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**< WITH A RULER AND A COMPASS >  
AS THE RESTRICTIVE BASE - BECAME A REALITY  
THE SOLUTION OF THE ANCIENT  
UNSOLVED GREEK PROBLEMS**

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### **Abstract**

**a...** The Unsolvability of the Three famous Ancient Greek Problems—Doubling the Cube, Trisecting the Angle, and Squaring the Circle -- **Stands on the Base justification** of the **Algebraic Field Theory (specifically GaloisTheory)** and the **Theory of Constructible Numbers**, which were developed in the 19th century.

**b...** The Greeks often used other **Techniques (like Conic sections or Mechanical tools)** to Solve these Problems, But **their self-imposed "Euclidean"** constraint, with a **Ruler and a Compass**, (straightedge and compass) made these Specific Problems impossible to solve.

**c...** In the Published Articles [123],[124],[126] , it is **clearly evident** that the Solution of the Ancient , Unsolved Greek Problems, using a **Ruler and a Compass** , as the constraint has been set by Euclid] , **Has Become Possible**, and is in the Critique of Both , **Human Logic Thinking and , The Artificial Intelligence** when it uses **The Path of Knowledge** to the Truths of Nature, and which is the **Dialectic Logic** of Euclidean Geometry .

**d...** From the Published Articles [123], [124], [126], All Steps Follow the Restrictions set by Euclid which are **< By A Ruler and a Compass >**

**In the New Article [125] the Proof is repeated, Both of the Squaring of the circle and the Doubling of the Cube using only a Ruler and a Compass, as well as the Bellow-motion of the Photon with The Photon`s Cloning Method.**

**1.. Quadrature.** [124] = Fig ,2-4

STEP-1  $\Rightarrow$  On CA Segment as diameter , is drawn the circle (E , EC = EA) from center E , **the CA with a Ruler and circle (E , EC= EA) with a Compass.**

STEP-2  $\Rightarrow$  On 2,AC Segment Draw circle (C , CP = CA) and from centers A , A' , Draw the circles (A , AA') , (A' = A'A) Intersected at Point P' , and Draw P'C Segment Intersecting the circle (C, CP ) at Point P where issues **CP  $\perp$  CA . With a Ruler Draw CP Segment as diameter , and from the center E' with a Compass the circle ( E' , E'C = E'P ) . Let Point O be the center of AP .**

STEP-3  $\Rightarrow$  From mid-Point O of the Hypotenuse AP as center , Draw the circle (O, OA= OP = OC) and **with a Ruler Complete the Squares , OCBA,OCB'P . On Perpendicular diameters OB , OB' and from Points B , B' Draw with a Compass  $\rightarrow$  The Conjugate ircles , (B, BE=EC) , (B' , B'E'=E'C) respectively intersecting the (E, EC) , (E' , E'P) circles at the Points **R , R'** , respectively,**

STEP-4  $\Rightarrow$  From Points R , R' , Draw **with a Ruler** the line Segment ,**R R'** ,which Intersects the Diameter **COC'** at Poind **G** , and **with a Compass** , **OG'= OG**

STEP-5  $\Rightarrow$  From Point P Draw **with a Ruler** the **PG'** line , intersecting the two circles ( O , OA ) , ( E' , E'P ) at Points **N , H** , respectively.

STEP-6  $\Rightarrow$  Draw **with a Ruler** the line NA so that its extension intersects the circle ( E , EA ) at Point M and Draw **with a Ruler** Segments CM , CH . and Complete Quadrilateral CMNH , [*which is The Circles - System* ] . Draw **with a Ruler** the line NP , so that its extension intersects the circle ( E' , E'P ) at Point N' , and Draw **with a Ruler** the Segments CM' , CH' and Complete Quadrilateral CM'N'H , [*which is The Anti circles – System* ] .

STEP-7  $\Rightarrow$  It was shown that , By using a Ruler and a Compass Only , **the Quadrilaterals CMNH , CM'N'H are Squares** and that , **CMNH = [CM]<sup>2</sup> =  $\pi$ .[EC]<sup>2</sup> & CM'N'H = [CM']<sup>2</sup> =  $\pi$ .[EC']<sup>2</sup> and from  $\pi . [EC]<sup>2</sup> \equiv CMNH = [CM]<sup>2</sup> then  $\pi \equiv \frac{CMNH}{(EC)^2} \dots o.e.d.$$**

STEP-8  $\Rightarrow$  For the Bellow-Motion and from Common Point R , the motion of circle ( E , EC ) Becomes from the Tangential velocity  $\vec{C}_T = \vec{c} = RO$  which Passes from Point O . The tangential velocity  $\vec{C}_T = RO$  on the circular Path is Balanced and Maintained by the Centripetal component  $\vec{C}_R$  . The Tangential velocity Vector  $\vec{C}_T = \vec{RO}$  is analyzed to the Horizontal and to the Vertical velocities  $\vec{V}_x , \vec{V}_y$  . From the Geometrical Asymmetry of circles [B,BE] , [O,OA] , the Birefringence of  $\vec{RO}$  in Axis CC' is the **Path at Point G'** for both  $\vec{V}_x , \vec{V}_y = \vec{RG}$  acting Perpendicularly so that (RG) = (R'G)  $\perp$  CC' . **Since GO = OG' motion is transferred at Point G' ,**

**OR**

**The Velocity Vector  $\vec{C}_T \equiv \vec{RO}$  Strikes at Point O , ACTS at Point G' , of the axis , within the Axis CC' , as  $\vec{V}_x$  , And Perpendicular , as  $\vec{V}_y$  , to This Axis with the Rotation Angle  $G' \hat{P} O = 2\pi / r^2$  radians  $\rightarrow C' \hat{P} O = 45^\circ$**

With the Bellow-Motion ,  $C' \hat{P} O = 45^\circ$  , Photon carries the **Herpolhode Energy =  $\vec{c} . \pi . [EC]<sup>2</sup>$**  into **Polhode Half-Circle Energy Store** , and into the **Anti-Polhode Half - Circle Energy Store** . **The Vector [  $\vec{V}_x = OG'$  ] = Polhode =  $\vec{c} . \pi . [EC]<sup>2</sup>$  , carries the Twisted Energy in axis COC' , and creates the **Bellow motion of****

the Axis , denoting the **Electric – Field E** .

The Vector  $[\vec{V}_y = G \cdot P] = \text{Anti-Polhode} = \bar{c} \cdot \pi \cdot [E \cdot C]^2$  , carries the **Pushed Energy on CM`N`H - Square** and creates the **Storage** , denoting the **Magnetic – Field M** , of the **Electromagnetic Waves E ,M** . and thus is Photon Electromagnetic-Waves , where  $E \perp M$  ,

**Feom-[124], Show that Quadrilaterals CMNH , CM`N`H` are Squares ,**  
and that  $CMNH = [CM]^2 = \pi \cdot [EC]^2$  &  $CM`N`H` = [CM`]^2 = \pi \cdot [EC`]^2$

THE - PROOF :

- a...Because the Point M is located on the circle (E , EC) of Diameter CA , therefore angle  $\widehat{CMA} = 90^\circ$  and  $CM \perp MA \perp MN$  .
- b...Because the Point N is located on the circle (O , OA) of Diameter AP , therefore angle  $\widehat{MNP} = 90^\circ$  and  $PN \perp NA \perp NM$  .
- c...Because the Point H is located on the circle (E` , E`C) of Diameter CP , therefore angle  $\widehat{CHP} = 90^\circ$  and since angle  $\widehat{CHN} = 180^\circ - 90^\circ = 90^\circ$  then  $NH \perp HC$  .
- d...Because on Quadrilateral CMNH , the angle  $\widehat{MCH} = 360^\circ - 270^\circ = 90^\circ$  , therefore Quadrilateral CMNH is an Orthogonal-Quadrilateral . Since also the Right-Triangles CMA , CHP on Equal Diameters CA , CP , have their Sides CM , CH Perpendicular each other are also Equals and Side  $CM = CH$  . **Since Quadrilateral CMNH is an Orthogonal - Quadrilateral with Equal Sides Therefore is SQUARE. .... o.e.δ.**

Conclusions :

- 1...Any Point M on arc of (E , EC) circle , between the Points , B , A , forms a Square CMNH on **The Circles** → **System** , and the Square , CM`N`H` , on **The-Idol** → **The Anti – System** Both on the → **2-Vectors , 3-Poles Rotating Squares Mechanism** ← Since squares CBAO , CAC`P , belong to circles (E , EC) , (O,OC = OA) , therefore This Mechanism carries the Area  $\pi \cdot [EC]^2$  of (E , EC) circle , to circle (O,OC = OA) . Since the inscribed circle to Square CAC`P is equal to the circle (E , EC) , therefore this Mechanism carries also all Properties of the circle from Point B to A . Since also square  $CAC`P = 2 \cdot CBAO$  , then  $\pi \cdot [OC]^2 = 2 \cdot \pi \cdot [EC]^2$  . **i.e. The Mechanism carries circle (E , EC) to circle (O,OC = OA) of Double Area .**
- 2...The Circles Anti-circles System are Equal and Placed Symmetrical on Common axis .
- 3...The Rolling of Point M on circle (E , EC) means Point M is moving on the arc having → Radius of Curvature  $ME \perp MT$  the Tangent ← at Point M .
- 4.. It was Proved [44] and from Analysis , that when Point B is Rolling on the circumference of circle (E,EC)–[ say **Point M** ] and MA line extended at Point N of circle (O,OC= OA) by Joining PN which intersects the circle (E` , E`C) at Point H , **Then** the formed Square CMNH is in the circle (O,OC = OA) .
- 5.. When Point M is **on Point B** , common to circle (E , EC) and to center of circle (B , BE) , BA line extended at Point A of circle (O,OC= OA) and Joining PA and intersecting the circle (E` , E`C) at Point O , The formed Square CBAO is the square in circle (E , EC). **Since the Conjugate circle (B , BE) is constant and Unmovable** and the Only motion is the Rotational-motion , **Therefore This circle (B , BE) carries the Properties of this circle** say the Area of circle  $\pi \cdot [EB]^2$  in the circle (E , EC) and issues  $\pi \cdot [EB]^2 = \pi \cdot [EC]^2$  .
- 6.. When Point M is **on Point R** , common to circles (E , EC) , (B , BE) , **Then**  $CR N_R H_R$  is also a Square in the circle (O,OC = OA) . This **Conjugate circle** carries the Properties of circle (B , BE) say ,**The Inscribed Square CBAO** which is equal to that of circle and the **Area of circle =  $\pi \cdot [EC]^2$**  in the circle (O,OC= OA), **But How ? ⇒ In-Reverse.← To Show that at Point R , , Common to circles (E , EC) , (B , BE) , , , , ⇒**

**The Conjugate circle (B , BE) , Stores its Properties to the Half of circle (O,OC= OA).**

Since OB is Diameter in circle (E , EO) and angle  $\widehat{BRO} = 90^\circ$  , therefore  $RB \perp RO$  .  
 At this Point R the Radius of Curvature **RB , is Perpendicular to AT-tangent  $\rightarrow RO$**   
 and Passes from Point O . Since Geometrical - **Vector RO** is analysed to  $RG \perp COC'$   
 and  $GO$  in  $COC'$  then the Right-Triangles  $GAO$  ,  $OG'P$  are Equal because their interior  
 alternate angles  $G\widehat{A}O = G'\widehat{P}O$  , and so exists  $OG = OG'$  .

