambda$ where , $\lambda$ Is -The -Wavelength and $p = m\,c =$ The Momentum . [$E_3$]

**d..** It was Prooved That $\rightarrow$ Any **Diameter D** of a circle in the **STPL – Circuit ,** the **Three –**

**Poles –Squares-Rotational - System** is an **Conductor** where $D = \overrightarrow{AK_A} = |\vec{Q}|_{\pm} = |\frac{c.\overrightarrow{S}}{r^2}| = I_E$

The - **Electric**-Wave-Intensity , **And** $\overrightarrow{A \uparrow K_A} \equiv I_M$ is The - **Magnetic**–Wave Intensity.

Their **Square -Vectors – Area** $= [\overrightarrow{AK_A}]x[\overrightarrow{A \uparrow K_A}] = [\overline{Q}_x \overline{Q}_y] =$ The **Energy - Square**

$\equiv$ **CM** x **CM** = **CMNH** square = on circle ( E , EA ) , and from relation $\overline{v} = \sigma . \Phi = \frac{F}{A} \Phi$

area A = F / $\sigma$ = |CM|² / $\sigma$ , **i.e. Plane-force** F = $\sigma$ . |CM|² , and in Space **Volume-Force**

$F = \sigma . |CM|^3 \equiv$ [$E_4$] or $[\overrightarrow{AK_A}]x[\overrightarrow{A \uparrow K_A}]x[D] = $ **CMNH** x $\overrightarrow{Q \,\substack{\nwarrow\\\rightrightarrows}} = $ **CMNH** x $\overline{Q}_{\substack{\nwarrow\\\rightrightarrows}}$ ,

**where** $|\overrightarrow{Q \,\substack{\nwarrow\\\rightrightarrows}}| \equiv \vec{q}$ **,** which is the Energy-Quantum In The Propagating Electromagnetic Wave where $| I_E \perp I_M |$ **.** Since motions $\overline{B}x\overline{w}$ , are Constants from (b) and from Poinsot`s solution $w_1{}^2 + J_2\,w_2{}^2 = a^2$ , then Angular velocity-Ellipsoid Polar-Paths are the **Parallel circles** and Perpendicular to the Angular-Momentum Ellipsoid Nibs.. [$E_5$] , [70]

**e..** When is found **an Obstacle at Point $K_A$ ,** Then The Particles of Conductor medium **Oscillate** Perpendicular . This Obstacle at $K_A$ Point , is The Presentation of the , $\oplus$ constituent and the Absent of $\ominus$ constituent **and so** $\pm$ , Transverse- Propagating-Wave , Or moving Energy-Vector $|\oplus Q \Uparrow_{\overrightarrow{AK_A}}| = |\updownarrow|$ at Node $K_A$ **Is Equal** to E-Vector$| \oplus Q \rightrightarrows_{\overrightarrow{AK_A}} | \equiv |\leftrightarrow|$ at Node A **, and** Energy Volume is Doubled as , $2L = \overline{B} .\overline{w}$ , in $\overline{K_A A}$ Conductor meaning that **the meter of Volume is the Duplication of Total Energy L** .The Reaction to the motion of Squares $\{|Q_{X=CO} \rightrightarrows| x|Q_{y=CB} \Uparrow|\} \equiv |\overrightarrow{Q \,\substack{\nwarrow\\\rightrightarrows}}| \equiv [\frac{c\overrightarrow{S}}{r^2}].|\overrightarrow{Q \rightrightarrows}|$ is equal to Quantum $\vec{q}$ . [$E_6$]

**f..** Any Two Perpendicular **Energy-Vectors** , $|Q \rightrightarrows_{\overrightarrow{AK_A}} = \leftrightarrow|$ , $|Q \Uparrow_{\overrightarrow{AK_A}} = \updownarrow|$ of this Propagating Energy **,** FORM The **Energy-Square** , $|\leftrightarrow|.|\updownarrow| \equiv |Q \rightrightarrows|.|Q \Uparrow| \equiv q_0$ , on Conductor $AK_A$ and **Then** Energy-Circular-Prism $= |AK_A| .\{Q \rightrightarrows_{\overrightarrow{AK_A}}\}.\{Q \Uparrow_{\overrightarrow{AK_A}}\} \equiv$ $\equiv [\overline{Q}_x \overline{Q}_y].|AK_A| = |\leftrightarrow|.|\updownarrow|.|AK_A|$ , **i.e. An Energy-Circular-Cone** which is a Moving Energy -Volume and **Because** from Cauchy equations of Stresses in three Dimensions , **The Energy Stress** remains Flat ONLY- WHEN the Plane-Section is a circle [$E_2$] and The Square becomes circle ,*Anti-Quadrature*. Because from Mechanics , The **Sphere** occupies The **Least-Resistance** to motion where the Geometrical **Square–Cone** [CM x CH x[$\overrightarrow{CO}$ ↑]

96

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

is altered to **Equivalent Energy- Circular - Cone** $[\pi.[\frac{CM}{2}]^2$ (x) $[\overrightarrow{CO} \uparrow]$ **and**

To the **Energy Unit -Volume CO³.[$\overrightarrow{Q \rightrightarrows}$]** $\equiv$ **2 .Sphere** $\frac{4\pi}{3}$ **r³** And To **Energy-Sphere Cone** $\mathbb{C} = k\,\pi\,r^3$ , where The **Geometry- Cube** $[||\leftrightarrow|.|\updownarrow|.|AK_A|] = x^3$ so becomes The **Energy -Sphere – Cone** as $\rightarrow k\,\pi\,r^3 = x^3 \leftarrow$ **[E ₇]**

**g..** Since Frequencies $f_n$ are **The Quantum of Energy** , and Electromagnetic Vectors are always Perpendicular between them as $|\, F_E \perp F_M\,|$ , so are everywhere in nature from microcosm to macrocosm . Because Gravitational Force exists Beyond Planck`s length therefore the **Propagating-Plane-force** $F_P = \sigma . |CM|^2$ , is continually Perpendicular to the two Perpendicular constituents of Electromagnetic Vectors as $|F_P \perp F_E \perp F_M\,|$.

**Distance** is the *Quantum of E-Geometry* , while **Material-Point** is the **Quantum** in **Physics** and in **Material – Geometry** which is the composition of Opposites and are The Elements in **Chemistry and Physics .**
**As in Algebra** Zero ,0, is the **Master-key** number for all Positive and Negative numbers because their Sum and multiplication is Zero , *and the same* on coordinate - System , $\pm$ , axes pass from zero **. [E ₈]**
The Rolling of Positive $\oplus$ , constituent on the Negative $\ominus$ , constituent , creates the Neutral Material Point which Equilibrium **. Spin $\overline{B}$** , is Its Angular momentum and also the **First -Discrete-Energy-monad** which occupies *Discrete-Value and Direction* , in contradiction to the Point which is nothing , *Dimensionless* and *without any Direction* **.** Point-caves Are the Energy-Magnets from which the Quantum of Energy are Generated **.**

**h..** The **Space** is **Quantized as Energy-Caves** under the effect of Gravitational-force G , as well in **Conductors** and this **Energy or motion is Quantized as Frequency** in **Energy-Caves** , Or in **Conductors** , following the **Kepler`s First-law of Equal Areas** where in equal intervals and in Conductors , is the Electricity or Electromagnetic - Waves **. [E ₉]**
**Quaternion** $[(+)\cup\cup(-)]$ **is a Quantum-Mould** for Space $[(+)(-)]$ and Energy $\equiv$ motion $\equiv$ Force x Displacement as $[\cup\cup$ or $\uparrow\leftrightarrow\downarrow] \equiv$ Standing Box $B_Q \equiv$ An Material Point which carries the Principal Stress $\sigma$ between Positions A $(+)$ , B $(-)$ , and $\sigma$ , is the *Centripetal - acceleration* of minimum Energy becoming from the in-Storage AB acceleration and which is **equal to the** *Gravity* **g . From Quaternion** Quantum Mould $[r + \overline{v}\,\text{②i}\,]^{1/w} = e^{-\,i.(\pi/2+2k\pi).w}$ is created the **min-Space $\equiv$ cave r = 1, 07.10⁻⁷** m and the **min-Energy $\equiv \overline{v}$** = w r = $2\pi r\,f$ , as frequency $f_m$= **2,839844 . 10¹⁰** H . **G** Pushes the $\rightarrow$ min-**Quantum-Energy** $\equiv$ motion $\sigma_E$ , into the Inscribed-Cave $\pi.[\frac{CM}{2}]^2 \equiv \pi.EA^2$ . Gravitational-force **G** effecting on light velocity $\overline{c}$ creates the Electron-charge $\overline{q}$ and Electron $\overline{e}$ , while acting on Planck`s-cave on the Gravity $g \equiv \pm \sigma$ , as $G = g\,k = k_E\,g = k_L\,\sigma = g.g_L\,k_L$ , and $\overline{c}$ effecting on the min-Planck-cave in $L_P$ formulates Hydrogen-cave **H** with its electron as $H_e$ . **[E ₁₀]** , [109]

**i..** The Physical-Notion of The Duplication of the Cube , in The Quadrature Physical Energy Mould **Shows** that Nature follows the Geometry-Rules in Order to Exist as Space and as Energy , which is motion of The ,+, Constituent to The , - , Constituent **.** This motion is conserved by Propagating in caves either for Standing $\equiv |\frac{v}{\pi^2.r^4_n}|.|\overline{B}_n|$ or for moving caves as this is the Duality-Photon $\rightarrow \overline{v}$ . $[\,|\overline{f}_n| + f_n\,] \equiv |\frac{v}{\pi^2.r^4_n}|.|\overline{B}_n| + |\,\overline{c}\,|\,f_n$ .**Material-Geometry** meters for **Quantum-length** is the Quaternion $\equiv$ Dipole $\equiv$ The Two-Points joint with motion between them ,while for The **Quantum-Surface** is The Unit circle $\pi.r^2 = \pi$ , and is r =Unit 1.

