
The Expanding Universe Without Big-Bang

Markos Georgallides

Larnaca, Cyprus Civil-Structural Engineer (NATUA), Athens, Greece

Email address:

georgallides.marcos@cytanet.com.cy

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Abstract: Hypothesis without big-bang is analyzing Dark-matter, Dark-energy and reveals the way it occurs and how expansion is happening. Gravity-field is a Rest field, composed of two opposite signed elements ($+s^2$), ($-s^2$) consisting the minimum energy Quanta Spinning Space dipole, and jointed by the Gravity-force, which is the Maxwell's - Gravity's Displacement current and acting on any other moving or not particle. Because Dark-matter ($\pm cs^2$), moves with constant light velocity, c , and is composed of two opposite signed elements ($+cs^2$), ($-cs^2$) and Dark-energy [$\bar{c} \cdot \bar{V}i$] as Thrust moves with light velocity, so is continually effecting on the two fragments separately and on their dipole, the Dark-matter dipole is jointed by Gravity-force, formulating Heap Mixture, of the spherical opposite signed elements highlighting, and the dipole massive, heavy, invisible Dark matter, consisting dipole energy blobby volumes as Dark Fringes, and repel. The definitions for Quanta of Space and Energy have been elucidated. DM and DE move with light velocity so dilation and expansion have a parallel motion. Expansion occurs on the DM-DE Heap Mixture, by rolling on Gravity-field, with the maximum constant velocity, c , formulating, Zero \rightarrow Discrete \rightarrow Infinite Geometrical Universe. Philosophy was the first instrument of understanding world, which was evolve to geometry, math and physics. Euclid's elements consist a small set of intuitively appealing axioms, proving many other propositions. Projective, Hyperbolic and Elliptic geometry is proved to be an Extrema in Euclidean geometry where on them Einstein's theory GR [A theory which has not elucidated the base of its Physical-content and adopted the wrong base of Non-Euclid geometries] is implicated and calls a circle segment as line and the spherical disk as plane in physical space. In Space-Energy geometry agrees with the Physical reality, on unit which is The Electromagnetic field of the Quantized on AB Energy Space Vector, on the contrary to General relativity of Space-time which is based on the rays of the non-Euclidean geometries to the limited velocity of light and Planck's cavity. Euclidean geometry elucidated the definitions of geometry-content, and describes the Space-Energy beyond Plank's length level [Gravity Length $3,969.10^{-62}$ m], reaching Point = $L_v = e^{i \cdot (\frac{N\pi}{2})^{b=10^{-N}} = -\infty}$ m = 0 m, which is nothing and zero space. Quantization of Energy is done in Space-tanks, on material points, tiny volumes and on points consisting the Equilibrium Opposite Twin of Space Anti-space.

Keywords: Dark Matter, Dark Energy, Expanding Universe

1. The Article: Some Physics

Aethergy is a motionless substance, a mixture of aether and kinetic energy, distributed uniformly all over the universe and having the property of forcing any mass in it to move like in a spontaneous reaction, separating aether, a , from kinetic energy k . Neither a nor k , are manifested as such until their mix, $a-k$, comes into contact with mass while the separation of a from k is causes aethero-vortices. Does surrounding aethergy, $a-k$, comes in to fill in the gap, implying that it moves too, even for a fraction of an instant? The answer is negative. What happens during that fraction is

that the released aether transforms the non- k energy produced by the mass into k , absorbing it and restoring aethergy's spatial continuity. But, what kind of energy is the non- k energy? To answer this question a working definition of the terms "mass", "matter" and "non- k " energy is needed. A mass is a physical body, and a physical body is made up of two distinct substances, matter and non- k energy, m and e , incapable of forming a body, $m-e$, by themselves separately, and manifest able as such only upon contact with $a-k$. To justify this definition and answer the question posed, the question: "Why should a and m be mixed with energy in the first place", should be answered. We must imagine them as two kinds of substances, which are unable to interact with