By Extending  $PG'$  on circles (E', E'C) , (O,OC= OA) occupy the H , N , Points and  
 then Extending  $NA$  to M Point on (E , EC) circle , **Then CMNH is Square . i.e.**  
 The area of circle (B , BE)  $\equiv$  (E , EC) , is Transported to the Half of circle (O , OC), as

$$\pi \cdot [EC]^2 \equiv CMNH = [CM]^2 \quad \& \quad \pi \equiv \frac{CMNH}{(EC)^2} \quad \dots\dots\dots \text{o.e.}\delta.$$

7.. When Point M is **on Point A** , common to circles (E , EC) , (O , OC) , **Then CAC'P**  
 is also a Square in the circle (O,OC = OA) . **At this Point A** the Radius of Curvature  
**AE , is Perpendicular ( $\perp$ ) to AC'  $\rightarrow$  AT-tangent** , which Passes from Point C' , **i.e.**  
 The area of circle (B , BE)  $\equiv$  (E , EC) , is Transported to the Halve of circle (O , OC) .

8.. When we say that Point M is on the **Arc BA** of the circle (E , EC) , then according to the  
 Principles of Euclidean Geometry , this Point is considered to be **Without Position** , and  
 for a Straight-Line Segment , it is also **Without Direction** . This happens because in the  
 Euclidian Geometry Between any Two adjacent Points exist Infinite ,  $\infty$  , Points .  
**The Position is Specified** Only by their **Common Point R** , of intersection of the  
 Conjugate Circle (B , BE=EC) and (E , EC) , and **The Direction is Defined** by the  
 Tangent **RO** , of the Conjugate Circle at their Common Point R .

**This commitment Determines for us , The Unique Position of Common Point R of  
 that Square CMNH on arc BA , which Area is Equal to that of the circle ( E , EC ) .**

**The exact Numeric Magnitude of number ,  $\pi$**  , may be found only by numeric  
 calculations.[44] . All magnitudes exist on the **< Plane Formation Mechanism of  
 the first dimensional unit AC >** as geometrical elements consisting , **the Steady Formulation** ,  
 (The Plane System of the Isosceles Right-angle triangle ACP with the three Circles on the sides  
 ) and **the moving and Changeable Formulation of the twin , System-Image** , (This Plane  
 Perpendicular System of Squares , Anti-squares is such that , *the Work Produced in a between  
 closed area to be equal to zero* ) .

Starting from this logic of correlation upon Unit , we can control *Resemblance Ratio* and  
 construct all the Regular Polygons on the unit Circle as this is shown in the case of squares .  
 On this **System** of these three circles [124]-F.2 ( The Plane Procedure Mechanism which is a  
 Constant System ) is created also , a *continues* and , an *Ucontinues* Symmetrical Formation ,  
 the changeable System of the Regular Polygons , and  
 their **Image** ( Changeable System of Regular anti-Polygons ) the **Idol** , as much  
 this in **Space** and also in **Time** , and was proved that in this Constant System  
*the Rectilinear motion of the Changeable Formation is Transformed into a  
 twin and Symmetrically axial-centrifugal Pole rotation (this is the motion on System).*

The conservation of the Total Impulse and Momentum , as well as the conservation of the  
 Total Energy in this Constant System with all properties included , exists in this Empty Space  
 of the un-dimensional Point Unit mechanism.

All the forgoing referred can be shown ( maybe Presented ) with a Ruler and a Compass , or  
 can be seen , live , on any Personal Computer , on Dr.Geo machine .

The theorem of *Hermit-Lindeman* that number ,  $\pi$  , is not Algebraic , is based on the theory of  
 Constructible numbers and number fields ( *on Number Analysis* ) and Not on the **< Euclidean  
 Geometrical Origin-Euclid-Logic on Unit Elements Basis >**

The mathematical reasoning (*the Method*) is based on the Restrictions imposed to seek the  
 solution **< i.e. with a Ruler and a Compass >** .

By extending Euclid logic of Units on the Unit circle *to unknown and now Proved Geometrical unit elements*, thus the settled age-old question for the unsolved Problems is now approached and continuously standing solved. All Mathematical interpretation and the Relative Philosophical reflections based on the theory of the Non-Solvability must Properly Revised. ( markos 30/10/2015 )

**Application in Physics :**

From math theory of Elasticity , Cauchy equations of **Stresses** in three Dimensions are ,

$$\frac{\partial \sigma_x}{\partial x} + \frac{\partial \tau_{yx}}{\partial y} + \frac{\partial \tau_{zx}}{\partial z} + X = 0, \frac{\partial \tau_{xy}}{\partial x} + \frac{\partial \sigma_y}{\partial y} + \frac{\partial \tau_{xy}}{\partial z} + Y = 0, \frac{\partial \tau_{xz}}{\partial x} + \frac{\partial \tau_{yz}}{\partial y} + \frac{\partial \sigma_z}{\partial z} + Z = 0$$

$\sigma_x, \sigma_y, \sigma_z$  = The Principal stresses in  $x, y, z$  Axis ,  
 $\tau_{xy}, \tau_{xz}, \tau_{yz}$  = The Shear-stresses in  $xy, xz, yz$  Plane,

$X, Y, Z$  = The components of external forces and of **Strain** ,  $\frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = 0, \frac{\partial}{\partial x} \frac{\partial v}{\partial y} = 0$

and  $\frac{\partial}{\partial x} \frac{\partial w}{\partial z} = 0$  where  $u = u(y, z) \rightarrow$  are the Deformation components,  
*the displacements* in  $y, z$  axis .

$v = c \times z$  = The Rotation on  $z$ , axis

$w = -c \times y$  = Anti-rotation in  $y$ , axis .

Applying above equations on an orthogonal section of a solid , then exist the differential equations of equilibrium , and for the Boundary conditions is found that , the Stress function is satisfying the equations ,  $\frac{\partial \tau_{yx}}{\partial y} + \frac{\partial \tau_{zx}}{\partial z} = \frac{\partial \gamma_{yx}}{\partial y} + \frac{\partial \gamma_{zx}}{\partial z} = \frac{\partial^2 u}{\partial y^2} + \frac{\partial}{\partial x} \frac{\partial v}{\partial y} + \frac{\partial^2 u}{\partial z^2} + \frac{\partial}{\partial x} \frac{\partial w}{\partial z} = 0 \dots (1)$  and the Boundary conditions on Solid's surface ,

$$\frac{\partial u}{\partial y} dz - \frac{\partial u}{\partial z} dy + y \cdot dy + z \cdot dz = 0 \dots (2)$$

where ,  $\gamma_{xy}, \gamma_{xz}, \gamma_{yz}$  = the Slip components where is ,  
 $\gamma_{xy} = \frac{\partial u}{\partial y} + \frac{\partial v}{\partial x}$  . Equations show that the Resultant Shear-stress at the Boundary is directed along

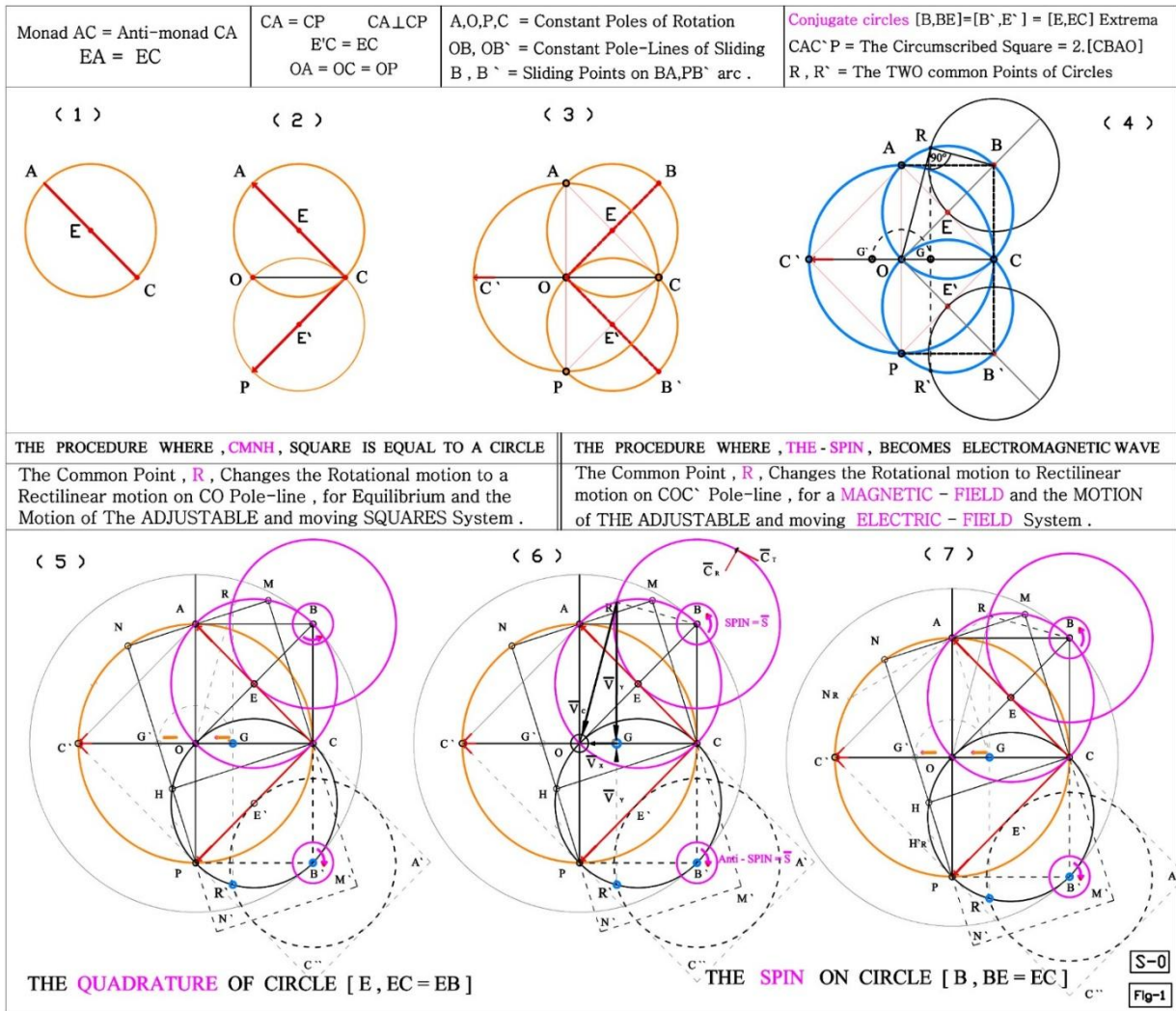
the Tangent to the Boundary and that , the Stress function  $u = u(yz)$  must be Constant along the Boundary of the cross section . **i.e. each cross section on  $x$ , axis is Rotated as a Disk in its Plane** , from which Points follow relation  $u = u(yz)$  and since Stress function are constant , then from equation (2)  $y \cdot dy + z \cdot dz = 0$  , or  $y^2 + z^2 = \text{constant}$  meaning that , **A Cross-section under Stress Stays Plane only in Circle circumference , or a Plane Space , under ENERGY Stress , remains**