97
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

For the **Quantum-Volumes** , is the. Unit Volume Sphere $\frac{4}{3}\pi.r^3 = [\frac{4.r}{3}](\pi.r^2) = \frac{4\pi}{3}$ , for r = Unit 1 . The Unit-Volume is formulated from The Inscribed-Square of Unit Circle-Side CO = CB = $1/\sqrt{2}$ , and when Placed The-Unit-Energy-magnitude OC on Square CO x CO then is Unit-Volume [CO x CO x $\overrightarrow{CO}$ ↑] . This Unit-Volume when Placed in , **The Three -Poles - Squares-Rotating-System** ,Then at Point $K_N$ , Unit Volume [CO x CO x [$\overrightarrow{CO}$ ↑] becomes [CM x CH ] x $\overrightarrow{CH}$ ↑] = Circular-Cone [$\pi.(\frac{CB}{\sqrt{2}})^2$] . [$\overrightarrow{CO}$ ↑] = **Unit - Sphere** $\frac{4\pi}{3}r^3$ , Equal to **Quantum** of Energy **.** Because Physical-Magnet $\oplus \rightrightarrows \ominus$ compels Force $\overline{Q} \rightrightarrows \overrightarrow{AK_A}$ , Between A and $K_A$ Points and Then **Unit-Sphere** $\frac{4\pi}{3}r^3$ becomes The **Double - Unit-Sphere** $2.\{\frac{4\pi}{3}r^3\}$ and because the Energy Square [$CAK_AP$] is Double that the Unit Square |CB x CO| , then Force $\overline{Q} \rightrightarrows \overrightarrow{AK_A}$ is **The Pivot** of Spinning indicating $\pm \overline{B} \equiv \overline{S}$ , in all Energy monads .[**E $_{11}$**]

**j..** **Gravity** and **Antigravity** are the two **Halve - Spins** from the Angular Momentum $\overline{B} \equiv \pm$ **Work** created from the velocity vector $\overline{c}$ by Rotating ↻ on Planck`s Cave Diameter.[**E$_{12}$**]
**This Property , $\pm \overline{B} \equiv \overline{S}$ , is in all Energy monads** and when **Applied on Initial , $\oplus \rightrightarrows \ominus$ , Answers to the 3D-Stability** of All **Elementary-Particles** and **Cosmology Equilibrium .**
**Gravity + g ≡ The Vector of Angular-Momentum $\overline{B}$ ≡ + Spin ≡ ↓↻ ≡ The Work stored** in the [4-1-3] **Semi circle of the , $\overline{r}$ - $\overline{c}$ Vectors circle-Surface ,Produced from the Gravitational-Force , G ,** as ACTING **into the -Planck- Cave , AND on the light Velocity Vector of , + ↓ $\overline{c}$** *Direction* . [107]
**Antigravity - g ≡ The Vector of Angular -Momentum $\overline{B}$ ≡ - Spin ≡ ↑↻ ≡ The Work** stored in the complementary [4-2-3] **Semi circle of the , $\overline{r}$ - $\overline{c}$ 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 , **- ↑ $\overline{c}$** *Direction* .
**k..** The **Black-Holes** exist as Parallel origination either as $\Rightarrow$ **Planar Black-Holes** or $\Rightarrow$ **Atoms - Black – Holes ,** when **G - Force i**s ACTING **On the -Planck – Cave** . [**E $_{13}$**]
**Momentum $\overline{B}$ & $\overline{w}$ ,** as **Real ≡** The <span style="color:red">**EXISTING - UNIVERSE**</span> as is the Real **Objective Reality |$\overline{s}$| ≡ The Numeric Vector-value** of The Material-Point [$\oplus$, r ,$\ominus$] in [PNS] ≡ **The Work stored in POLHODE - CONE of the |$\overline{OS}$| Rolling Nib -Vector Produced from the Eternal** <span style="color:red">**CENTRIPETAL - FORCE , F$_C$**</span> <span style="color:red">**AS THE**</span> Newton`s <span style="color:red">**ACTION**</span> **in the Planck`s - Cave, AND from the $\overline{B}$ Angular Momentum in the , + ↓ $\overline{B}$** , *Direction* . The Real Type is applied on all different Monads and their Compounds Monads . [109]
**Momentum $\overline{B}$ & $\overline{w}$ ,** as <span style="color:red">**Imaginary ≡**</span> The <span style="color:red">**BLACK - HOLES**</span> as is their Real **Objective Reality $\pm \overline{D}.i ≡ s \Rightarrow$ The Numeric Amplitude-Vector-value** of Material-Point [$\oplus$,r,$\ominus$] in [PNS] and **The <span style="color:red">Imaginary</span> - $\overline{D}.i$ ≡ <span style="color:red">CENTRIPETAL - FORCE</span> F$_C$ ≡ The Wave Amplitude -value ≡ The Work stored in the HERPOLHODE CONE of the |$\overline{OB}$| Rotating $\overline{B}$ -Vector and also Produced from the Eternal** <span style="color:red">**CENTRIPETAL - FORCE F$_C$**</span> , <span style="color:red">**AS THE**</span> Newton`s <span style="color:red">**REACTION**</span> **into the Planck`s - Cave AND from the $\overline{B}$ Angular Momentum in , - ↑ $\overline{B}$** *Direction*.

**l..** In case of Points A , B , C being on a Sphere then [STPL] becomes **a Cylinder** as this

is the **Angular-Momentum** $\overline{\mathbf{B}} = \frac{2L}{\overline{w}} = \frac{2L}{2\pi f} = [\frac{2L}{2\pi}].[\frac{1}{f}] = \frac{Constant}{2\pi} [\frac{1}{f_m}] = \textbf{SPIN}$   [89]

## D... THE ORIGINATION OF THE FUNDAMENTAL PARTICLES

### 1d… The Balancing of the Space and Anti-Space . [64]
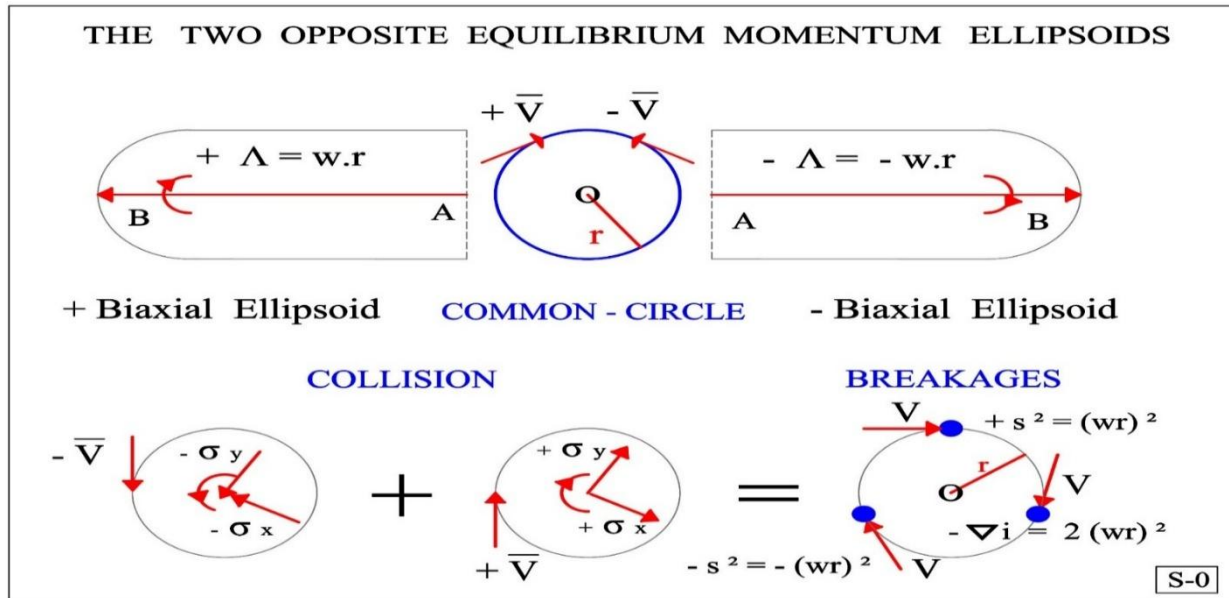


**Figure -18-** : The work W, of Two-Quaternion-monads $\vec{\mathbf{z}} = (s + \overline{v}.\text{⬚}i) \equiv \overline{\mathbf{AB}} \equiv \vec{\mathbf{w}}$ is the

**Action** Of any two Tangential & Opposite Equilibrium-Dipole $[\oplus\leftrightarrow\ominus]$ with $v = \vec{w}.r$.

For Quaternion **Actions** exists the square law for both **Real** and **Imaginary Part** , as

$\vec{\mathbf{z}} * \vec{\mathbf{z}} = (s + \overline{v}.\text{⬚}i )^2 = s^2 + [\overline{v}.\text{⬚}]^2 + 2.s\overline{v}.\text{⬚}i = s^2 - \overline{v}^2 \pm 2.s\ \overline{v} = |s|^2 - |\overline{s}|^2 \pm 2.|s|.|\overline{s}|$ , for $|\overline{v}| = s$

**Vorticities** $\pm \Lambda$ (Rotating Energy) , Becomes from the Collision on Common-circle and

from the Thrust on the Velocity-Breakages .The work is , W = [ n . P ] = [ λ.Λ] , where

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

Λ = the amount of Rotation on Dipole AB ( this is Angular Momentum and it is a vector ) .

Momentum $\pm \overline{\Lambda} = r.m.v = r\ m\ wr = mr^2.\overline{w}$ , where $\overline{w}$ is the angular velocity (Spin) which

maps velocity vector $\overline{v}$ on the Perpendicular to $\pm \overline{\Lambda}$ Plane with two components $\overline{v}_E \perp \overline{v}_B$ .

The Tangential velocity $\overline{v}_E = wr$ , is the quaternion $\overline{v}_E = w\ r = \overline{z} = [ s + \overline{v}.\text{⬚}i ]$ where $s = \overline{v}_E$

$= |r.\overline{w}|$ and $\overline{v}.\text{⬚}i = |\overline{w}\ x\ \overline{r}|$. In a Spherical cave the Biaxial Ellipsoid $(\sigma x = \sigma y)$ exists as

momentum $+\Lambda$ on caves of diameter 2r with parallel circles $\rightarrow 0$ .The Biaxial Anti-Ellipsoid

$(- \boldsymbol{\sigma}x = - \boldsymbol{\sigma}y)$ exists as equal and Opposite momentum $- \Lambda$ on the same diameter 2r with Anti

Parallel circles $\rightarrow 0$ . **Equilibrium** of the Two Ellipsoids $\pm \Lambda$ , Presupposes a **Stabilizer**-

System attached to Ellipsoids such that Opposite Momentum is distributed to the Center of

Mass of the Total - System , recover equilibrium , which is the center of the Spherical cave.

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

The Biaxial - Ellipsoid and Anti-Ellipsoid are inversely directed and Rotated in the same circle , so the two velocity vectors , $\bar{v}$ , $-\bar{v}$ , collide .This collision of the two Opposite Velocity-Vectors is the Physical-Action ( Thrust ) of the Two-Quaternion and their Action is ,

$( s + \bar{v}.⬚i )(©)( s + \bar{v}.⬚i ) = [s + \bar{v} .⬚i]^2 = s^2 + | \bar{v} |^2.⬚i^2 + 2|s|.|\bar{v}|.⬚i = s^2 - |\bar{v}|^2 + 2|s|.| \bar{w} r|.⬚i$
$= s^2 - |\bar{v}|^2 + [2\bar{w}].|s| |r|.⬚i$ , where , $s^2 = (r w)^2 \rightarrow$ Is the Real-Part of the New-Quaternion,
$- |\bar{v}|^2 = |\bar{w} \times \bar{r}|^2 = - (w.r)^2 \rightarrow$ The always Negative-Anti-Space ( a vector $\perp$ to w r Plane ) ,
$[2 \bar{w}].|s|.|\bar{r}.⬚i = 2w.(sr).⬚i \rightarrow$ The double Angular-velocity-Term , and for the PNS Space

where $|s| = |\bar{v}|^2$ then $s^2 = (w.r)^2 \equiv \oplus \equiv s^2 = +$ Charge
$- |\bar{v}|^2 = |\bar{w} \times \bar{r}|^2 = - (w.r)^2 \equiv \ominus \equiv - s^2 = -$ Charge
$[2\bar{w}].|\bar{v}||.\bar{r}.⬚i = 2 |\bar{v}|^2 = 2 (\bar{w}.r) \equiv 2[\oplus\leftrightarrow\ominus] \equiv 2s^2 = 0$ Charge