each other by construction. A third kind of substance is required to accomplish this task: A substance, which is common to both of them and hence, mixed with them; and a substance, which at the same time is distinct and hence, of a different form. If the third substance in each mix were the same, the mixed entities would be as unable to interact as a and m are by themselves. The same if the third substance were not the same. The “bridge” is “common and yet distinct”, and that's exactly what energy serves by being common to both a - k and m - e , and yet distinct with k exclusively mixed with a , and e exclusively mixed with m . Now, there is a kind of mass, self-existent but also in all physical bodies, such that the e in its mass bond m - e may completely change to m - k right upon contact with a - k , regardless of the self-existing or co-existing in a greater body character. It happens so because it is the kind of mass with the least efficiency loss in transmuting k to non- k energy, and runs exactly with the speed of light, c ; it is a kind of “swift” so to speak, particle. Letting $E=k+e$ and M be denoting total energy and mass, respectively, $E=Mc^2$ and $k^*=1/2Mc^2$ is the case with the swift particle, implying that the remaining $1/2Mc^2$ is potential energy, force field. It is induced by the replacement of e by k . What kind of a force field? The instantaneous change of the e of the swift particle to k must be owing to its chemical structure and hence, we have a Charles Augustin de Coulomb (1736-1806) force field. Aether “specializes” in the transformation of this kind of potential energy back to k in the sense of doing it with zero efficiency loss. Consequently, aether transforms into k exactly the amount of k , $1/2Mc^2$, aethergy lost to the swift particle; and by absorbing it, aethergy's spatial continuity is restored. We have in operation the minimum energy principle in mutual connection with the least-efficiency-loss mass. And, all this takes place “automatically” at a fraction of an instant.

Does the swift particle exist by itself as we asserted a few lines earlier? Perhaps, yes, perhaps, no. The essence is that it co-exists with any greater body, and it will do run with k^* upon the contact of the body with aethergy. But, not all of the body consists of swift particles and the remaining part of it will move with $k < k^*$ under a force field which may not necessarily be a Coulomb one. And, the total aether released may not be able to transform all potential energy back to k , because aether's specialization in Coulomb fields is equivalent to positive efficiency loss when the transformation of other kinds of potential energy is at stake. There will do be such losses in connection with the intermolecular force surrounding thermal energy prompting the workings of the second law of thermodynamics: Minimum energy principle in operation with regard to the swift particle, but maximum entropy principle with respect to any other type of mass, totaling to the second law of thermodynamics, but in a way disturbing the uniformity, the density of aethergy, and disrupting the equilibrium of the system, unless there is a built-in stabilization mechanism. If the system was the outcome of some big bang, this mechanism should be one providing smaller big bangs constantly. The big bang incited

the greatest etherovortex of all times; this is actually what it was. But, smaller ones, small big bangs may be incited any time by the accumulation of small vortices. More precisely, vortices disarrange the spatial distribution of aethergy. The accumulation of disarrangement may lead by itself to a powerful vortex, which only secondarily could be attributed to motion of mass, because it is the indirect cumulative effect of the relatively weaker vortices from such motion. The scale of the secondary effect may be so large as to reverse the causality running from motion to vortex. Such powerful vortices are the sources of new ethergy production and the cause of a movement of masses toward them, swallowing them, and creating small Creations upon contact with the new ethergy. If equilibrium is the case, the time-scale of these workings is infinitesimal, because they are such as to be preserving aethergy “density” unchanged.. Etherovortices revive masses too, but how do they do it exactly? Let us go back to the m - k structure in connection with the swift particle. k comes not to destroy the bond m - e of this particle, but only to take the place of e . This exactly is what revives, namely the replacement of any in general non- k energy by k . And, this exactly character of the bond of the swift particle is what makes this particle be the one with the least efficiency loss and with unaffected by motion age. For the other forms of M , age change depends on the extent of bond change brought about by the above considerations, which change m - e to m - e - k . The faster a mass is capable of moving, the greater it means its ability to “absorb” k , and the less the change in its bond, or according to the terminology used until this subsection, the less the change in its hypostasis. Responsible for hypostasis change from the viewpoint of its manifestation as constant discontinuity is the automatism of aethergy's workings that is needed to maintain its own continuity. In other words, as far as overall system equilibrium is concerned, the continuous transformation of the structure of m - e is needed to maintain a - k unaltered under of course the regulation of the system by the small big-bang mechanism. Put differently, a continuum of irreversible, irreproducible, unique m - e 's is needed to sustain an a - k eternally. Or, of course, *vice versa*; *mutuis vis viva*. The totals of all substances would remain fixed at the pre-interaction and hence, equilibrium levels, which in turn equilibrium wants energy to be at its minimum but entropy to be maximum given the constancy of total energy. And, since there can be no other quantities of the substances than the pre-interaction ones, these quantities would be the maximum ones too, rendering the quantifications “max-min” superfluous in the description of equilibrium: A system is in equilibrium when both energy and entropy are at equilibrium. Fixing also energy and entropy at their equilibrium levels renders superfluous the distinction between closed and isolated systems.