**Flat only when the Plane Becomes a circle , i.e .** The Photon carries the **Herpolhode** Energy =  $\bar{c} \cdot \pi \cdot [EC]^2$  of the **Conjugate-circle**  $\equiv (B, BE=EC)$  into the **Polhode** Half-Circle Energy Store , and into the **Anti-Polhode** Half - Circle Energy Store . **Thus Photon follows the Plane - Mould – Mechanism which is the Squaring of the Herpolhode - circle.**

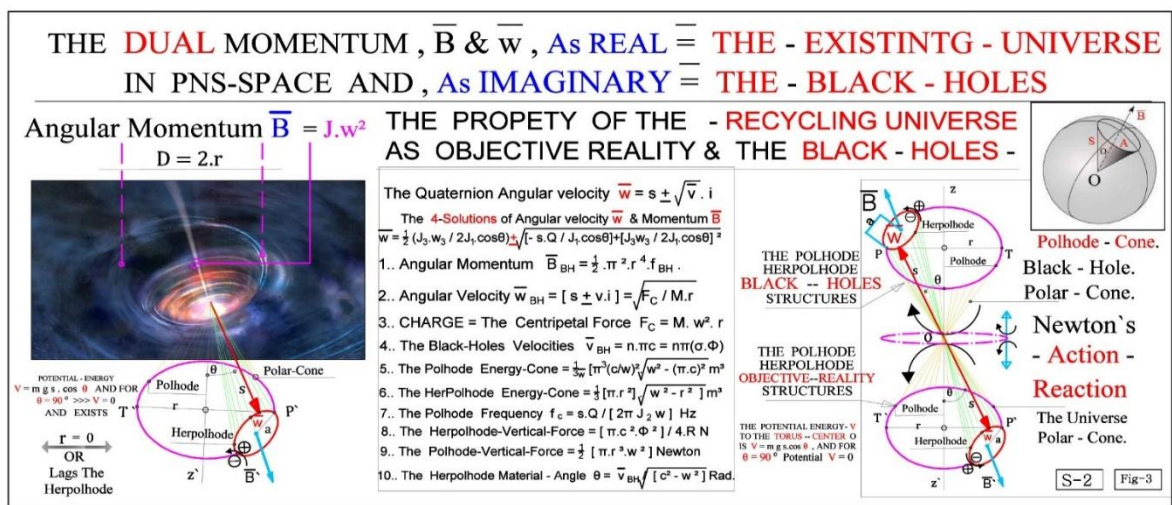
The same is seen in Laplace's equation  $\frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} \equiv \nabla^2 u = 0$  which is termed a Harmonic function.

Placing  $\nabla^2 u = 0$  in Both Parts of the equation of the circle , becomes Identity and  $\nabla^2 u \cdot (y^2 + z^2) = \nabla^2 u \cdot (c)$ , **or any Monad = Quaternion , consisted of the Real Part the Plane Space , and under Energy Stress the Imaginary Part  $\equiv$  the Herpolhode Energy =  $\bar{c} \cdot \pi \cdot [EC]^2$  , remains in Flat only when the Plane Becomes a circle , i.e. The Energy-Space discrete continuum follows the Extrema E-geometry Mould ,  $\pi$  , which is the Squaring of the Herpolhode - circle.** If Potential Energy is zero then Vector  $\bar{r}$  is on the Surface indicating the conjugate function. [49].

**In Electricity** , when an Electric current flows through a Conductor , then a Transverse circular Electromagnetic field is Produced around itself which follows the Vectors-cross-Product Plane **Mould – Mechanism which is the Squaring of the Herpolhode-circle** ,  $\pi \cdot |H|^2$ . ( markos 20 / 05 / 2026 )



**Figure -2-** The Steps for Squaring the circles ( E , EC = EA = EO = EB ), and ( E' , E'C = E'P = E'B' = E'O ), Through Geometric - Requirements , Using < A Ruler and A Compass > as this was first Posed by the Ancient Greeks .



**Figure-4-** The Total Energy  $2 \cdot E = \text{Spin} = \vec{S} = \vec{w} \cdot \vec{B}$ .  $\vec{B} = \frac{\vec{c}}{r} \cdot \vec{B} = \vec{c} \left| \frac{\vec{B}}{r} \right|$ , and  $\vec{c} = \vec{c}_P = \left| \frac{2 \cdot r \cdot \vec{E}}{\vec{B}} \right|$   
The Velocity of Photon  $\vec{c}_P$  is analyzed to Centripetal  $\vec{c}_K \equiv \vec{RB}$ , Tangential  $\vec{c}_T \equiv \vec{RO}$

**2.. Duplication.** [126] = Fig ,1-2-3

STEP-1  $\Rightarrow$  On CA Segment as diameter Draw **with a Compass** circle (B',B'C=B'A) and circle (C, CB'=CP') where P' is the Point of Intersection of AC Produced **with a Ruler** . and from centers B', P', Draw **with a Compass** the two circles (B',B'P') and (P',P'B') Intersected at Point C', and Draw **with a Ruler** C'C Segment Intersecting circle (C, CB') at Point B where issues **CB  $\perp$  CA = 2.CB**

STEP-2  $\Rightarrow$  On AB Hypotenuse Segment Draw **with a Compass** the circle (O,OC=OA=OB), from Mid-Point O and from Point C, Draw (C,CA=CD'=CP').

STEP-3  $\Rightarrow$  Form **with a Ruler** and on Straight line BP', the Diameter BA'=BA and Draw **with a Compass** the circle (O',O'B = O'A'), and Draw also Arc AP of the circle (A', A'A = A'P'), where Point P lies on line BP'.

STEP-4  $\Rightarrow$  Draw **with a Compass** the circle (K, KB = KP), from the Mid-Point K of the Line-Sector BP, which intersects the line AD' Produced at Point D. Draw **with a Ruler** line DB intersecting the circle (O, OB) at Point E, and Draw the Diameter EE'. of the circle (O, OB).

STEP-5  $\Rightarrow$  Complete **with a Ruler** the Quadrilaterals PAED, PE'BD.

STEP-6  $\Rightarrow$  It was shown that, By using a Ruler and a Compass Only, that Quadrilaterals PAED, PE'BD are Rectangular Parallelograms, and On the Right-angled Triangles PAD & PBD, valids  $[CD]^3 = 2.[CP]^3$ .

STEP-7  $\Rightarrow$  For Photon's SPIN Vector equal to  $\bar{X} = OG'$ , and By using a Ruler and a Compass Only, is found a Cloning Vector Z, such that  $\rightarrow |Z|^3 = 2. |X|^3$ .  $\leftarrow$  Fig- 2, 3-

STEP-8  $\Rightarrow$  FORM ON  $\Rightarrow$  { The 2-Vectors, 3-Poles Rotating Squares Mechanism }, of the Equal Vectors, By using a Ruler and a Compass Only, The UNID Monad [CMNH]<sup>2</sup> equal to [CM]<sup>2</sup> and equal to Energy-Circle =  $\pi.[CA/2]^2$ , and ON The UNIT – VELOCITY – VECTOR  $\rightarrow$  {  $\bar{V}_x$  Vector  $\equiv$  Square CMNH  $\equiv \pi.[CA/2]^2 = [CP]^2 \equiv \pi.[CA/2]^2$  }  $\leftarrow$  & FORM The 2-Right Triangles, PAD, PBD, from { The 2-Vectors, 2-Poles Rotating Squares Mechanism }, On where valids the Duplication on the Unequal Vectors and The CUBES  $[CP]^3 = 2.[CD]^3$ , AND PLACE the Velocity-Vector  $|\bar{V}_x| \equiv$  Vector X, IN CP and DEFINE the Vector |Z|. where For Vector |Z| valids  $\rightarrow |Z|^3 = 2. |X|^3$   $\leftarrow$  and This is, The Quantum-Cloning of Photons.

**From-[126], THE PROOF :**

- a).. The Point E of the circle (O, OA) forms the Right Angle AEB, because it lies on the diameter BA, of the circle. The angle AED =  $180^\circ - 90^\circ = 90^\circ$ ,
- b).. Angle EDP =  $90^\circ$  because it lies on the diameter BP of the circle (K, KB = KP), Therefore the Angle PE'B =  $90^\circ$  is lying on the same diameter BP of the circle.
- c).. Because in the Quadrilateral PE'BD, the 3-angles, PE'B = E'BD = BDP =  $90^\circ$ , Therefore the Quadrilateral PE'BD of the circle (K, KB), is also a Rectangular Parallelogram, and thus line Segment PB' Passes through Point A.