**i.e.** For the **Equilibrium-Recovery** (maybe a surface cylinder with 2r diameter) , Fig-16-17

**2d.. The Vibration of Particles in all Levels** [54] .
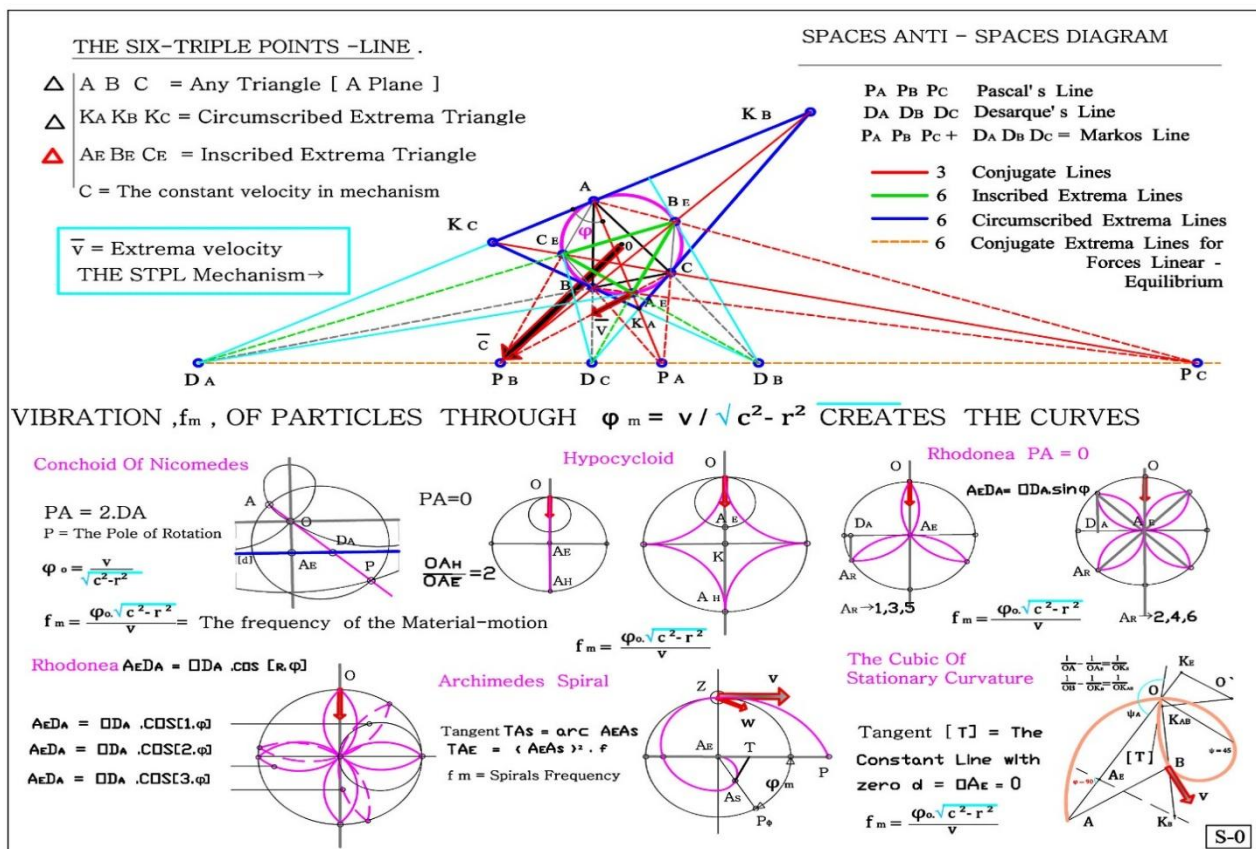


**Figure - 19-** : The Glue-Bond Electrons of Nucleus Rotor , form Rhodonea-like - Curves Curves created by Rotor`s electron are such that they keep a continuous Pressure on Protons.

**1..** The Continuous action of Negative $\ominus$ , on *One* Positive $\oplus$ , is equivalent to a Circular motion of the $\ominus$ , $\oplus$ , with velocity $v = \sqrt{F.r/m}$ , and this because exists $l = r =$ constant .

**2..** The Continuous action of Negative $\ominus$ , on *Two* Positive $\oplus\oplus$ of glued Bond , is equal to a Circular - and Other of one-step longer motion of $\ominus$ to $\oplus\oplus$ , or Circular motion on

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

the Common–length , l , in Polar equations is , **l = a . cos(c.θ)** or **l = a . sin(c.θ)** where

**a** = the length of the base =2r+2r = 4r , **c** = Rim`s number which Produce a **c-Petaled rose** ,

If **c** is odd or 2c-Petaled Rose and if **c** is even number. The Period of both cos(cθ) , sin(cθ)
   is $2\pi/c$ , and the number of petals for the period is [ 0 ,$2\pi/c$] will be c or 2c , according to
   as c is odd or c is even , so the degree of the Cartesian equation of the curve is , c +1
   for odd-c , and 2(c+1) for even-c .

**3..** The Continuous action of Negative $\ominus$ , on ***Three*** Positive $\oplus\oplus\oplus$ of glued Bond , is
   equivalent to a Circular-and Other of two-step longer motion of $\ominus$ to $\oplus\oplus\oplus$ , or
   Circular motion on the Common–length **. Length** , l , in Polar equations is ,
   **l = a . cos(c.θ)** or **l = a . sin(c.θ) ,** where **a** is the length of the base = 2r + 2r + 2r = 6r ,
   **c** = Rim`s number which produce a c-petaled rose , where **c** is odd or 2c - petaled rose
   number . This is seen and from equations issuing in Figure.21-2 $\rightarrow$ r = $r_D$.sin φ and
   R = $R_D$.sinφ where a , are the equal radius of Point A of Polar path . Rhodonea curves
   follow the Odd or and Even number of Protons in Nucleus by changing their Rolling-
   length a = (2r) , and the Polar – length l = a . cos(c.θ) depending on ,θ, as above .
   The common bonding Point of the Negative circle and the Positive line of the Rolling
   circle obliges that Point to follow the Cycloid motion in maximum degree and thus
   executing Hypocycloid motion . Particles Vibration in all Levels of Material-Geometry .

**4..** **The n-Knots** Figures exist in Figures where the **Vector -Force - Polygons** have the same
   number **n** , as the in Figures . For The **Circularly- Charged Breakages** the **3**-elements
   [Σ = n . h] $\Rightarrow$ [$s^2 = \oplus$ , $2s^2 = \varnothing$ , - $s^2 = \ominus$] formulate the ***Primary-Particles*** 3-K,Figures.
   Since **n =3** , the only Shape in Spaces is the ***Regular Triangle*** , and from this **n < 4→ n**
   there are vast regions of space that are very nearly empty of them ,

**5..** **The case of {TCIC}**≡ **[ Σ = n . h ]** $\Rightarrow$ 8 x ① which is **the Physical Mechanism** , gives
   the **n-masses** of Atom`s &Compounds determining the **Atoms Complex-Vector-Response**.
   These Particles exist in all of the universe in the sense that they are uniformly distributed
   throughout space and consist the ***Objective Reality*** which is the **existing Universe**

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .
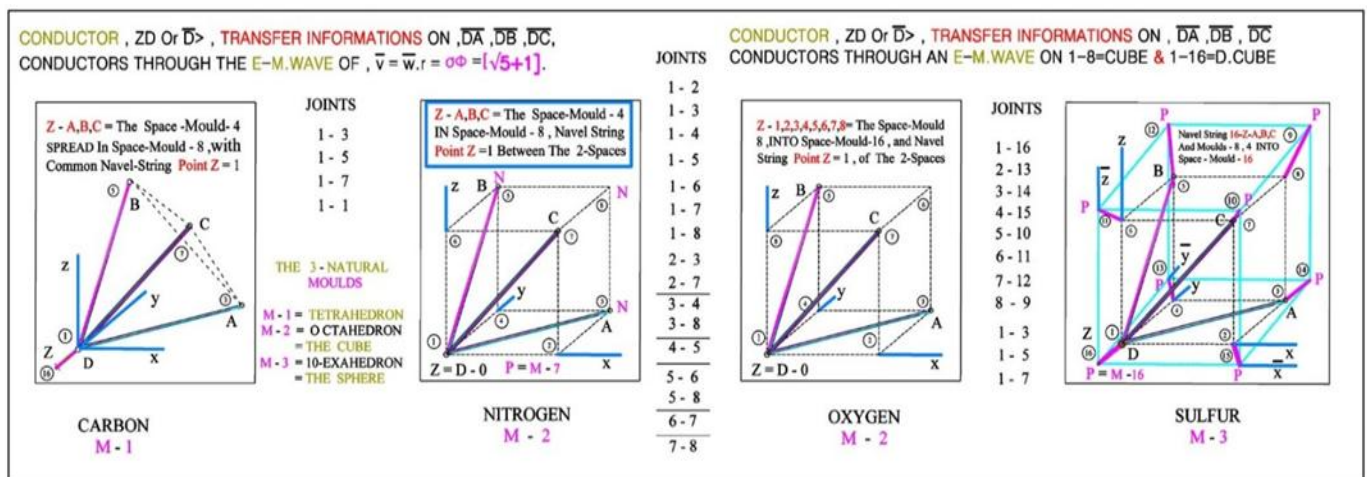
**Figure – 20-** : The Carbon , Nitrogen ,  Oxygen , Sulfur , Atoms-Conductors Sustains
**Into**  the First 4-Dimentional Spinning , **Tetrahedron - Cube – Sphere - Mould .**
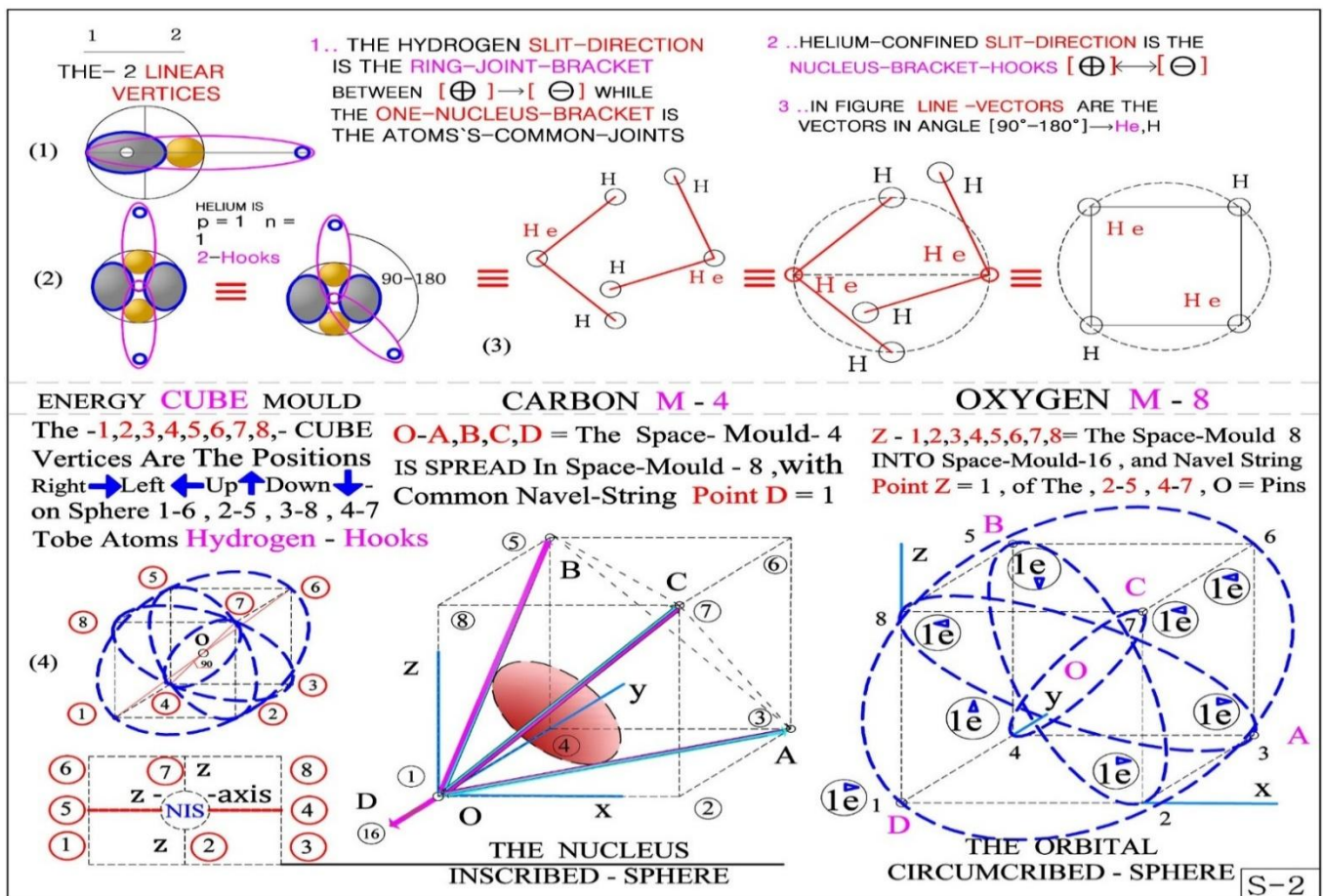