To conclude, a greater speed than that of light is the one that would move the traveling substance from the one end of the universe to the other at once. But, then the substance would not be traveling, and the speed would be no speed but kinetic energy. The substance would be distributed uniformly

everywhere in the universe, waiting to unleash the tremendous kinetic energy responsible for such a state of the cosmos. This is why there has to be aethergy; because there has to be speed greater than that of light for some kind of substance; speed, in terms of mass, but kinetic energy, in terms of this substance. A substance, which is not mass, because the most mass can do from the viewpoint of k , is to become a swift particle. A substance for which the speed of mass is not the conjunction of two separate entities, speed and mass, but kinetic energy intrinsic to the substance, as intrinsic as non- k energy is to mass. In the ninth, 1878, edition of *Encyclopedia Britannica*, James Clerk Maxwell (1831-1879) was writing about the energy of light in the lemma for "Ether" (pp. 568-572) that: "If we adopt either Fresnel's or Maccullagh's form of the undulatory theory, half of this energy is in the form of potential energy, due to the distortion of elementary portions of the medium, and half in the form of kinetic energy, due to the motion of the medium." By the term "medium", Maxwell means the aether, having earlier in this lemma dismissed the material hypostasis of it. But, as we saw, half may be potential and half may be kinetic energy if a substance does have material hypostasis: $E=2k$. Of course, professor Maxwell was unaware of this relationship, but he does seem to be expecting developments on the concept like those presented earlier here...

Towards A Creation Hypothesis

From Chaos came forth Erebus and black Night; but of Night were born Aether and Day, whom she conceived and bare from union in love with Erebus... Hesiod, Theogony, (c. 700 B.C.)

Hesiod's Theogony does connote to our physics: In the beginning, there was Chaos, a world in which events were inconsequential and nothing sensible could be made out of it. For example, static electricity would appear temporally before rubbing amber with fur, or spatially somewhere else; and in the place of static electricity nothing or a nuclear blast from some other faraway interaction might be experienced. It was a chaotic world, because there was no time to preserve the sequencing of events, thus depriving the nexus cause-effect of its spatiotemporal dimension. All was random, all was incidental. There was no time or for that matter, anything else that would ensure what comes first and what comes second. Matter phenomena were independent from energy phenomena. In such a world, mathematics did exist, but the lawlessness of physics and chemistry was delivering chaos.

But, next, Day, i.e. light out presumably of a thermal source, and Aether, were born from the love, i.e. spontaneous reaction, Big Bang, between Erebus, i.e. matter, and Nyx, the perfectly black night, i.e. a substance having withheld all energy and hence, having the blackness of a black, which cannot be found anymore in nature. That is, Chaos was followed by a separation of matter from energy through the creation of such a substance, aiming at maximizing thermal disequilibrium and giving rise to a Big Bang. That substance is the aethergy, whose spontaneous reaction with matter made matter move, separate aether from kinetic energy, and develop out of this energy light-producing non-kinetic