- d).. It was Proved that the Angles  $\widehat{AED} = \widehat{EDP} = \widehat{DPE} = 90^\circ$  , Because they lie on the diameter **BP** of the circle (**K ,KB = KP**) , **Therefore** the Line **ED** is **Parallel** to **PE** .
- e).. Because the angle  $\widehat{EDP} = 90^\circ$  and on the diameter **EP** of the circle , and Because the angle  $\widehat{PAE}$  lies on the same diameter **EP** of the circle , **Therefore** angle  $\widehat{PAE} = 90^\circ$  .
- f).. Since for the angles it holds that  $\widehat{PAE} = \widehat{PEB} = 90^\circ$  ,Therefore the Rectangle **PAED** is Inside of **PEBD** , and Point **A** lies on **PE** .
- g).. On the Right Triangles **PAD** , **PBD** it is true , 1).. $[CP]^2 = CA.CD$  and 2).. $[CD]^2 = CP.CD$  , Dividing we have  $\frac{[CD]^2}{[CP]^2} = \frac{CP.CD}{CA.CD}$  , and then after an Order  $\frac{[CD]^3}{[CP]^3} = \frac{CD}{CA} = 2$  .

h)..**The Method** Is Based on the **Theory of Parallels** , and is , [Thalis], (Figure-3-)  
 Let **X** , a Line Segment Placed on the Perpendicular , **CP**, and , **A<sub>x</sub>** , **D<sub>z</sub>** Be the Sections of the Parallels , **P<sub>xy</sub> - A<sub>x</sub>** , **P<sub>xy</sub> - D<sub>z</sub>** , to which , **PA** , **PD** , respectively.  
 In Similar Triangles , **CPD** , **CP<sub>xz</sub> D<sub>z</sub>** , The Ratios apply , ( $\frac{C.D_z}{CD} = \frac{C.P_{xz}}{CP} = \frac{Z}{CD} = \frac{X}{CP}$ )  
 and by Rearranging the Terms  $\frac{Z}{X} = \frac{CD}{CP}$  -(h)- Since On the Mechanism **ACDP**, it holds

$$\frac{[X]^3}{[Z]^3} = 2 , \text{ Therefore for -(h)- it holds also } \rightarrow \frac{[X]^3}{[Z]^3} = 2 \leftarrow , \text{ That is } , , , , ,$$

**On the Mechanism , ACDP , The Straight line-Vector Z Has been found such that , The Cube of Z is Double that of X ..... o.ε.δ.**

Observation :

When the Obtained Point of **Application** , POSITION , of the Straight Segment **X** , is any POINT , then according to the Principles of Euclidean Geometry it is considered without **Position Magnitude** and **Direction** , This Geometric Indefiniteness of the Continuity of Points on Straight Line EXCLUDES at the Common Point **C** , of the 2-Segments , **X** , **Z** , and the **Direction** of this is **That , of the Maximum Perpendicular of the Mechanism PABD** of the Triangles , **PAD** & **PBD** .[Fig-2-]

### **Feom-[126] , THE MECHANICAL - METHOD FOR THE CLONING OF PHOTONS**

THE - STEPS :

- 1.. **Let** the Photon`s **SPIN Vector** , Be equal to  $\bar{X} = OG$  , and to find a Cloning Vector **Z** , **such that**  $\rightarrow |Z|^3 = 2 . |X|^3 . \leftarrow$  **Fig-2 , 3-**
- 2.. **See Proof in [123] WHERE** on the **2-Vectors , 3-Poles Rotating Squares Mechanism** , A Point **M** on **Arc - BA** is Rolling on the circumference of circle (E,EC) , and the MA line extended at Point **N** of circle (O,OC= OA) by Joining PN , which intersects the circle E`E`C at Point **H** , **Then** the formed **Square CMNH** is in circle |O,OC= OA| **AND WHEN SPIN**  $\equiv \tilde{B}$  of **Photons** is on **Mechanism** at the constant Point **B** , then its **Herpolhode** is the Circle [B , BE] and **Polhode** is the circle [O , OA] , where on B Point the motion is only the Spinn  $\equiv \tilde{B} \equiv \bar{c} . \pi . [EC]^2$  . This Quantity of Energy in **Herpolhode** Energy-circle is Stored in the [O , OA] Half -Part circle as **UNIT** Quantity =  $\pi . [EC]^2$  of the **Total Energy** , which is The Curl-motion  $\equiv \bar{c} . 2\pi . [EC]^2$  .
- 3.. **See Proof** , for the Rolling of Point **B** on (E, EC) circle meaning  $\rightarrow$  Radius of Curvature **BE**  $\perp$  **BA**  $\leftarrow$  tangent , where  $\overrightarrow{C_R}$  ,  $\overrightarrow{C_T}$  , are the two constitutes of light velocity vector  $\bar{c}$  .  
**i.e.**  $\bar{c} = \tilde{B} / \pi . [EC]^2$  ,  $\bar{c}_p = \left| \frac{2.r.\tilde{E}}{B} \right|$  & **The circle** (B , BE) carries the motion  $\bar{c} . \pi . [EB]^2$  in the circle ( E , EC) , where from relation  $|\overrightarrow{C_R}| \equiv \sigma . \Phi$  issues  $\Rightarrow \bar{c} . \pi . [EC]^2 \equiv \bar{c} . \pi . [EB]^2$  .

- 4.. See the Proof ,where **To Transfer** the Properties of Herpolhode , of the Conjugate circle (B,BE) to the circle ( E , EC ) , is required the existence of at least **One Common Point** Between them , **The Position also** is by their **Common Point R** , of intersection of the Conjugate Circle (B,BE=EC) and (E,EC) , **And Direction is Defined** by the Tangential Velocity  $\vec{C}_T \equiv \text{Tangent RO}$  , of the Conjugate Circle at Common Point R .
- 5.. See the Proof , that **When SPIN**  $\equiv \vec{B}$  of **Photons** is on Common- Point **R** ,the Tangential Velocity  $\vec{C}_T$  **Passes** from Center O , is Analyzed into Components  $\vec{V}_x, \vec{V}_y$  is **ACTING** at Point **G`** , Forming The **UNIT Square CMNH** =  $[\text{CM}]^2$  AND Equal to Energy-Circle =  $\pi \cdot [\text{CA}/2]^2$  . **THE**  $\vec{V}_x$  , Component **ACTS** at Point **G`** , **Tortionally** through Poles A ,O , **Forming ON** The **MOULD** of The 2-Right Triangles , **PAD , PBD**  $\rightarrow$  **The Mechanism of Dublication**  $[\text{CP}]^3 = 2 \cdot [\text{CD}]^3 \leftarrow$  Where The  $\vec{V}_x$  Vector  $\equiv$  Square CMNH  $\equiv \pi \cdot [\text{CA}/2]^2 = [\text{CP}]^2$  , which **PUSHES** the  $\vec{V}_x$  Vector-Energy **INTO** The CUBE  $[\text{CP}]^3 = |\vec{V}_x|^3$  ,
- 6.. **FORM ON**  $\Rightarrow$  { The 2-Vectors , 3-Poles Rotating Squares **Mechanism** } , of the Equal Vectors , **The UNID Monad**  $[\text{CMNH}]^2$  equal to  $[\text{CM}]^2$  and equal to Energy-Circle =  $\pi \cdot [\text{CA}/2]^2$  , and **ON** The **UNIT – VELOCITY – VECTOR**  $\rightarrow$  {  $\vec{V}_x$  Vector  $\equiv$  Square CMNH  $\equiv \pi \cdot [\text{CA}/2]^2 = [\text{CP}]^2 \equiv \pi \cdot [\text{CA}/2]^2$  }  $\leftarrow$   
**FORM** The 2-Right Triangles , **PAD , PBD** , from { The 2-Vectors , 2-Poles Rotating Squares **Mechanism** } , On where valids the Dublication on the Unequal Vectors and The CUBES  $[\text{CP}]^3 = 2 \cdot [\text{CD}]^3$  , **AND PLACE** the Velocity-Vector  $|\vec{V}_x| \equiv \text{Vector X}$  , IN **CP** and **DEFINE** the Vector  $|\text{Z}|$  .

For Vector  $|\text{Z}|$  valids  $\rightarrow |\text{Z}|^3 = 2 \cdot |\text{X}|^3 \leftarrow$  and This is Done ,

The Quantum-Cloning of Photons.

- 7.. **When the Electric-Field E** , of **Photons** is on Common- Point **R** , The Tangential-Velocity  $\vec{C}_T$  **Passes** from Center O , is Analyzed into Components  $\vec{V}_x, \vec{V}_y$  and **ACTS** at Point **G`** , forming The **UNIT Square CMNH** =  $[\text{CM}]^2$  and which is Equal to the Energy - Circle =  $\pi \cdot [\text{CA}/2]^2$  .  
**THE**  $\vec{V}_x$  , Component **ACTS** at Point , **G`** **Tortionally** through the 2-Poles A , O , and **Forms ON** The **MOULD** of The 2-Right Triangles **PAD , PBD**  $\rightarrow$  **The Mechanism of Dublication**  $[\text{CP}]^3 = 2 \cdot [\text{CD}]^3 \leftarrow$  Where The  $\vec{V}_x$  Vector  $\equiv$  Square CMNH  $\equiv \pi \cdot [\text{CA}/2]^2 = [\text{CP}/2]^2$  , **PUSHES** the  $\vec{V}_x$  Vector-Energy **INTO** The CUBE ,  $[\text{CP}]^3 = |\vec{V}_x|^3$  ,  
**i.e.**

The Velocity-Vector ,  $|\vec{V}_x|$  , IS Placed on **CG` Direction** through Point **G`** , and **ACTS** Rotationally By Polarization  $\equiv$  **Spinning**  $\equiv$  **Tortionally Curled** through the O ,A **2-Poles**. and **FORMS**  $\rightarrow$  **The Mechanism of Dublication**  $\leftarrow$  On which The **UNIT Energy-Square**  $[\text{CMNH}] = |\vec{V}_x|^3 = [\text{CP}]^3$  .. On This Mechanism the Unit Energy is Doubled , and this from the Energy-Curl-motion of Cube  $[\text{CP}]^3$  &  $\rightarrow [\text{CD}]^3 = 2 \cdot [\text{CP}]^3 \leftarrow$

**AND THUS IS DONE ,**

**THE QUANTUM CLONING MOULD OF PHOTONS ..... o.e.d.**

This Problem follows the three Dimensional , **Dialectic logic of Ancient Greek** , Αναξίμανδρος, [« τό μή Ον , Ον γίνεσθαι » The Non-existent Exists when is done , [6-13]