**Figure– 20a-** :The Hydrogen , Carbon , Oxygen , Atoms-Conductors **Into** the **Sphere-Cube-Mould** . Deka hexahedron , Octahedron ≡ Cube , Tetrahedron ≡ 4-Points , Triangle ≡ 3-Points , Vector ≡ 2-Points ≡ The Closed-Conductor , 1-Point ≡ The Opened -Conductor ≡ The Bracket-Hook . Oxygen is the Element which fills 8 - 2 = 6 vertices of Cube as EL →

$$\left\{ \begin{array}{ccc} 1e & 0e & 1e \\ 1e & \overset{\leftrightarrow}{2} & 0e \\ 1e & 1e & 1e \end{array} \right\} \equiv (\pm \tfrac{2}{2}) ,$$ where ⓪ is the first , **Zero-Acting Cube**  filled with 1e ,

therefore is the only Steady element which occupies the first Energy-Level ① with 2 Electron-Positions as ① = 2e = $\overset{\leftrightarrow}{2}$  Positions at $\overset{\rightarrow}{1}$ , $\overset{\leftarrow}{1}$

The Electron being in the Hydrogen-cave Precesses because of the different axis of Rotation And Nutation`s , from the continuous and immense-communication to the effect of gravity **g** . Since Electron is continually oscillating , with the Nutation-frequency **$f_N$ ,** so  Produces a continuous and oscillating Magnetic-field –M- which in turn is the source of an oscillating Electric-field – E - which implies the **Regeneration of each other** , i.e. it is a **Propagating Electromagnetic-Wave** where E = B c , and with a quantum-Energy $E = h f_N$ or  $E = 2\mu.B$ , This Energy E consists the Hydrogen Bracket  **Hook HBH** , or $[\overline{BH}]$  and it is the only **free monad** which can **Bond** to all Energy structures .

**5d.. The Natural Electromagnetic Energy-Tetrahedron and , The  3- Conductors Into The  Energy - Cube  and Spheres**  :  [102]

102
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

Figure – 20.a- The Dynamic Loading of → Tetrahedron – Cube - Sphere ← Atom –Structure. Material Geometry uses the Only-Three Elements for the ***Origination*** of Primary - Particles , as Weak , $W^-Z^o$ and Strong $W^+Z^{+0,-}$ Forces , Spin $\overline{B} = \overline{S}$ , Hydrogen cave , $r_H$ , and Electron $e^-$. where $[0] \equiv \varnothing \equiv$ The **Rest-Energy** $\equiv [\oplus \leftrightarrow \ominus] \to [\oplus \frac{::}{2} + \ominus \frac{::}{2}]$ , Split into Two . and , $[0] \equiv \overline{ZD} \equiv$ The **Rest Space** $\equiv$ Conductor $\begin{smallmatrix} + Z\vec{E} \to \\ - D\overline{M} \leftarrow \end{smallmatrix}$ , from relation $[\oplus \leftarrow ds \to \ominus]$ , where their **Properties** and **Corelations** are all **motions** into their Spaces , from Energy.

**In Fig-20b** The Electric - Magnetic Field of 3-Conductors which lie on the DABC
 **Tetrahedron** .**The Stability** of the → { $\oplus$ 4-**Space** [D A B C]} Regular – ***Tetrahedron*** , occurs **INTO the** {$\ominus$ 8-**Anti-Space** *Cube* , [$DA_1A D_1$ , $B B_1CC_1$]}, and The Positive → { $\oplus$ 8 - **Space** – *Cube* , [$DA_1A D_1$ , $B B_1CC_1$]} , **INTO The** {$\ominus$ 16-**Anti-Space** [ 1 ,2 ,3 ,4 ,5 , 6, 7, 8 - 9 ,10 ,11, 12 , 13 ,14 , 15, 16] } *Sphere Cube on Vertices*.= Point [The Point **16** $\equiv |\Rightarrow|\mathbf{Z}|$] consists the **Navel-String** Gate into the **Triangle-Circle-System** {Z-(ΔD,ABC) , Δ[T1T2 T3]} of the Stationary Bases which Results on the **2 -Anti-Parallel-Strands .**
 The Dual Photon $\overline{v} [\frac{\sigma\Phi}{2\pi r} + \frac{\sigma}{2\pi r}] \equiv \overline{v}.[\boxed{\overline{f_n}} + f_n]$ , occupies Stresses $= \sigma$ and velocities $\overline{v}$ , in
 The Tiny-caves **r** . The **Colours** in light , are the **Still-Sub-Units** in Storage $\to[\overline{v} .\boxed{\overline{f_n}}]\leftarrow$
 and exist as Frequencies of → Violet , Blue , Green , with their Complementary
 Yellow , Orange , Red ←

**Every** 8-electrons are **vibrations** on **Atoms-Cube-Structure** {**A Tetrahedron in Cube in a Sphere** } whether it be **Sound** or **Light .** Above Structure is followed by all Compounds . Molecules are Systems consisted of **The PERIFERAL** $\equiv$ *Skeleton* $M_{16}$ and **The CENTRAL** $\equiv$ *Fittings* $M_8$ , and the **ACCESSORIES** $\equiv M_4$ or $M_2, M_1$ . This Property of Atoms and of the Compounds is **The Critical-Valve of Switching the motion** as this happens in the Electro-magnetic Solenoid Valves with High or low Pressure and flow rates directly or Not .
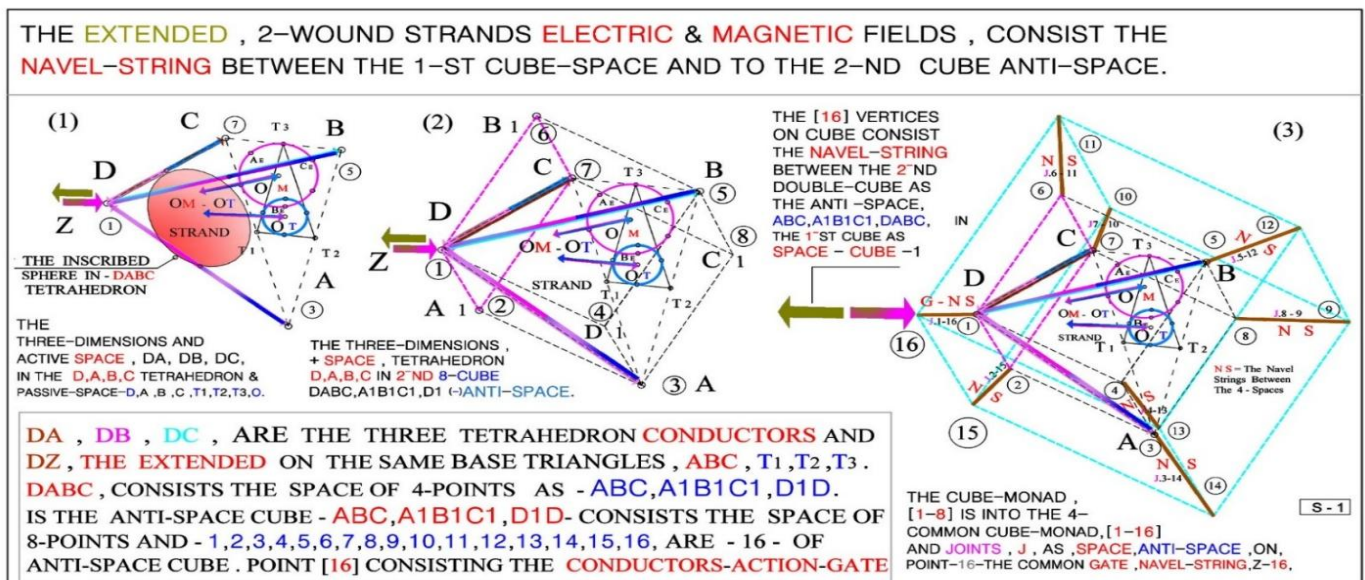


Figure – 20.b- :The Electric - Magnetic Field of 3, Conductors Results on **2 -Anti-Parallel-Strands** .**The Stability** of →{ $\oplus$ 4-**Space** [D A B C]} Regular - ***Tetrahedron*** , **IN** {$\ominus$ 8-**Anti-Space** *Cube* , [ $DA_1B D_1$ , $C C_1AB_1$]}, and The →{ $\oplus$ 8- **Space** [ $DA_1BD_1$ , $CC_1AB_1$]} *Cube*, **INTO The** {$\ominus$ 16-**Anti-Space** [ 1 ,2 ,3 ,4 ,5 , 6, 7, 8 - 9 ,10 ,11, 12 , 13 ,14 , 15, 16]} *Sphere*

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

*Cube Vertices* . Point [**16** ≡ |⇉|**Z**|] consists the **Navel-String** Gate in {Z-(ΔD,ABC),Δ[T1 T2 T3]} Stationary Bases . Stability Analysis in [88]

   DATA :