energy... According to Orpheus, Night, rather than Chaos, is the first principle... Aether is the substance ordering universe as described by our physics, which now may be completed as follows. The process under the small Creations, mentioned in the end of the last Section, regenerates the perfect black or at least darker blackness than the rest in nature and hence, this type of vortices may be called black warps, reflecting at the same time this term the abrupt disruption in the spatial distribution of ethergy. Black warps are the primary source of new ethergy and matter, keeping the overall system in equilibrium. Without them, which separate Nyx from Erebus again and again, all cosmos would be tending to become ethergy, Night... *Wherefore also these Kinds [elements] occupied different places even before the universe was organized and generated out of them. Before that time, in truth, all these were in a state devoid of reason or measure, but when the work of setting in order this Universe was being undertaken, fire and water and earth and air, although possessing some traces of their known nature, were yet disposed as everything is likely to be in the absence of God; and inasmuch as this was then their natural condition, God began by first marking them out into shapes by means of forms and numbers.* Plato (Timaeus, 17) Indeed, myths appear to be are truth in the form of allegories and fairy tales. They seem to save phenomena when the knowledge about them vanishes from memories when socioeconomic and political circumstances dictate so, when adjustment to such priorities changes individual and collective priorities for a long time. Myths save phenomena sociologically but wisdom problems like the triad Quadrature-Doubling the Cube-Trisection, predispose towards the rediscovery of this knowledge. The three Milesian philosophers, Thales, Anaximander (c.610-c.546 B.C.), and Anaximenes (585-528 B.C.), suggest that the pre-Creation world was boundless. If this were so, indeed, then according to this manuscript, here, one more perhaps characteristic of the Creation was to endow space with finiteness. There is a transition in ancient Greek thinking from *Chaos* to *Apeiron*; both are connected with the infinite, and it seems that *Apeiron* is the ordered one whereas *Chaos* connotes disordered infinite. The Creation according to Milesians, put some good order to the the infinite, and I maintain that one more characteristic of this order was the finiteness of the infinite of space. One striking resemblance of my theory here with the position of the Milesians about the origin and character of the cosmos, is that "genesis and decay", small creations, small big bangs, according to this monograph, will never stop. Aristotle explains that it is in this temporal nexus that the notion of *apeiron* was held by the Milesians. Nothing is going to happen to the cosmos for as long as its "batteries" of small creations work, indeed. Moreover, these considerations appear to make justice to Pythagorean and Platonic position that: *Nothing can exist if it doesn't contain continually and simultaneously the limited and the unlimited, the definite and the indefinite* (Plato, Philebus, 16). Unfortunately for the Pythagoreans, it was too early to find out that this is the context within which empirical content is conferred to the

incommensurability of numbers, which they had discovered. For us here, in empty space, numbers do constitute Platonic forms. But, in the space filled with a-k and m-e, uniqueness, irreproducibility, irreversibility of events implies that only number one exists in Cosmos. It is a different matter if man needs the Arithmetic, Mathematics, and Geometry to study the Cosmos. The truth is that it is a numberless and timeless Cosmos. And, the only Platonic form left to speculate upon outside Plato's Cave in an Aristotelian fashion, is the "Arche", (Αρχή).

Diagram of Hesiod Hypothesis agreeing with E-geometry.

The Hesiod Creation Hypothesis without Big-Bang

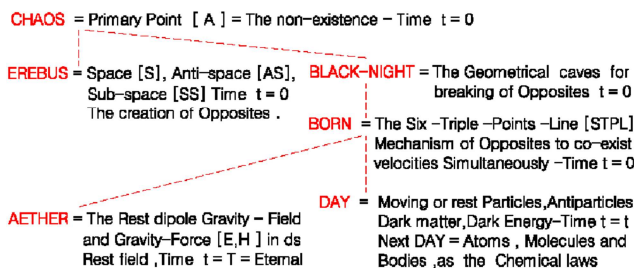


Figure 1. The Hesiod Creation Hypothesis.

2. Introduction

Following Euclidean geometry logic, short definitions and elucidations are made clear, and which are proceed.