[ The Non - existent Becomes and never is ] , where **the Geometrical magnitudes**, have a **linear relation** (the continuous Analogy on Segments ) **in all Spaces as , in one in two in three dimensions , as this happens to the Compatible Coordinate Systems .**

The Structure of Euclidean Geometry is such [6] that it is a Compact Logic where **Non - Existent** is found everywhere , and **Existence** , *monads* ,is found and is done everywhere . In Euclidean geometry Points do not exist , but their Position and correlation is doing geometry The Universe cannot be created , Because it is continuously becoming and never is [9]

According to Euclidean Geometry ,and since the Position of Points (*empty Space*) creates the geometry and Spaces , Zenon Paradox is the first concept of Quantization . [15]

In terms of Mechanics , Spaces Mould happen through ,*Mould of Doubling the Cube* , where for any monad  $ds = CA$  and analogous to  $CD$  , the Volume or The cube of segment  $CD$  is the double the volume of  $CA$  cube , or monad  $CD^3 = 2.CA^3$  . This is one of the basic Geometrical Euclidean Geometry Moulds , which create the METERS of monads which  $\rightarrow$  **Linear** is the Segment  $ds = CAx$  , **Plane** is , $\pi$ , the square  $CMNH$  equal to the circle , and in **Space** is  $\sqrt[3]{2}$  the volume  $CD^3$  , in all Spaces , Anti-spaces and Sub -spaces of monads  $\leftarrow$  i.e. The Expanding square  $AxExDzPxz$  is Quantized to AEDP Rectangle by Translation to Point D , and by Rotation through point B , (the Pole of rotation) . The Constructing relation between any segments X , Y is  $\rightarrow (CP)^3 = (CD)^3 . (BA / BE)$  as in F.2

### Application in Physics :

The Electromagnetic waves are able to transmit Energy through a Vacuum (*empty space*) by storing their Energy Vector in an Standing Transverse Electromagnetic Dipole wave , and so considered completely Particle like , and in the transverse interference pattern to be considered as completely Wave , so the Same Quantity of Energy is as Intensity ,

**Energy**  $I_d = \frac{\rho\pi^2c^3}{2\lambda^2}[\epsilon E^2 + \mu H^2]$  in volume  $V = [\frac{4(w^2r^2)^3}{3\pi}]$  having mass  $\rightarrow$  **Particle Energy**

$I_d = (\frac{\rho.c}{2}).(wA_o)^2$  in Interference Pattern as  $\rightarrow$  **Wave**

This is the Wave-Particle duality unifying the classical Electromagnetic field and the Quantum Particle of light .Angular momentum of particles is  $\rightarrow$  Spin  $= \frac{E}{w} = [\pm\bar{v}.s^2] / w = (r.s^2) = w^2r^3 = [wr]^3$  and , as Spin  $= \frac{h}{\pi} = 2.[wr]^3$  , or **Energy Space quantity**  $wr$  ,

**is doubled and becomes the Space quantity**  $\frac{h}{\pi} = 2.[wr]^3$  ,

The above relation of Spin shows the deep relation between Mechanics and Egeometry , where in the tiny **Gravity-cave** of  $r = 10^{-62}$  m , the Energy -Volume-quantity  $[wr]$  in cave , **is Doubled and is Quantized in Planck`s - cave Space quantity** as ,  $(\frac{h}{\pi}) = \text{Spin} = 2.[wr]^3$  in  $r = 10^{-35}$  m i.e.

The Energy Space quantity ,  $wr$  , is Quantized , and Becomes the New Space quantity ,  $h / \pi = 2.[wr]^3$  , **Doubled** , following the Euclidean Space-mould of *Duplication of the Cube by changing frequency* , in tiny Sphere volume  $V = (4\pi/3).[wr/2]^3$  . Also ,

Since  $w = E / [h/2\pi] = m.c^2 / [h/2\pi] = 2\pi.mc^2 / h = 2r.s^2 = 4.r^3.w^2$  , since  $s = 2wr$  , then the mass  $m = 2 \frac{(wr)^3}{c^2} = \frac{2}{c^2} (wr)^3$  , is Doubled as above with Space-mould and , **is what is called**

**conversion factor mass** , **m** , and it is an Index of the Energy Changes .

**All Energy magnitudes from** ,  $0 \rightarrow \infty$  , **Deposit in the same Space** , *Resonance* ,

**By changing frequency** . The Conservation of Energy in Caves and in Atoms Compounds have been widely Analyzed and Proofed in Prior Articles [106],[118] , where in Mechanics and Physics is generally followed the Theory of Vibrations for Actions. [127]

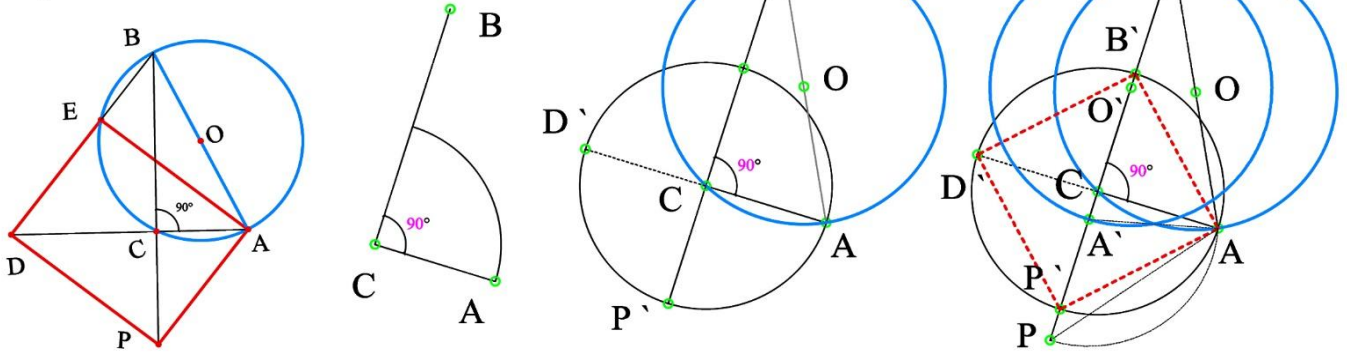
# THE DUBLICATION OF THE CUBE ON TWO VECTORS

VECTOR,  $CA \perp CB$  ,  
&  $CB = 2.CA$  ,  
or  $CB / CA = 2$  .

DRAW HYPOTENUSE  $AB$  , OF  
**CON-CIRCLE**  $\{O, OC = OA\}$  & DRAW  
THE CIRCLE  $\{C, CA=CP'=CD'\}$  WITH  
THE DIAMETER  $AD' = CB = 2.CA$  .

DRAW ON  $CB$ , THE EQUAL **CON-CIRCLE**,  
 $\{O', O'A' = O'B'\}$  , COMPLETE SQUARE  
 $[AB'D'P']$  & FORM THE NEW POSITION  
OF POINT  $P'$  AT  $P$  , WHERE  $A'A = A'P$

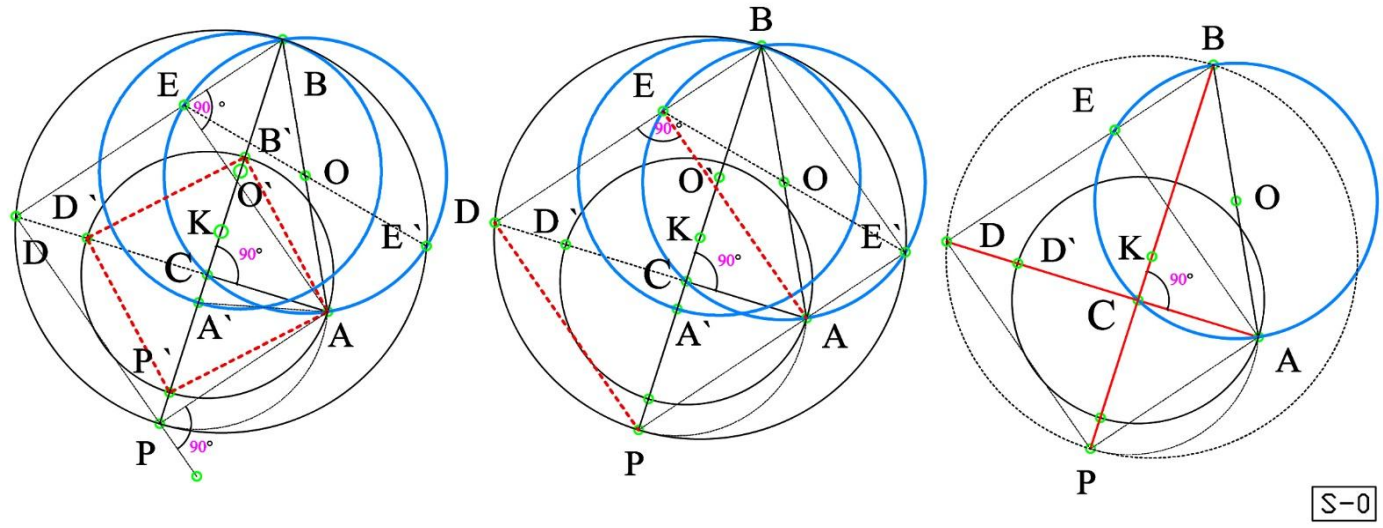
$$[DC]^3 / [PC]^3 = CB / CA = 2$$



DRAW THE CIRCLE  $\{K, KB=KP\}$  ON DIAMETER  $BP$  , WHICH INTERSECTS THE LINE  $AD'$  AT POINT  $D$  , AND DRAW LINE  $DB$  INTERSECTING THE CIRCLE  $\{O, OB\}$  . AT POINT  $E$  . FORM THE DIAMETER  $EOE'$  OF CIRCLE  $\{O, OA\}$  & COMPLETE THE TWO FOUR-SIDED ,  $PAED$  ,  $PE'BD$  .

SINCE  $PD \perp PA$  &  $AE \perp EB$  . SO  
ANGLE  $\{APD = AEB = AED = 90^\circ\}$   
& SINCE LIE ON DIAMETER ,  $AD$  ,  
OF CIRCLE  $\{C, CA=CD=CP=CE\}$   
THEN  $PAED$  ,  $PE'BD$  ARE  
**RECTANGULAR-PARALLELOGRAM**

THE QUICK-PROOF :  
1..ON RIGHT-ANGLED TRIANGLES ,  $PAD$  &  $PBD$  ,  
ISSUES  $[PC]^2 = [CA.CD]$  &  $[DC]^2 = [CP.CB]$   
2..BY-DIVISION  $[DC]^2 / [PC]^2 = [CP.CB / CA.CD]$   
And  $[DC]^3 / [PC]^3 = CB / CA = 2$  ..... **OEδ**.