**A..** The Atoms Cube Coordinate-System :

   The relation of a Cube of Side a ,inscribed in a Sphere of Diameter d =2r , is in their Volumes as $V_{Sphere} = \frac{4.\pi\, r^3.}{3} = \frac{\pi\, d^3.}{6}$ , $V_{Cube} = a^3$ and since $d^2 = 2a^2 + a^2 = 3,a^2$ , then $\mathbf{a} = \frac{d.}{\sqrt{3}} = \frac{d.\sqrt{3}}{3}$
   $= \frac{\sqrt{3}.d}{3} = \frac{2\sqrt{3}.r}{3}$ ,and the Coordinates of the 8-Cube-Vertices are for Center O

→ $X_0 = 0$ , $Y_0 = 0$ , $Z_0 = 0$ ←  $X_1 = \frac{-a.}{2}$ , $Y_1 = \frac{-a.}{2}$ , $Z_1 = \frac{-a.}{2}$ , $X_2 = \frac{+a.}{2}$ , $Y_2 = \frac{-a.}{2}$ ,

   $Z_2 = \frac{-a.}{2}$ , $X_3 = \frac{+a.}{2}$ , $Y_3 = \frac{+a.}{2}$ , $Z_3 = \frac{-a.}{2}$ , $X_4 = \frac{-a.}{2}$ , $Y_4 = \frac{+a.}{2}$ , $Z_4 = \frac{-a.}{2}$ , $X_5 = \frac{-a.}{2}$ ,

   $Y_5 = \frac{+a.}{2}$ , $Z_5 = \frac{+a.}{2}$ , $X_6 = \frac{-a.}{2}$ , $Y_6 = \frac{-a.}{2}$ , $Z_6 = \frac{+a.}{2}$ ,

   $X_7 = \frac{+a.}{2}$ , $Y_7 = \frac{-a.}{2}$ , $Z_7 = \frac{+a.}{2}$ , $X_8 = \frac{+a.}{2}$ , $Y_8 = \frac{+a.}{2}$ , $Z_8 = \frac{+a.}{2}$ ,

Since **Tetrahedron** in Cube is formed in three Equal-Diagonals $d_{1-3} = a.\sqrt{2}$ , $d_{1-5} = a.\sqrt{2}$ , $d_{1-7} = a.\sqrt{2}$ of the Perpendicular 3-Planes , $P_{X-Y} = P_{Y-Z} = P_{Z-X} = a^2$ , and since issues $d_{1-3} \perp d_{1-5} \perp d_{1-7}$ , these consist **The-Scanning Vectors-Plotting for all Systems** . Since the Cube's Outer-Sphere diameter d , is equal to the Cube-Diagonals [1-8] , [2-5] ,[3-6] , [4-7] , therefore consist 4-Big circles on Sphere and Perpendicular between them , in Contradiction to the 3 circles in the 3-Planes which consist the Small circles .

The Geometrical Matric of **Tetrahedron-Cube-Sphere Mould** = ( STCS ) where ,

**P1  P2  P3**
**P5  Po  P4**   $P_0$ = The Coordinates $X_0$ , $Y_0$ , $Z_0$ of the Common Center of 2-Spheres .
**P6  P7  P8**

$P_1$ = The Coordinates $X_1$ , $Y_1$ , $Z_1$ of the Tetrahedron- Cube Point -1
$P_2$ = The Coordinates $X_2$ , $Y_2$ , $Z_2$ of the Sphere - Cube Point - 2
$P_3$ = The Coordinates $X_3$ , $Y_3$ , $Z_3$ of the Tetrahedron- Cube Point -3
$P_4$ = The Coordinates $X_4$ , $Y_4$ , $Z_4$ of the Sphere - Cube Point - 4
$P_5$ = The Coordinates $X_5$ , $Y_5$ , $Z_5$ of the Tetrahedron- Cube Point -5
$P_6$ = The Coordinates $X_6$ , $Y_6$ , $Z_6$ of the Sphere - Cube Point - 6
$P_7$ = The Coordinates $X_7$ , $Y_7$ , $Z_7$ of the Tetrahedron- Cube Point -7
$P_8$ = The Coordinates $X_8$ , $Y_8$ , $Z_8$ of the Sphere - Cube Point - 8

On the above Geometrical Coordinates SYSTEM are Placed the 4-Spaces

from the OZ = OD - EXTENDED CONDUCTOR and equal to Monads .

**For the Cave-Spin** , $\bar{S}$ = r m v which is **a Monad** , exist the **4-Spaces** as **Fig-1**

   → (( The **n -** Spaces of Spin $\bar{S}$ are the Polygons $\mathbf{S^n}$ ,

      The **n** Anti-Spaces of Spin - $\bar{S}$ are the Polygons - $\mathbf{S^n}$ )) ←

   The Sub-Spaces $\pm \sqrt[n=1-\infty]{\bar{S}}$ are the Polygons with **n = 1 ≈ ∞ Knots**

   **Since Knots are the Degrees of the Polynomials of each Monad then ,**

**The OZ Monad Determines the Number of Knots beginning from Number 3 ,**

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**3** $\Rightarrow$ is the Figure of Regular Triangle in Poly-3$^{rd}$ Degree **.** The - 3 and $\pm \sqrt[n=3]{\overline{OZ}}$

**4** $\Rightarrow$ is the Figure of Regular Square in Poly-4$^{rd}$ Degree **.** The - 4 and $\pm \sqrt[n=4]{\overline{OZ}}$

**5** $\Rightarrow$ is the Figure of Regular Pentagon in Poly-5$^{rd}$ Degree **.** The - 5 and $\pm \sqrt[n=5]{\overline{OZ}}$

**6** $\Rightarrow$ is the Figure of Regular Hexagon in Poly-6$^{rd}$ Degree **.** The - 6 and $\pm \sqrt[n=6]{\overline{OZ}}$

**7** $\Rightarrow$ is the Figure of Regular Heptagon in Poly-7$^{rd}$ Degree **.** The - 7 and $\pm \sqrt[n=7]{\overline{OZ}}$

**8** $\Rightarrow$ is the Figure of Regular Octagon in Poly-8$^{rd}$ Degree **.** The - 8 and $\pm \sqrt[n=8]{\overline{OZ}}$

**9** $\Rightarrow$ is the Figure of Regular Eniagon in Poly-9$^{rd}$ Degree **.** The - 9 and $\pm \sqrt[n=9]{\overline{OZ}}$

**N** $\Rightarrow$ is the Figure of Regular N-gone in Poly-N$^{rd}$ Degree **.** The - N and $\pm \sqrt[n=N]{\overline{OZ}}$

**Remarks :**

1… **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** .

2…**The case of {QUA}** $\equiv$ **[ Σ = n . h ]** $\Rightarrow$ ∞ x **Φ** which is **the Physical Mechanism** , gives the ∞ - *Impedance* **b** determining the *Objective Reality* which is the **existing Universe.**

For **n =2** then **[Σ = n h]** $\Rightarrow$ 2 x G /Φ , IS the light-velocity $\bar{v} = [\frac{G\,\Phi}{A}]$ =2.9982.$10^8$ m/s.

For **n =1** then **[Σ = n h]** $\Rightarrow$ G / c = Charge $\bar{q} = \frac{G}{c\sqrt{2}}$ = 1,58.$10^{-19}$ Coulomb .

3… For **n** = **3** is **STPL** Mechanism which creates the Elementary Particles , [**n-Knots** = **3**] in Gravity-Voltage **V** $_{GRA}$ = 7,593.$10^{35}$ **V**. This is because the Primary motion $\equiv$ [**PM**] exist from the three - **3** Breakages elements **[Σ = n . h]** $\Rightarrow$ [**s² =** $\oplus$ , 2s²=∅ , **- s² =** $\ominus$]

**B..** The Atoms-Elements Mass , Stiffness - Flexibility [101]

**6d..The Dimensioning** of the [**STPL**] – **Mechanism**

Defining the lengths , **a** = $K_B\, K_C$ , **b** = $K_C\, K_A$ , c = $K_A\, K_B$ , **d** = $[\frac{a+b+c}{2}]$ =The semi-perimeter then the Inscribe radius **r** = $\frac{\sqrt{d(d-a)(d-b)(d-c)}}{d}$ = |OA| , The Coordinates for the Point K=$D_A$ are $[\frac{bc}{b+c-a}] : [\frac{ca}{c+a-b}] : [\frac{ab}{a+b-c}]$ , while for Point O are $[\frac{b+c-a}{a}] : [\frac{c+a-b}{b}] : [\frac{a+b-c}{c}]$ . Fig-17 The STPL Mechanism is the Mould consisted from any Common circle **O,OA**=[OA`$\equiv$ OA$_E$], **O,OB** = [OB`$\equiv$ OB$_E$] , **O,OC** = [OC`$\equiv$ OC$_E$] , and the Common lines $D_A$-$P_A$ , $D_B$-$P_B$ , $D_C$-$P_C$ all on a line of STPL . On the infinite Sectors $AD_A$-$AP_A$ , $BD_B$-$BP_B$ , $CD_C$-$CP_C$ vibrate , the

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

Breakages [$\pm$ **s²** $= \pm$ (w r)²] and [i $= 2$(w r)²] forming all families of curves and the Euler - Savary Coupler - curves of the Cubic-Of-Stationary - Curvature Mechanism of Spaces , Anti-spaces Vibrating the End-curves . The Dimensioning of the Mechanism is Possible by using the analytical geometry. [91] The Dimensioning of Proton – Neutron In Fig-26 , and others with Compounds In Fig-27 .The Dimensioning of Hydrogen and Atoms In Fig-28-30,

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

**a..** Difference of Phase $d_\varphi = 90^o$ emission is $\rightarrow$ The Eight-Shapes $\infty$ .

**b..** Difference of Phase $d_\varphi = 0^o$ emission is $\rightarrow$ The Ellipse-Shapes $\propto$ .

**c..** Difference of Phase $d_\varphi = 45^o$ emission is $\rightarrow$ The Double-Saddle-Shapes . $\mathcal{B}$ , $\mathcal{CD}$ .

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

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

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

Equation (3) is the smallest *Energy-Unit of Space* , and this because is for $s = 0$ and $k = 1$. It was shown [31] that Space and Energy is quantized and measured on the two Constant and Natural numbers $e$ , $\pi$ , where for base the natural logarithm , $e$ , and exponent the decimal base , $b = 10$ . From $\rightarrow z^{1/w} = ( s + \bar{v}\ i )^{1/w} = |zo|^{-w}.[\cos.(\varphi + k\pi)/w + i.\sin.(\varphi + k\pi)/w]$ $=|zo|^{-w} . e^{-i.(\varphi + k\pi).w}$ for $\cos.(\varphi + k\pi)/w = 0$ then exists only the **Imaginary part** of monad

$(\bar{v}\ i\ ) \neq 0$ , where $\varphi = \pi /2$ and then , $z^{1/w} = |zo|^{-w} . e^{i.(\varphi + k\pi)/w} = e^{-i.\left(\frac{\pi}{2} + k\pi\right).10}$ which is the

*Diffraction Energy mechanism* for all Space Levels of quantization which are the **Energy Particles only** i.e. The Energy particles **in Stationary caves** are $z^{1/w} = |zo|^{-w}$. Lv = E-Monad. Extending quantization of Energy according to exponential formula$\rightarrow$ $L_v = e^{- i.(5\pi/2).10}$ then $L_v$ on the decimal base $b = 10$ and for $k = \pm 0 \rightarrow \pm \infty$ , are the **Energy caves** as ,

For base $e = 2,71828$ and base $b = 10$ then e^ - (13,8155) $=$ **1** $.10^{-6}$ **m**

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

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

Placing **r** , in the Dynamic-Space-Energy relation when g $=1$ then $r^3.f^2_p = 1$ and $f^2_p = \frac{1}{r^3}$ $= 8,0647139.10^{20}$ m and occurs the , **minimum frequency** $f_{min} = 2,839844. 10^{10}$ **H** …(4)

**7d.. The Cosmic Particles in The Cycloid , Anti-cycloid Evolute :**

The moving monads in Cycloid Equilibrium in the Anti - Cycloid ( Evolute ).