S-0

Figure-1-

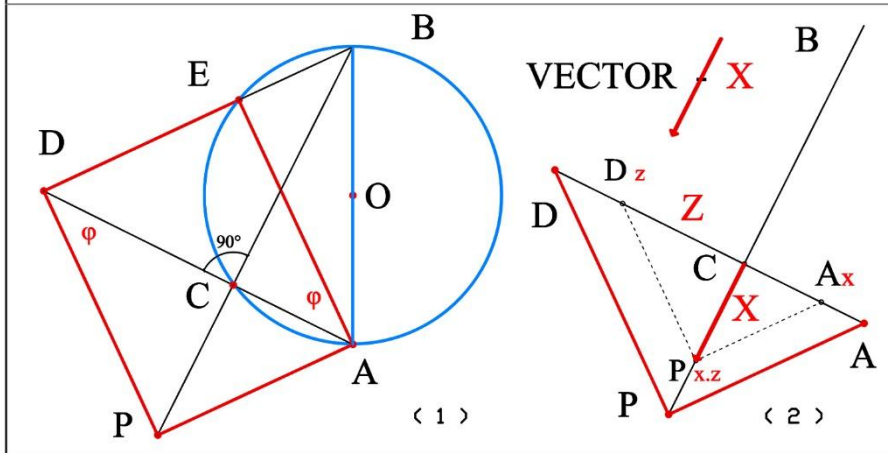
The , 2-Vectors 2-Poles Rotating Rectangular Mechanism . where ,The Straight line Segment ,  $CB = 2.CA$  , and  $CB \perp CA$  , and the circles  $(O, OC = \frac{AB}{2})$  .  $(O', O'B = \frac{AB}{2})$  ,  
On the Two Equal Diameters  $BA = BA'$  , of the Equal Hypotenuses ,  $BA$  ,  $BA'$  , and the 2-Poles at the Points  $A$  ,  $B$  , valids on Triangles  $PAD$  &  $PBD$  Mechanism , which is  $[CD]^3 = 2.[CP]^3$  .  
For any Vector  $X$  Placed on  $CP$  , is found on Direction  $CD$  through Point  $C$  . Vector  $Y$  .

# THE MOULD FOR **DUBLICATION OF THE CUBE** $[CD]^3 = 2..[CP]^3$

VECTOR,  $CA \perp CB$  ,  
&  $CB = 2.CA$  ,  
or  $CB / CA = 2$  ,

ANY VECTOR,  $X$ , FORMING THE ANGLE,  $\phi$ , ON  
DA-LINE-VECTOR, IS TRANSPORTED ON THE  
2-VECTORS 2-POLES, MOULD AND MEASURED

1..ON RIGHT-ANGLED TRIANGLES,  $PAD$  &  $PBD$ ,  
ISSUES  $[PC] \approx [CA.CD]$  &  $[DC] \approx [CP.CB]$   
2..BY-DIVISION  $[DC]^{1/2} / [PC] \approx [CP.CB / CA.CD]$



CUBES UNID-MONAD MOULD

ON TRIANGLE  $PAD$  AND  
 $P_{xz}AxD_z$  ISSUES  $Z/CD = X/CP$ ,  
OR  $Z : X = CD : CP$   
SINCE  $[CD]^3 = 2..[CP]^3$  ,  
AND  $[Z]^3 = 2..[X]^3$  ,  
OR  
 $Z^3 = 2..X^3$

Figure-2-

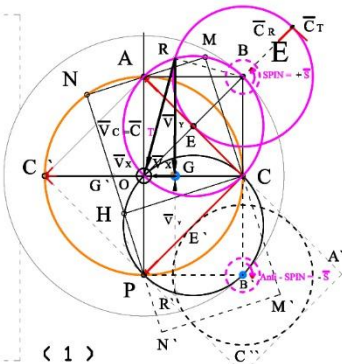
In (1) .., The **MOULD** of The 2-Right Triangles  $PAD$  ,  $PBD$  on where valids the  
Dublication  $[CP]^3 = 2..[CD]^3$  . and for Any Segment  $X$  , to Be **Duplicated to Y** .  
In (2) .., The Vector ,  $X$  , is Placed on  $CP$  , **Direction** through Point  $C$  . The Parallels ,  
(  $P_{xy} - A_x$  ) , (  $P_{xy} - D_z$  ) , to which Determine the Points  $A_x$  ,  $D_z$  , and such that ,  
 $CD_z = |Z|$  and  $C - P_{xy} = |X|$  , where valids the Relation  $\Rightarrow |Z|^3 = 2 . |X|^3$

# THE **QUANTUM - CLONING** MOULD OF PHOTONS

THE ANGULAR MOMENTUM  $\bar{B}$  AS SPIN  $\bar{S}$  OF PHOTONS ON THE CONJUGATE CIRCLE  
[  $B, BE = EC$  ] OF -- 2-Vectors 3-Poles R-Mechanism --

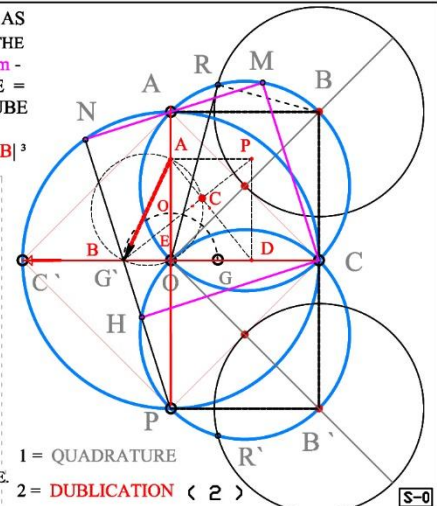
THE ANGULAR MOMENTUM  $\bar{B}$ , AS  
THE SPIN --  $\bar{S}$  -- OF PHOTONS ON THE  
2-Vectors 3-Poles Rotation- Mechanism -  
BECOMES a)...THE UNIT - SQUARE =  
 $CMNH = \pi . |AC/2|^2$  b)...THE UNIT-CUBE  
=  $|CP|^3 = |EB|^3$  , AND c)...THE  
CLONING - UNIT CUBE =  $|CD|^3 = 2 . |EB|^3$

**THE PROOF**  
> FROM Relation  $Spin=S = \bar{v}.B/2 = \bar{c}.B/2r$   
Then  $\bar{c} = |2.r.S/B| = \sqrt{C_T^2 + C_R^2}$  AND  
AT POINT R,  $\bar{C}_T = \bar{R}O = \sqrt{V_x^2 + V_y^2}$   
> AT Point R,  $|C_T = \bar{R}O| = \sqrt{V_x^2 + V_y^2}$   
Tangential Velocity  $\bar{R}O$ , ACTS AT Point  
 $G'$ , ...  $\bar{V}_x$  ON  $\ll CC'$  Axis &  $\bar{V}_y \perp$  ON  $CC'$  ...  
PUSHING  $CMNH$ , UNIT-Energy, SQUARE  
Forming THE TORSIONAL ANGLE  
 $\phi = \phi = G'PO = 2\pi/r^2$  Rads.  
> FOR Point .  $G'$  AT  $C'$ , Torsional Angle  
 $\phi = C'PO = 2\pi / r^2 = 45^\circ$ , which  
is The Bellow Motion of Photon, AND  
Energy-Square  $CAC'P = CMNH \cdot CHH' M'$  .



IN-(1)..THE SPIN {  $\bar{B}$  } = THE CIRCLE  
FROM HERPOLHODE =  $\{c.\pi . |EC|^2\}$ , OF  
PHOTONS, AND IS TRANSPORTED AS  
VELOCITY  $\bar{R}O = \sqrt{V_x^2 + V_y^2}$  & ACTS  
AT POINT  $G'$ , ...  $\bar{V}_x$  INTO,  $CC'$  AXIS  
AND  $\bar{V}_y$ , ONTO,  $CC'$  AXIS -  
PUSHING  $|CM| \approx CMNH$ , UNIT-ENERGY,  
SQUARE =  $\pi . |AC/2|^2$ , FORMING TORSIONAL  
ANGLE  $\phi = G'PO = 2\pi/r^2$  Rads.

IN-(2)..THE VELOCITY VECTOR  $\bar{AB}$   
ACTS AT POINT B - WITH POLES A, P -  
PUSHING THE ENERGY  $|EB|^3 = |\bar{V}_x|^3$ , UNIT-  
ENERGY, CUBE, INTO  $|CD|^3 = 2 . |\bar{V}_x|^3$  CUBE.



1 = QUADRATURE  
2 = DUBLICATION < 2 >

Figure-3-

In Fig. (1) The Spin  $\bar{B} \equiv \text{Herpolhode} \equiv \bar{c}.\pi . |EC|^2$  of Photons is Transported as Velocity  $\bar{R}O$   
and is Analyzed as  $\bar{v}_x = OG'$  ,  $\bar{v}_y = RG$  . At Point  $G'$  , the  $\bar{v}_y$  Vector Transfers the Energy of circle  
 $\pi . |EC|^2$  Into the **UNIT Square**  $CMNH$  such that  $CMNH \equiv [EO]^2 \equiv \pi . |EC|^2$  , **While** on (2) Poles  
 $A, P$  , of Vector  $\bar{v}_x$  , Forms The **UNIT- Meters**  $CP \equiv OG'$  and  $CD$  , such that  $[CD]^3 = 2 . [CP]^3$  .