The equilibrium of the Resultant forces is obtained by the above Cycloid , Anti-cycloid *Evolute* Forces , or by the Rotor and Spin in one Rim , as was shown.

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

In Rims is possible the forming velocities greater than that of light , and this because of different , r , and the Tangential velocities are kept with the same angular velocity , **the Spinning** , unless Spinning changes in such way to keep light-velocity constant .
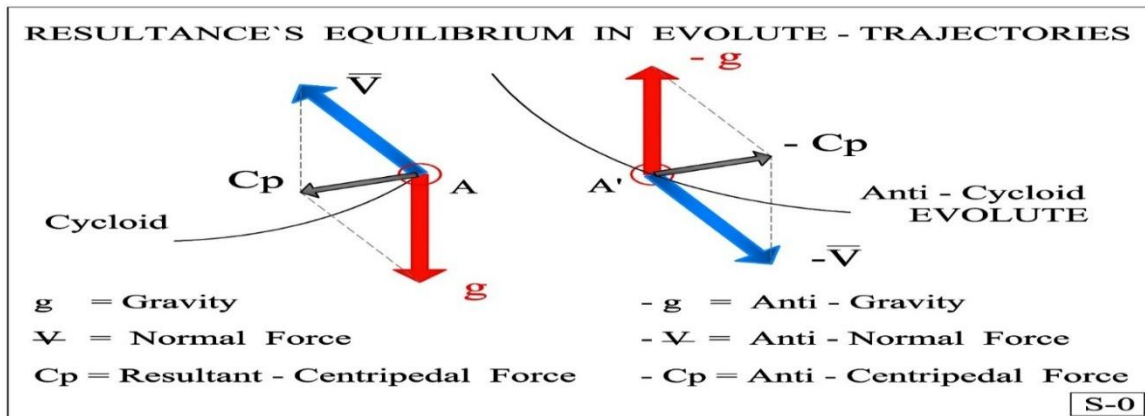


**Figure 25**  The Equilibrium of the Resultant Forces , *in the Cycloid and for motion Wavelength , and of any other Removal Monad . The Intrinsic Space is* (*Wavelength* = [λ] ) *, as the Energy Quanta .*

**The Equilibrium of the Three-Spaces , The Space Anti-Space , Neutral-Space :** [60]

**The Stability of Elementary Particles , Conductors and the Atoms -Nucleus  Fig-24**

The **Equations of motion become everywhere** from any **Opposite** Space ≡ $\oplus$ , Anti-space ≡ $\ominus$ . During these motions as , **ds** . is Done a Constant-Work , **k** , or and from their velocities $\bar{v}$ and this Work may be **Positive** or **Negative** for Equilibrium . In F-23 Cycloid Anti-cycloid motion is as , D. The Origination of Gravity **g** , Antigravity [- **g** ]

**In Fig-20.b** , Conductor D = d = $AK_A$ where $\oplus$ constituent attacks $\ominus$ by a Hook`s law force as Stress  σ = E u , and an Coulomb force F $_{[+ \leftrightarrow -]} = \frac{[\oplus \leftrightarrow \ominus]}{r^2} = \frac{[2\,\sigma]}{r^2}$ , creating Work ≡ motion as was shown  It was shown that , **The Stability** of **Nucleus Forces** , is succeeded through *The Pascal`s - Ceba`s*  triangle launched caves **r ,** while Leptons from their *Anti - Leptons* existence in the same launched Pascal`s - caves **r .**  [58]

The Equilibrium of the Three-Spaces is Done on the three Cyclic-Quadrilaterals ($AB_E A_E C_E$) ($BC_E B_E A_E$) , ($CA_E C_E B_E$) of the  6 Conductors each for ,  [a , b , c , d , p , q ] x [3-ABC] = 18 Conductors .  **Linearly** is through *the Products* of the Diagonal - connectors *as* , → → → $[AA_E].[B_E C_E] = [AC_E].[A_E B_E]+[AB_E].[A_E C_E]$ , $[BB_E].[C_E A_E] = [BA_E].[B_E C_E]+[BC_E].[B_E A_E]$ , $[CC_E].[A_E B_E] = [CA_E].[B_E C_E]+[CB_E].[C_E A_E]$   and , **Rotationally** through *the Ratio* of  the Diagonals ≡ The Conductors $|\frac{AK_B}{AK_C}|x|\frac{BK_C}{BK_A}|x|\frac{CK_A}{CK_B}| = 1$ or  ± **Rotational-Equilibrium as ,** $[AK_B].[CK_A].[BK_C] = [AK_C].[BK_A].[CK_B]$ , of all Opposites $\Rightarrow$ **Tangential-Electromotive Forces** . From Mechanics-Physics , *all Systems Possessing Elasticity ≡ motion and Reaction to motion ,* the called mass *, are capable of  free vibration  or vibration taking Place in the Absence of External Excitation* [7] .This Principle issues for Both Closed **or** Open Systems.

**i.e.** either for the Nucleus where issues *The Pascal`s - Ceba`s*  triangle  Stability , or for the  Orbitals where issues  the  *Tetrahedron - Cube – Sphere – Mould .*

### 8d.. The Stability of the Cosmic Particles Conductors and Atoms – Nucleus .
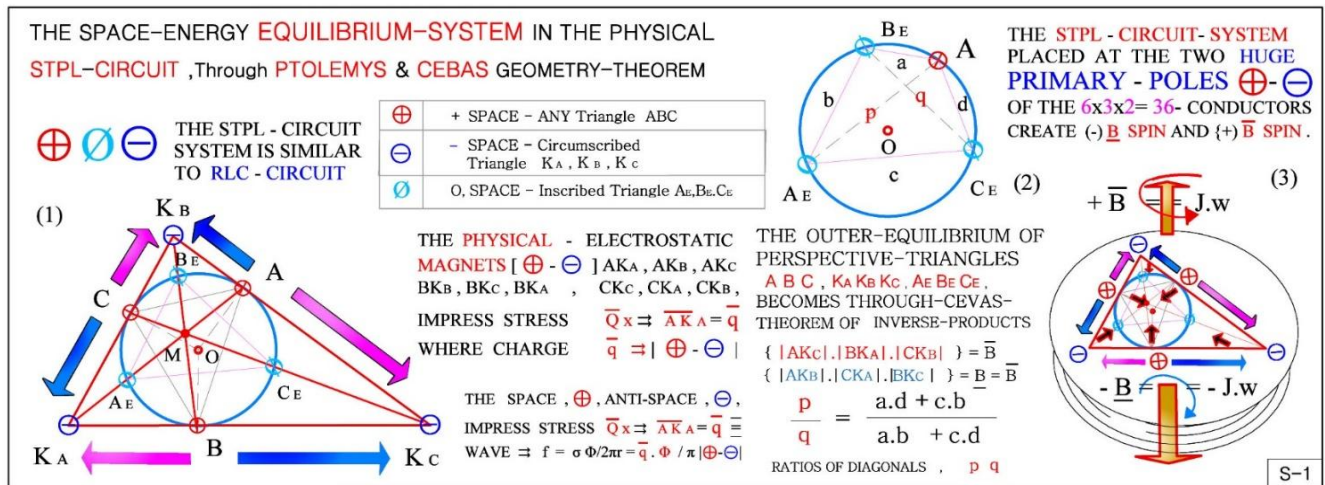


**Figure -26-** : **The Stability** of → { $\oplus$ - **Space** [A B C] },{$\ominus$ - **Anti-Space** [$K_A$ $K_B$ $K_C$]} , of **The Sub-Space** [$A_E$ , $B_E$ , $C_E$]}, and **Neutral-Space** {[$\oplus\leftrightarrow\ominus$] ≡ ds ≡ [$\oplus\leftarrow$ds$\rightarrow\ominus$]}.

*Since , Energy of the first Wheel-Rim or Orbital is distributed to the couple of (2e)*

*Electrons of the Orbital , then this is a Cycloid - Anti-cycloid - Stability System .*

This Still Systems of **Space –Anti space DOES NOT** mean Matter–Antimatter but

The **State of Equilibrium in Caves ≡ The Ceba`s Energy triangle** .

**a**…**The Space Anti-Space and , Neutral-Space Conductors :** [60]

The Equations of motion become everywhere from any Opposite , Space ≡ $\oplus$ , and Anti-space ≡ $\ominus$ . During these motions as , **ds** . is done a Constant-Work , **k** , or and from their velocities $\bar{v}$ . In Figure Conductor D = d = $AK_A$ where $\oplus$ constituent attacks $\ominus$ by a Hook`s law force as Stress $\sigma$ = E u , and an Coulomb force $F_{[+ \leftrightarrow -]} = \frac{[\oplus\leftrightarrow\ominus]}{r^2} = \frac{[2\sigma]}{r^2}$ , creating Work ≡ motion as was shown . [58]

It was shown that , **The Stability** of **Forces** is succeeded in *The Pascal`s* - launched caves **r** while Leptons , from their *Anti - Leptons* existence in the same launched Pascal`s-caves **r .** The Equilibrium of the Three-Spaces is succeeded on the three Cyclic - Quadrilaterals → ($AB_EA_EC_E$) , ($BC_EB_EA_E$) , ($CA_EC_EB_E$) of 6 Conductors each [a , b , c , d , p , q ] x [3-ABC] = 18 Conductors .

**Linearly** is through *the Products* of the Diagonal - connectors *as* , → → → [$AA_E$].[$B_EC_E$] = [$AC_E$].[$A_EB_E$]+[$AB_E$].[$A_EC_E$] , [$BB_E$].[$C_EA_E$] = [$BA_E$].[$B_EC_E$]+[$BC_E$].[$B_EA_E$] ,[$CC_E$].[$A_EB_E$] = [$CA_E$].[$B_EC_E$]+[$CB_E$].[$C_EA_E$]   and , **Rotationally** through *the Ratio* of Diagonals ≡ The Conductors $|\frac{AK_B}{AK_C}|$x$|\frac{BK_C}{BK_A}|$x$\frac{CK_A}{CK_B}|$ = 1 or the $\pm$ **Rotational-Equilibrium** [$AK_B$].[$BK_C$].[$CK_A$] = [$AK_C$].[$BK_A$].[$CK_B$] ,of all above Opposites → **Tangential-Electromotive-Forces** ← From Mechanics ,*all Systems Possessing Elasticity ≡ motion and Reaction to motion ,* called mass *, are capable of free vibration or vibration taking place in the Absence of External Excitation* . [7] From **Lorentz-Force** , **F = $\bar{q}$ $\bar{v}$ x $\bar{B}_F$** , where , $\bar{q}$ ≡ Charge , $\bar{v}$ ≡ The velocity of Charge , $\bar{B}_F$ ≡ The Strength of Magnetic field and Centrifugal Force , $F_{CF} = m.w^2_R.r$ .

From Cave-Spin , $\bar{S} = r\ m\ v$ then mass m $= (\frac{S}{r.v})$ .Equating equations then , $F \equiv F_{C\,F} \equiv$ $\bar{q}\,\bar{v}$ x $\bar{B}_F$ , and $Q_{\pm} = m.w^2_R.r = (\frac{S}{r.v}).w^2.r = \frac{S.w^2}{v} = \frac{S.v^2}{r^2.v} \equiv |\frac{v.\bar{S}}{r^2}|$ ….(EMF) where exists $r_{min} = \sqrt[2]{\pi b^{-n}}$ , [95] , [96BB] .

**Electromotive-Forces , F $= \bar{q}\,\bar{v}$ x $\bar{B}_F = Q_{\pm} = \frac{v.\bar{S}}{r^2} \equiv |\frac{c.\bar{S}}{r^2}|$, are The Elementary-Particles** {F, L ,Q }. From Electromotive-Force in min-cave $r = 1,7724538.10^{-3}$ m. exists Electron-Force-Charge $\bar{q}_e$ as $Q_{\pm} = |\frac{c.\bar{S}}{r^2}| = \frac{[2,998.10^8].[1,0546.10^{-34}]J}{(1,7724538.10^{-3})^2} = 1,6022.10^{-19}$ eV , which is the

**Electron-Force-Charge** and also from the Gravitational-Stress-Charge $\bar{q}_{Electron} = \frac{G}{c\sqrt{2}}$ $= \frac{6,6736923\ .10^{-11}}{1,41429.2,9979346.10^8} = 1,574.10^{-19}$ C . Electromotive-Force in the min-cave $e^{-15,572707} =$ $r = 1,7252787.10^{-7}$ m , and the Gravitational-Force G becomes also as ,

$Q_{\pm} = |\frac{c.\bar{S}}{r^2}| = \frac{[2,998.10^8].[6,62606957.10^{-34}]}{(1,7252787.10^{-7})^2} = 6,673692.\ 10^{-11}$ , which is the G - Physical-Force-Charge. When the Heap of the Elementary Particles on $D_A$-$P_A$ line , is compressed and gets out the line then is a reason for Black Hole creation .

**b…The relation of the n , Degree of Polynomials and Electromotive-Forces Vibration .**
 The **Transportation of Energy** on Edge-Points happens in **Material Geometry** , while the **Transportation of** the Edge-Points as **, Positions ,** exists in **Vector Geometry** only.
Since in Vibrations the **Deformation** of the **Spring is an equilibrium Position in** $\Delta$ , and the Spring-Forse k $\Delta$ = w = m g = Gravitational force **w** acting on mass **m** , then exists $\rightarrow$
**m $\ddot{x}$ = $\Sigma$F = w = k [ $\Delta$ + x]** ….(1) , and because **k $\Delta$ = w** we obtain $w^2_n$ = k/m.. (2) and (1) becomes $\rightarrow$ **$\ddot{x}$ + w$^2_n$ = 0** ,… **(3)** $\leftarrow$ i.e. **The Transportation of Energy is a Harmonic -** Vibration in cave $\Delta$ , *meaning the Wave Pattern .* **From before the Cave-Spin** , $\bar{S}$ = r m v is **a Monad** , and occupies the **4-Spaces** as the **Fig–1 .** i.e.

 $\rightarrow$ (( The **n** - Spaces of Spin $\bar{S}$ are the Polygons $S^n$ ,

 The **n** Anti-Spaces of Spin - $\bar{S}$ are the Polygons - $S^n$ )) $\leftarrow$

 The Sub-Spaces $\pm \sqrt[n=1-\infty]{\bar{S}}$ are the Polygons with **n = 1 $\approx$ $\infty$ Knots**

Since the number of **Knots n ,** are the Degrees **N** of the Polynomials of each Monad and Since the n - masses - Spring **m$_n$** is an equilibrium Position in $\Delta$ , of the equation of motion $\rightarrow$ **$\ddot{x}$ + w$^2_n$ = 0** $\leftarrow$ then the **4-Spaces of Monad are the Polygons of n-Knots and equal to the N** Degrees Roots of the Polynomials .

 THE PROCESS OF ACTIONS IN THE 4=SPACES

**1…**A Heap of **n**-masses Vibrates and Equilibrium .
**2…**A Heap of **n**-masses Equilibrium at the **n**-Mode Shapes Waveform .
**3…**A Heap of **n**-masses of **n**-Mode Shapes occupies the Resultant E-Spectrum
**4…**Each-One of the **n**-masses *occupies* **n**-Mode Shapes , **n**-Element .Spectrum ,
 4-**P**.Spaces , **4.n**.. Regular-Polygons of **n**-Degree , with **4.n**..Knots and Roots .
**5…**Each-One of the **n**-masses is an E -Monad occupying **4-Primary**-Spaces , and

109
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

Forms **4.n**.. Regular-Polygons of the **n**-Degree , and with **4.n**..Knots as Roots ..

**6…**Each-One of the **n**-masses is an E-MONAD occupying all above Properties (Signals).

**9d.. The Origination of Proton and Neutron Cosmic Particles** .

The Elements in the Proton & Neutral-caves → { Masses – Charges - Forces } [89]
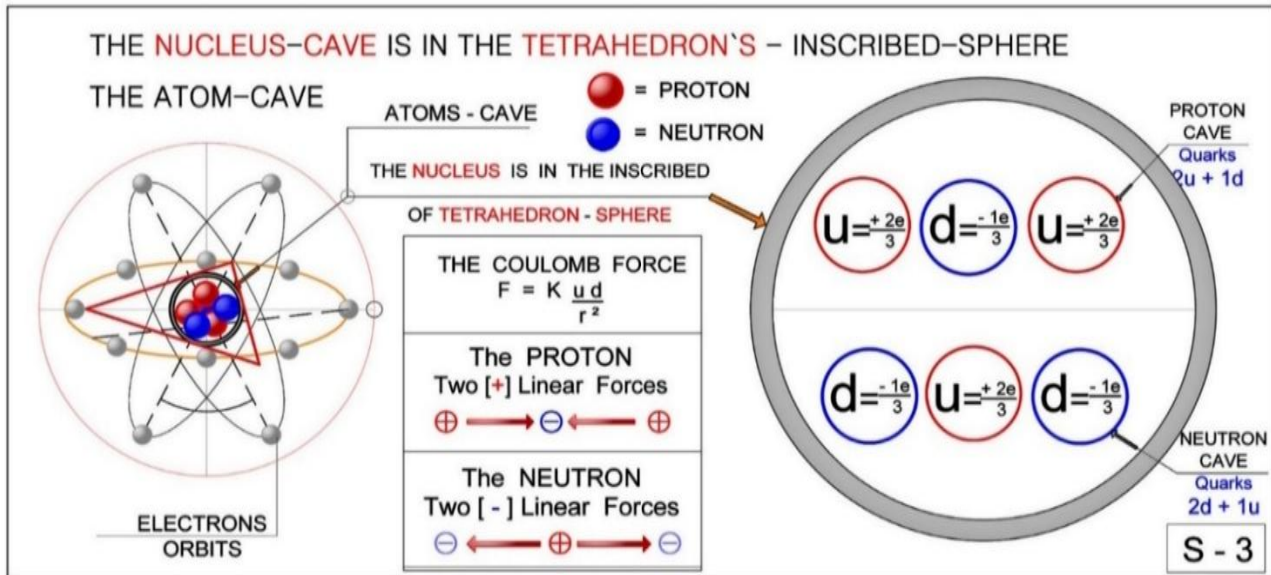


**Figure-27 :** The Sphere-Structure of the **Hydrogen-Nucleus** , ⊕ Proton ,[⊕↔⊖]=Neutron

Proton is consisted of Three-Primary-Opposite-Spaces ⊕ , ⊖ , [⊕↔⊖] , having

masses m $_p$ , Charges $\bar{q}_p$ , and caves a $_p$ = r .

The Nucleus`s Cave r , exists in the Inscribed to the Tetrahedron Sphere .

The **elements in Proton** are the Two **u**-Quarks and One **d**-Quark .

The **Hydrogen-Nucleus** is in the Inscribed Sphere from the

{ **Inscribed Sphere -Tetrahedron – Cube - Circumscribed Sphere - System** }.

In order to shift the **u-d-**Quarks of an **Anti-Proton** into a Proton Spin-Pair require an extra input of Energy-(MeV) , so would **Proton Paired with a Neutron be Stable** .

The Total mass $M_T$ in Proton follows , The Parallel Connections Resistors inverse

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

The System Total- Harmonic-Charge $\equiv Q_T \equiv 2.q_u + q_d = 2.(2/3).e - (1/3) e = + \frac{3}{3} e =$

+ 1,6022.$10^{-19}$ C , and the System-Resonance-Charge $Q_T$ = + 1, 6022.$10^{-19}$ C ...(2)

The Proton Total- Harmonic- Charge $\rightarrow Q_T \equiv 2.q_u + q_d$ ,and for the Resonance Frequency

of the Unit-Cave is the Stationary-System becoming from Kepler second Planetary-law as

equation , $4 \pi^2 m f^2_o = k$ , and constant law of Areas $1 = k .f^2_o a^3$ . Their common k , is the

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

Constant-Energy $\rightarrow$ k = 4 $\pi^2$ m $f^2_p = \dfrac{1}{f^2_p\, a^3}$   or , $f^4_p = \dfrac{1}{4\pi^2 ma^3}$ and $f_p = \sqrt[4]{\dfrac{1}{4\pi^2 m.a^3}}$ .

   **The measured magnitudes are as follows** ,

**a-Proton⊕→** mass $m_p$ = 1,672.$10^{-27}$ Kg →Charge $C_p$ =1,602.$10^{-19}$ C → a = 8,4.$10^{-16}$ m

**b-Electron⊖→**mass $m_e$ = 9,11.$10^{-31}$ Kg →Charge $C_e$ =1,602.$10^{-19}$ C → a = 5,0.$10^{-17}$ m

**c-Neutron[⊕↔⊖]→**mass $m_n$ = 1,672.$10^{-27}$ Kg →Charge $C_n$ = 0 ,0 C → a = 1,7.$10^{-15}$ m

**d-u**-Quark →from equal masses $m_p$ =2.$m_u$ + $m_d$ =3.$m_u$ =1,672.$10^{-27}$ Kg and Quark masses

$m_u$ = $m_d$ = $m_p$ / 3 = 5,573.$10^{-28}$ Kg , and $\dfrac{1}{M_T} = \dfrac{1}{m_u} + \dfrac{1}{m_u} + \dfrac{1}{m_d} = \dfrac{3}{m_p} + \dfrac{2.3}{m_p} = \dfrac{9}{m_p}$ and Proton

**Resonance mass** $M_T = \dfrac{m_p}{9}$ = 1,857777.$10^{-28}$ Kg ≈ 16,7267 m Ev/c² .......(m)

For Proton issues $q_p$ = 2.$q_u$ + $q_d$ = 2.$\dfrac{2}{3}$ e - $\dfrac{1}{3}$ e = e , and the Stability of forces is axial .