# THE QUANTUM - CLONING UNIT-MOULD OF PHOTONS

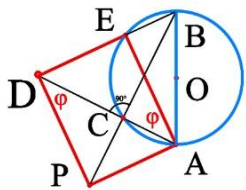
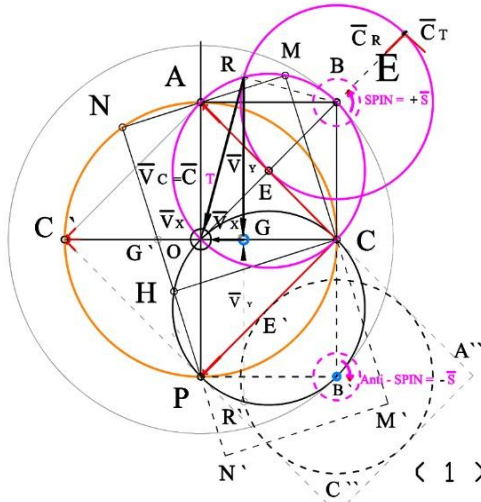
## THE ANGULAR MOMENTUM $\bar{B}$ AS SPIN $\bar{S}$ OF PHOTONS ON THE CONJUGATE CIRCLE [B, BE = EC] OF -- 2-Vectors 3-Poles R-Mechanism --

### THE PROOF

> FROM Relation  $Spin=S = \bar{w} \cdot \bar{B} / 2 = \bar{c} \cdot \bar{B} / 2r$   
Then  $\bar{c} = |2 \cdot r \cdot \bar{S} / \bar{B}| = \sqrt{\bar{C}_T^2 + \bar{C}_R^2}$  AND  
AT POINT R,  $\bar{C}_T = \bar{R}O = \sqrt{\bar{V}_x^2 + \bar{V}_y^2}$

> AT Point R,  $|\bar{C}_T = \bar{R}O| = \sqrt{\bar{V}_x^2 + \bar{V}_y^2}$   
Tangential Velocity  $\bar{R}O$ , ACTS AT Point  $G'$ ,  $-\bar{V}_x$  ON  $\ll CC'$  Axis &  $\bar{V}_y \perp$  ON  $CC'$  --  
PUSHING CMNH, UNIT-Energy, SQUARE  
Forming THE TORSIONAL ANGLE  
 $\Phi = \bar{r} \cdot \bar{\Phi} = G' \bar{P}O = 2\pi / r^2$  Rads.

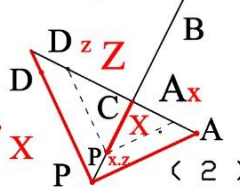
> FOR Point  $G'$  AT  $C'$ , Torsional Angle  
 $\Phi = C' \bar{P}O = 2\pi / r^2 = 45^\circ$ , which  
is The Bellow Motion of Photon, AND  
Energy-Square  $CAC'P = CMNH \cdot CHH'M'$ .



### THE CUBS-UNIT-MOULD

$$[CD]^3 = 2 \cdot [CP]^3$$

$$[Z]^3 = 2 \cdot [X]^3 \text{ VECTOR } / X$$

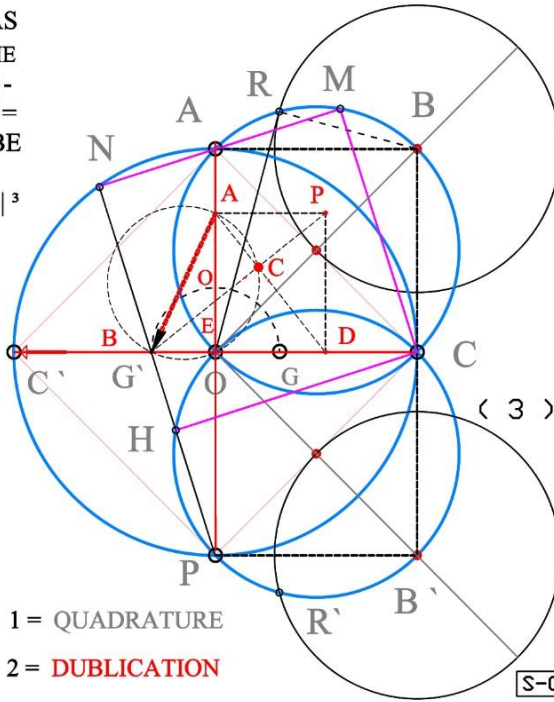


THE ANGULAR MOMENTUM  $\bar{B}$ . AS  
THE SPIN --  $\bar{S}$  -- OF PHOTONS ON THE  
2-Vectors 3-Poles Rotation- Mechanism -  
BECOMES a)...THE UNIT - SQUARE =  
 $CMNH = \pi \cdot |AC/2|^2$  b)...THE UNIT-CUBE  
=  $[CP]^3 = |EB|^3$ , AND c)...THE  
CLONING - UNIT CUBE =  $[CD]^3 = 2 \cdot |EB|^3$

IN-(1)..THE SPIN {  $\bar{B}$  = THE CIRCLE  
FROM HERPOLHODE =  $\{c \cdot \pi \cdot |EC|^2\}$ , OF  
PHOTONS. AND IS TRANSPORTED AS  
VELOCITY  $\bar{R}O = \sqrt{\bar{V}_x^2 + \bar{V}_y^2}$  & ACTS  
AT POINT  $G'$ ,  $-\bar{V}_x$  INTO,  $CC'$  AXIS  
AND  $\bar{V}_y$ , ONTO,  $CC'$  AXIS --  
PUSHING  $|CM| = CMNH$ , UNIT-ENERGY,  
SQUARE =  $\pi \cdot |AC/2|^2$ , FORMING TORSIONAL  
ANGLE  $\Phi = G' \bar{P}O = 2\pi / r^2$  Rads.

IN-(2)..THE VELOCITY VECTOR  $\bar{AB}$   
ACTS AT POINT B- WITH POLES A, P-  
PUSHING THE ENERGY  $|EB|^3 = |\bar{V}_x|^3$ , UNIT  
ENERGY, CUBE, INTO  $[CD]^3 = 2 \cdot |\bar{V}_x|^3$  CUBE.

- 1 = QUADRATURE
- 2 = DUPLICATION



**Figure-4-**

**In=(1)-** The Spin  $\bar{B} \equiv$   
**Herpolhode**  $\equiv \bar{c} \cdot \pi \cdot |EC|^2$

of Photons is Transported  
as Velocity  $\bar{R}O$ , and is  
Analyzed as  $\bar{v}_x = OG'$ ,  
 $\bar{v}_y = RG$ . At Point  $G'$ ,  
the  $\bar{v}_y$  Vector Transfers the  
Energy of circle  $\pi \cdot |EC|^2$   
Into Square CMNH such  
that  $CMNH \equiv [EO]^2$ ,

**While In=(2)-** From { The  
**2-Vectors, 2-Poles**

Rotating The Poles A, P,  
of Vector  $\bar{v}_x$ , Forms The  
**UNIT-Meters**  $CP \equiv OG'$   
and CD, such that  $[CD]^3$   
 $= 2 \cdot [CP]^3$ .

**In=(3)-** Are Formed, The  
2-

Right Triangles, **PAD, PBD**

from {The 2-Vectors, 2Poles

Rotating Squares  
**Mechanism**

On where valids the

Dublication of the Unequal  
Vectors.

**3.. Trisection.** [46] =  
Fig,31-32-333-34



A line ( *Two Points only* ) is Not a Great circle ( *more than three Points being in circle's Plane*) so Anything Built on this logic is a mislead false .The fact that the Sum of angles on any Triangle is  $180^\circ$  is springing for the first time , in Article (Rational Figured numbers or Figures) [ 9 ] .

**Conclusions :**

- 1.. From any Point M , there is only one Parallel to any A-B , Straight line .
- 2.. From Point M , there is only one Parallel to , A – B (when it goes  $\rightarrow \infty$ ) , Straight line .
- 3.. From Point M , there is only one Parallel to , B – A (when it goes  $\rightarrow \infty$ ) , Straight line .
- 4..The light-rays and consequently the Photons travel in Straight lines , **i.e. Photons follow** the Euclidean Geometry and NOT any other .
- 5..Time is the meter , to measure the changes in Energy = **motion** = Force x displacement , and NOT any other essence .

The essence of Universe is Space  $\equiv$  **Distance**  $[\oplus \leftarrow r \rightarrow \ominus]$  , Energy  $\equiv$  **motion**  $[\oplus \sigma \ominus]$  .

- 6..The Gravitational force G , causes the Bending of the light rays (of Photons) , and Not the warping of Spacetime , which meaning is Not existing Because this Concept has never been clarified .

This admission of two or more than two Parallel lines, instead of one of Euclid's, does not Proof the Truth of the admission. The same to Euclid's also , until the Present Proved method . Euclidean Geometry does not distinguish , Space from time Because time exists only in its Deviation - Plank's length level , neither Space from Energy - because Energy exists as **The Quanta** on any first Dimensional Unit AB , which as above connects the only two Fundamental Elements of Universe , that of Points or Sector = Segment = Monad = Quaternion , and that of Energy. [23]-[39].

**The Proposed Method in articles , Based on the Prior four axioms only , PROOFS, (Not using any admission but a Pure Geometric logic under the Restrictions imposed to seek the solution) that , through Point M on any Plane ABM (three Points only that are not coinciding and which consist the Plane) , Passes only one line of which all Points equidistant from AB as Point M , i.e. the right is to Euclid Geometry.**

The what is needed for conceiving the alterations from Points which are nothing , to Segments , **i.e.** quantization of Points as , *the discreteting = monads = quaternion* , to lines , Plane and Volume , is the acquiring and having Extrema knowledge .

In Euclidean Geometry the inner transformations exist as **Pure Points** , Segments , lines , Planes , Volumes, etc. as the Absolute Geometry is ( *The Continuity of Points* ) , automatically transformed through the three Basic Moulds ( *the three Master moulds and Linear Transformations exist as one Quantization*) to Relative external transformations , which exist as the , **material** , Physical world of matter and Energy ( *Discrete of Monads* ) . [43-44]

***The New Perception connecting the Relativistic Time and Einstein's Energy - is Now Refining Time and Dark -matter Force - clearly proves That Big -Bang have Never been existed .***

In [17-45-46] is shown the most important **Extrema Geometrical Mechanism in this Cosmos** which is that of **STPL lines** , that Produces and composite , **All the Opposite Space Points** from Spaces to Anti-Spaces and to Sub-Spaces as this is in a Common Circle *this is the Sub-Space* , to lines into a Cylinder .**This extrema mould is a Transformation i.e. It is a Geometrical Quantization Mechanism** ,  $\rightarrow$  for the Quantization of Euclidean geometry, *points* ,to the Physical world , **to Physics** , and is based on the following Geometrical logic , Since Primary Point ,A, is nothing and without direction and it is the only Space , and this Point to exist , **to be** , at any other Point ,B, which is not coinciding with Point ,A, then on this couple exists the Principle of Virtual Displacements  $W = \int_A^B P. ds = 0$  or  $[ds.(P_A+P_B) = 0]$  , **i.e.** For any  $ds > 0$  Impulse  $\mathbf{P} = (\mathbf{P}_A+\mathbf{P}_B) = \mathbf{0}$  and Work  $[ ds .(\mathbf{P}_A+\mathbf{P}_B) = \mathbf{0}]$  , **Therefore** , Each Unit  $\mathbf{AB} = \mathbf{ds} > \mathbf{0}$  , exists by this Inner Impulse (P) where  $P_A + P_B = 0$  . The Position and Dimension of all Points which are connected across the Universe and that of Spaces , exists , Because of this equilibrium Static Inner Impulse and thus **show the Energy-Space continuum** .