**Electron-Charge** $C_e$ =1,602.$10^{-19}$ C , while $C_{qu} = \dfrac{2}{3}$ e = + $\dfrac{2}{3}$ 1,602.$10^{-19}$ C

$C_{qd}$ = - $\dfrac{1}{3}$ e = - $\dfrac{1}{3}$ 1,602.$10^{-19}$ C , and from

$Q_T \equiv 2.q_u + q_d$ , then Proton Resonance charge $Q_T = \dfrac{3.q_p}{3}$ = 1,602.$10^{-19}$ C ..........(c)

Proton-Resonance frequency $f_p = \sqrt[4]{\dfrac{1}{4\pi^2 m.a^3}} = \sqrt[4]{\dfrac{1}{4\pi^2 5,573.10^{-28}(8,4.10^{-16})^3}}$ = 5,26241.$10^{17}$ H

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

Magnetic-field $\overline{B}_F = \dfrac{|2\pi.m_T|}{Q_T}$ f $= \dfrac{2\pi.1,85777.10^{-28} 5,262409.10^{17}}{1,6022.10^{-19}}$ (Kg/Cs) = 3,83389.$10^9$ Tesla

which is the Strength of a Magnetar , **i.e.** A type of Neutron-Star having an extremely
Powerful Magnetic-field , and Electric-Forces to be over Ten-Thousands-Newton .
The Electric Force between the u-Quarks and d-Quarks in Proton is from Coulomb law

$F_{ud-p}$ = $C\dfrac{q_1.q_2}{r^2}$ = 8,9875.$10^9$(Nm2/c²).$\dfrac{2}{9}$[1,602.$10^{-19}$ C]²$\dfrac{1}{(10^{-16})^2}$ = 1,997222.$10^6$ N ...(F p)

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

$F_{ud-n}$ = $C\dfrac{q_1.q_2}{r^2}$ = 8,9875.$10^9$(Nm2/c²).$\dfrac{2}{9}$[1,602.$10^{-19}$ C]²$\dfrac{1}{(10^{-16})^2}$ = -1,997222.$10^6$ N ..(F n)

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

For the Neutral-cave issues $q_n$ = 2.$q_d$ + $q_u$ = - 2.$\dfrac{1}{3}$ e + $\dfrac{2}{3}$ e = 0.e , and the Stability of forces

is axial as in Proton and this because the Dynamic-Strip-Polygon doesn`t close . For ,

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

**1..** Neutrinos , v , mass m = $(3,11 .10^{-6})$ MeV/c² x $1,8.10^{-28}$ = 5 , 598 . $\mathbf{10^{-34}}$ Kg

The Spin is , $\mathbf{S_v}$ = $5,691952.10^{-34}$ {Kg/m/s}, $\mathbf{a_v}$ = $7,0.10^{-21}$ m , $\mathbf{f_v}$ = [$\mathbf{E_{vK}}$ = mc²] / h =

$5,6.10^{-34}$ $[10^{17}].1,6022.10^{-19}$ = $8,96912.10^{-36}$ J/[$6,626.10^{-34}$ Js = 13,536244. $\mathbf{10^{1}}$/s

From cave r = $7.10^{-21}$ m then f = $\sqrt[2]{\dfrac{1}{g.a^3}}$ = $\sqrt[2]{\dfrac{1}{9,81(7.10^{-21})^3}}$ = $\mathbf{5,347345.10^{30}}$ **H** and exists ,

$\mathbf{E_{vK}}$ = h $\mathbf{f_v}$ = $6,62607.10^{-34}$J s.[ $5,347.10^{30}$] /($1,6022.10^{-19}$ eV) = $2,2114518.\mathbf{10^{14}}$eV

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

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

**2…**Electron , e , $m_e$ = 0 , 511MeV = 0, $511.10^{-5}$ eV . $[1,80. 10^{-27}]$ = $9,198.10^{-31}$ Kg

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

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

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

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

**Remarks** :

1.. Gravitational force → **σ** A ≡ $[\dfrac{2\pi rf}{\Phi}]$ A ≡ $\bar{v}$ $[\dfrac{A}{\Phi}]$ ≡ σ.Φ³ ≡ Φ² . [{σ Φ}] ≡

G ≡ Φ². [{σ Φ}≡ $2\pi f_P$ r ≡ w r ≡ $\bar{v}$ ≡ m g = $\bar{c}$ = $\dfrac{2.B}{\pi r^3}$] → i.e. **G** is related **To**

→ motion ≡ work W , Spaces r , Anti-Spaces 1/r , Stresses σ , Areas A , Caves a ,

→ Periods T , Frequencies f , Angular-waves w , Angular-Momentum B ,

→ Spin B ≡ S , velocities v , Light-velocity c , Impedances $Z_n$, Masses m ,

→ Gravity $\bar{g}$ , Charges , $\bar{q}$ , Electromagnetic – Fields , $\bar{E}$ , $\bar{M}$ , Hydrogen H ,

→ Atoms , Molecules , Golden-Ratio Φ , i.e. All-Universe . Markos 9/4/2020.

By Sweeping the Φ Surface through Stresses σ ≡ $[\dfrac{2\pi rf}{\Phi}]$ , and scanning frequencies f ,

**Explanation** :

**The Action-Spaces** ≡ The Infinite **Quaternion - monad**s → $\bar{z}$ ≡ ( s + $\bar{v}$.i ) ≡ $\overline{AB}$ ≡

≡ $\sqrt{s^2 + [\bar{v}.i]^2}$ , or $\bar{z}$ ≡ x + **i** . **y** ≡ $\overline{AB}$ ≡ moduli , r , is their magnitude

[ r = | r | = $\sqrt{x^2 + y^2}$ ] , on Unit-Diameter $\overline{AB}$ . The [**QMAS**] . For Quaternion |$\bar{v}$| = s

**Breakages** $\vec{z} * \bar{z}$ = (s + $\bar{v}$.i )² = s² +[$\bar{v}$]² +2.s$\bar{v}$.i = s² − $\bar{v}$ ² ± 2.s $\bar{v}$ = |s|² - |$\bar{s}$|² ± 2.|s|.|$\bar{s}$| , **i.e.**

**In Figure** -3- the **Vector of Amplitude** is Quaternion $\bar{z}$ ≡ x + **i . y** , with vector $\bar{z}$ , to

be from Definition of the **Complex Vector Space ,** the **Set of Vectors of length** (the **n**

Vertices which form the **n -** Polygon Sides , or the **Norm** of the Complex - Vectors )

a...The **4-Geometrical Spaces** , [ **Space , Anti-Space , Neutral-Space , Sub-Space** ]

consist → The **Geometrical - Mould** of $\overline{AB}$ - Monad ≡ [**PM-2R-M**] ←

b...The **Vectors of Amplitude z = 2R** , ON $\overline{AB}$ Monad , consist The **Energy-Mould** .

of **2R-Form .**The **Physical -Mechanisms** → [ **Physical Mould** of **2R- Monad** ] ≡

[**GM-AB-M**] ← are such and dependent on the **n - Number of Accessories** they use **.**

The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .

A… The **Gravity** Force **G** $\equiv$ motion $\equiv$ $\sigma.\Phi^3$ , **exists without mass and is Quantized**
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 **$\Phi$  *Golden-Ratio*** , exists as  *Impedance* **b**.

**Placing [ Physical Mould** of **2R- Monad ] <u>ON</u> [ Geometrical - Mould** of $\overline{AB}$ - **Monad ]**

[ **PM-2R-M** ]  $\rightarrow$  $\uparrow\downarrow$  $\leftarrow$  [ **GM-AB-M** ]

THEN $\rightarrow$ **Gravitational-Force G $\equiv$ [ $\Sigma$ = n . h ] ,** and **n-NA = 1 $\Rightarrow$ Creates & Constructs**,
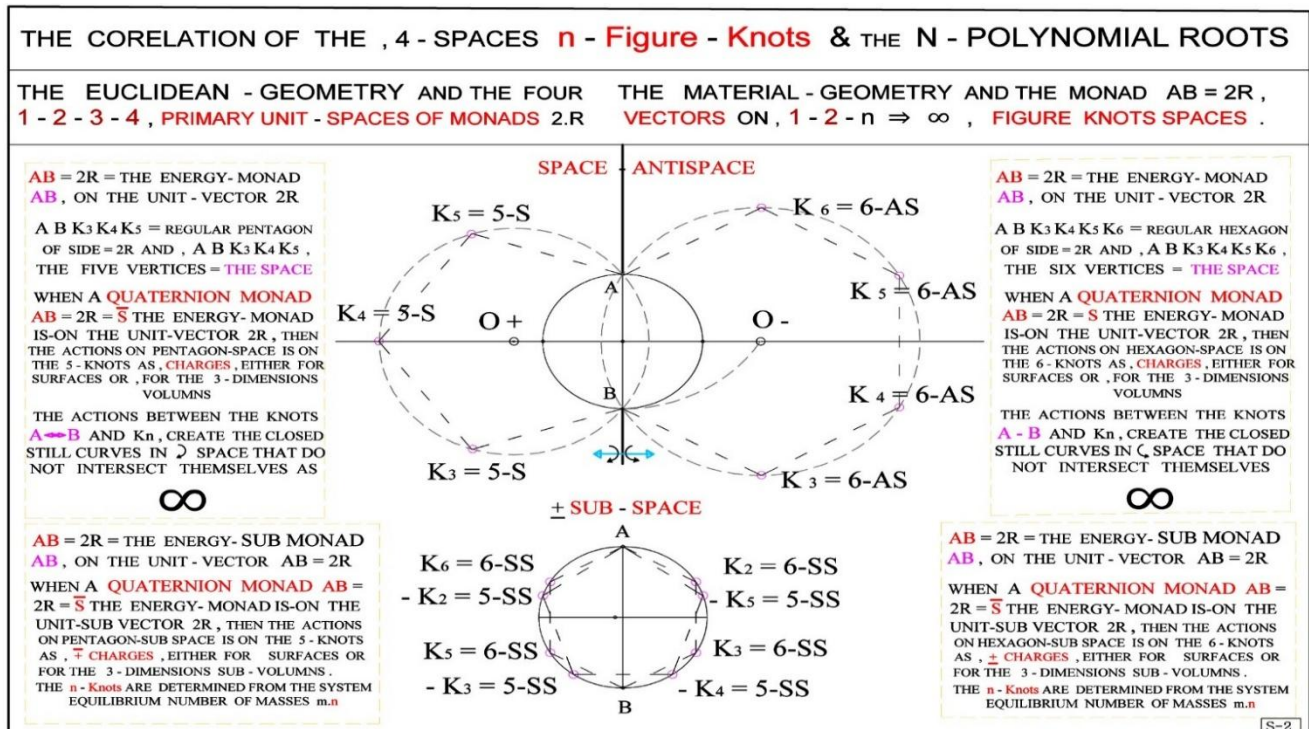


**Figure -28-** :  **On any Energy - Monad A $\leftrightarrow$ B**  , exist the 4-Primary Spaces which are
the Roots of the Nth Degree Polynomial , Becoming from the equation of  motion .

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118
The Fundamental Particles Origination - Mechanism in MFMF - PNS Caves .