Applying the above logic on any Monad = *Quaternion*  $(s + \bar{v} \cdot \nabla i)$  , where ,  $s$  = the Real Part and  $(\bar{v} \cdot \nabla i)$  the Imaginary Part of quaternion so , Thrust of two equal and Opposite Quaternion is the **Action of these Quaternions which is** ,

$$(s + \bar{v} \cdot \nabla i) \cdot (s + \bar{v} \cdot \nabla i) = [s + \bar{v} \cdot \nabla i]^2 = s^2 + |\bar{v}|^2 \cdot \nabla i^2 + 2|s| |\bar{v}| \cdot \nabla i = s^2 - |\bar{v}|^2 + 2|s| |\bar{v}| \cdot \bar{r} \therefore$$

$$|\nabla i = [s^2] - [|\bar{v}|^2] + [2\bar{w} \cdot |s| |\bar{r}| \cdot \nabla i] \quad \text{where,}$$

$[+s^2] \rightarrow s^2 = (w \cdot r)^2$  ,  $\rightarrow$  is the **Real Part** of the new Quaternion which is , the **Positive**

**Scalar Product** , of Space from the same scalar Product ,  $s, s$  with  $\frac{1}{2}, \frac{3}{2}, \dots$ , **Spin** and this because of ,  $w$ , and which represents the massive , Space , Part of Quaternion  $\rightarrow$  monad .  $[-s^2] \rightarrow -|\bar{v}|^2 = -|\bar{w} \cdot \bar{r}|^2 = -[|\bar{w}| \cdot |\bar{r}|]^2 = -(w \cdot r)^2 \rightarrow$  is the always , the **Negative** Scalar Product , of **Anti-space** from the dot product of ,  $\bar{w}, \bar{r}$  vectors , with  $-\frac{1}{2}, -\frac{3}{2}$ , Spin and this because of ,  $-w$  , and which represents the massive , **Anti-Space** , Part of quaternion  $\rightarrow$  monad .  $[\nabla i] \rightarrow 2 \cdot |s| \times |\bar{w} \cdot \bar{r}| \therefore |\nabla i| = 2|w \cdot r| \cdot (w \cdot r) \cdot \nabla i = 2 \cdot (w \cdot r)^2 \rightarrow$  is a **Vector** of , the velocity vector Product , from the cross Product of  $\bar{w}, \bar{r}$  vectors with Double Angular velocity term giving 1,3,5, Spin and this because of ,  $\pm w$  , in inner structure of monads , and represents the , **Energy Quanta** , of the Unification of the Space and Anti-Space through the Energy (*Work*) Part of Quaternion .

A wider analysis in article [40-43]

**When** a Point ,A, is quantized to Point ,B, then becomes the line segment  $AB = \text{Vector } AB = \text{Quaternion } [AB] \rightarrow \text{monad}$  , and is the closed System ,A B, **and since** also from the law of conservation of Energy , *it is the first law of Thermodynamics* , which states that the Energy of a closed System remains constant , therefore *neither increases nor Decreases without interference from outside* , and so the Total amount of Energy in this closed system , AB , in existence has always been the same , **Then** the Forms that this Energy takes are constantly changing , **i.e.**

**The conservation of Energy is realized when Stored in Monads and following the Physical laws in E-geometry where then are Material**  $\rightarrow$  Points , monads , etc  $\leftarrow$  . **This is the Unification of this Physical world of , what is called matter and Energy , and that of Euclidean Geometry which are , Points , Segments , Planes and Volumes .**

For more in [48] .

**The Three Moulds** ( i.e. The three Geometrical Mechanism ) of Euclidean Geometry which create the METERS of monads and which are , *Linear* for a Perpendicular Segment , *Plane* for the Square equal to the circle on Segment , *Space* for the Double Volume of initial volume of the Segment , (*the volume of the sphere is related to Plane which is related to line and which is related to segment*) , **Exist on Segments** in Spaces , Anti-spaces and Sub-spaces .

This is the Euclidean Geometry Quantization to its constituents ( i.e. Geometry in its moulds ) .The analogous happens when E-Geometry is Quantized to Space and Energy monads [48].

METER of Points A is the Point A , the METER of line is the Segment  $ds = AB = \text{monad} = \text{constant}$  and equal to monad , or to the Perpendicular distance of this segment to the set of two Parallel lines between Points A,B , the METER of Plane

is that of circle on Segment = monad and which is that Square equal to the circle , number  $\pi$ , the METER of Volume  $^3\sqrt{2}$ , is that of Cube , on Segment = monad which is equal to the Double Cube of the Segment and Measures all the Spaces , the Anti-spaces and the Subspaces in this cosmos . Generally is more referred ,

a). There is **not any Paradoxes of the infinite** because is clearly defined what is a Point a cave and what is a Segment .

b). **The Algebra of constructible numbers and number Fields is an Absurd Theory**

Based on Groundless Axioms as the Fields are , and with Direction the Non-Euclid Orientations Purposes which must Be Properly Revised .

c). **The Algebra of Transcendental Numbers has been devised to Postpone the Pure Geometrical thought** , which is the base of all sciences , by changing the Base-Field of solutions to Algebra as

Base . Pythagorians Discovered the existence of the incommensurable of the diagonal of a square in relation to its side without giving up the Base , which was and is the geometrical logic.

d). All Theories concerning *the Unsolvability of the Special Greek Problems are Based on Cantor's shady Proof* , < *that the Totality of All Algebraic Numbers is Denumerable* > and Not Edified on the Geometrical Basic logic which is the foundations of all Algebra .

The Problem of Doubling the cube F-1-2-3 , as that of the Trisection of any angle F-33, is a Mechanical Problem and could not be seen differently and the Proposed Geometrical solutions is clearly exposed to the Critic of all Readers .

All trials for Squaring the circle are shown in [44] and the set questions will be answered on the Changeable System of the two Expanding Squares ,*Translation [T] and Rotation [R]* . The solution of Squaring the circle using the Plane Procedure method is now Presented in F-1,2 , and consists an , *Overthrow* , to all existing Theories in Geometry , Physics and Philosophy .

e). Geometry is the Base of all sciences and it is the reflective logic from the Objective reality , which is Nature , to our mind . (markos 30/10/2015)

The locus of all these Points is a straight line.

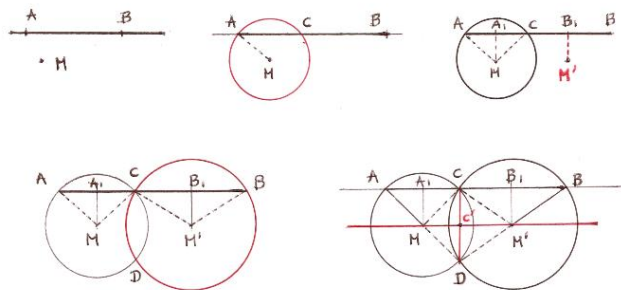
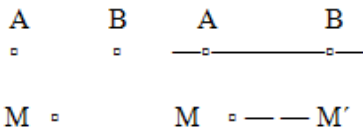


Figure – 8 - : The Three Points .

The main Question should be for EPR and for all arguing an Answer to the following .

Which Geometry Do , light-rays , follow ???

The Euclidean-Geometry EG  $\equiv$  Light ray  $\rightarrow \bar{v} \cdot [\bar{f}_n] + f_n \equiv$  Straight line  $\equiv \bar{v} \cdot [f_n]$

The Hyperbolic-Geometry HG  $\equiv$  Light ray  $\rightarrow \bar{v} \cdot [\bar{f}_n] + f_n \equiv$  A Circle  $\equiv [\bar{f}_n]$

The Riemannian-Geometry RG  $\equiv$  Light ray  $\rightarrow \bar{v} \cdot [\bar{f}_n] + f_n \equiv$  A Line-Vector  $\equiv \bar{v} \cdot [\bar{f}_n]$

The Material-Geometry MG  $\equiv$  Light ray  $\rightarrow$  A Line-Vector in Energy-Caves , and a Straight line to Infinite as the diagrams of the Stationary-Wave-crest-Wavelength  $\lambda$  .

$[\oplus \leftarrow \lambda \rightarrow \ominus] \rightarrow \lambda \leftarrow [\oplus \leftarrow \lambda \rightarrow \ominus] \equiv \bar{v} \cdot [\bar{f}_n] + f_n$  with Wavelength  $[\bar{v} \cdot \bar{f}_n] \rightarrow [\bar{v} = \bar{c} = \lambda \frac{f}{\phi}]$

[MG] [MG] [MG]  $\rightarrow$  The Dual-Nature of Light-Photon has the

Answer in [92] In this , answer is left to the Reader  $\rightarrow$  Markos Georgallides 25/9/2020  $\leftarrow$

Material - Geometry Particle-Light-Ray is  $[\oplus \leftarrow \lambda \rightarrow \ominus] \rightarrow \lambda \leftarrow [\oplus \leftarrow \lambda \rightarrow \ominus]$  , i.e.  $\overrightarrow{AB}$  line Vector of Two Points only is the Light Ray such for *Cave-Vector*  $\bar{v} \cdot [\bar{f}_n]$  , as for *Wave-Vector*  $[\bar{v} \cdot f_n]$  on Straight-lines to infinity and is the Geometry followed from Zero-Point to Infinite

Because Space  $\equiv$  Electric-Field , Anti-Space  $\equiv$  Magnetic-Field , Energy  $\equiv$  Motion ,

Quantization is a Necessity in Nature and Electromagnetic-Radiation ,is the Only Complex Way of motion and for the Energy , which is motion , is to Travel and Composited in Caves .

( markos 30 / 05 / 2026 )

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Article [125] is Dedicated to the **National Technical University of Athens** , NTUA , from where I Graduated and Acquired the Path Knowledge of the Truths of Nature..

**Το Άρθρο [125] είναι Αφιερωμένο στο Εθνικό Μετσόβιο Πολυτεχνείο ( ΕΜΠ ) , από όπου Αποφοίτησα και απέκτησα την Ατραπό της Γνώσης των Αληθειών της Φύσης.**

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