2.1. What Is a Point and, What Is a Segment.

Point is nothing and has not any Position and may be anywhere in Space, therefore, the Primary point, A, being nothing also is in no Space, and it is the only Point and nowhere, i.e. Primary Point is the only Space and from this all the others which have Position, therefore and since this is the only Space, so to exist point, A, at a second point, B, somewhere else, point, A, must move towards point, B, where then $A \equiv B$. Point B is the Primary Anti-Space which Equilibrium point, A, and both consist the Primary Neutral Space \rightarrow PNS = $[A \equiv B]$. The position of points in [PNS] creates the infinite dipole and all quantum quantities which acquire Potential difference and an Intrinsic momentum $\pm \Lambda$ in the three Spatial dimensions (x,y,z), [26] and on the infinite points of the (n) Layers at these points, which exist from the other Layers of Primary Space, Anti-Space and Sub-Space, and this is because Spaces are monads i.e. quaternion.

Any magnitude having Position, x,y,z related to a coordinate system and Direction, \rightarrow , \leftarrow , is characterized as Vector and extensively as quaternion). [9]. From [15] a point C is on Straight line AB when $AC+CB=AB$, and continuous on dimensional unit AB when unit $AC > 0$ or $AC = ds \rightarrow AB$. Unit $ds = AC$ is a discrete monad so,

1a. Straight line AB is continuous with points as filling (Infinitely divisible).

2a. Straight line AB is discontinuous (discrete) with

dimensional Units, ds, as filling, and (that is made up of finite, indivisible parts the Monads $ds \rightarrow AB / n$, where $n = 1, 2, \rightarrow \infty$)

3a. Straight line AB is discontinuous (discrete) also with dimensional Units $ds = AB$, $ds = \text{quantum} = AB / n$ (where $n = 1, 2, 3 \rightarrow \infty$, = quaternion $[a + b.i] / n$ Infinitely divisible keeping the conservation of properties at end points A, B) as filling and continuous with points as filling (for $n = \infty$ then $ds = 0$ i.e. a point). i.e Monads $ds = 0 \rightarrow \infty$ are simultaneously (Actual infinity) and (Potential infinity) in Complex number form, and this defines, infinity exists between all points which are not coinciding and because, ds, comprises any two edge points with imaginary part where then this property differs between the infinite points. What is shown is the way of Quantization of the Euclidean geometry (point, sector, line, plane, volume) to the Physical world, to Physics, based on the Geometrical logic alone, which is according to Pythagoras, \rightarrow Unit is a Point without position while a Point is a Unit having position.

This is the Vector relation of Monads, ds, (or as Complex Numbers (quaternion) in their general form $w = a + b.i$), which is the Dual Nature of lines (discrete and continuous). It has been shown that Primary Neutral Space is not moving and Time is not existing, so Points, in Primary Space cannot move, to where they are, because are already there and motion is impossible. Since Points C,D,, of Primary Neutral Space, PNS, are motionless ($v = 0$) at any Time (the composed instants are $dt = 0$) then motion is impossible. i.e. for monads issues $[ds = a + b.i = v.dt]$ and for

$a = 0$ then $ds = b.i = v.dt$ and for $b \neq 0$, $dt = 0$ then $ds = \text{Constant} = v.0$

$b = 0$ then $ds = a = v.dt$ and for $dt = 0$ then $\rightarrow ds = a = \text{Constant} = v.0$ therefore in PNS, $v = \infty$, $T=0$

meaning infinite velocity, v, and Time not existing, so since any Arrow (vector) moving from point A to point B, then exists a Numerical order $A \rightarrow B$ which is not valid for Temporal order (dt). In case $dt = 0$ then motion from Point A to point B has not any concept, and distance CD and anywhere exist the Equal CD is unmovable, i.e. The Motion of points C,D of PNS is not existing because time ($dt = 0$) and exists infinite velocity ($v = \infty$) while motion of the same points C,D exists in PNS out of a moving Sub-Space of AB (Arrow CD is one of the ∞ roots of AB).

Monads $ds = 0 \rightarrow \infty$ are Simultaneously, actual infinity (because for $n = \infty$ then $ds = [AB / (n = \infty)] = 0$ i.e. a point) and, potential infinity, (because for $n = 0$ then $ds = [AB / (n = 0)] = \infty$ i.e. the straight line through AB).

Infinity exists between all points which are not coinciding, and because Monads, ds, comprises any two edge points with Imaginary part, then this property differs between the, i, infinite points or $ds = \lambda i + \nabla i$.

The Structure Of Energy Monads And Segments:

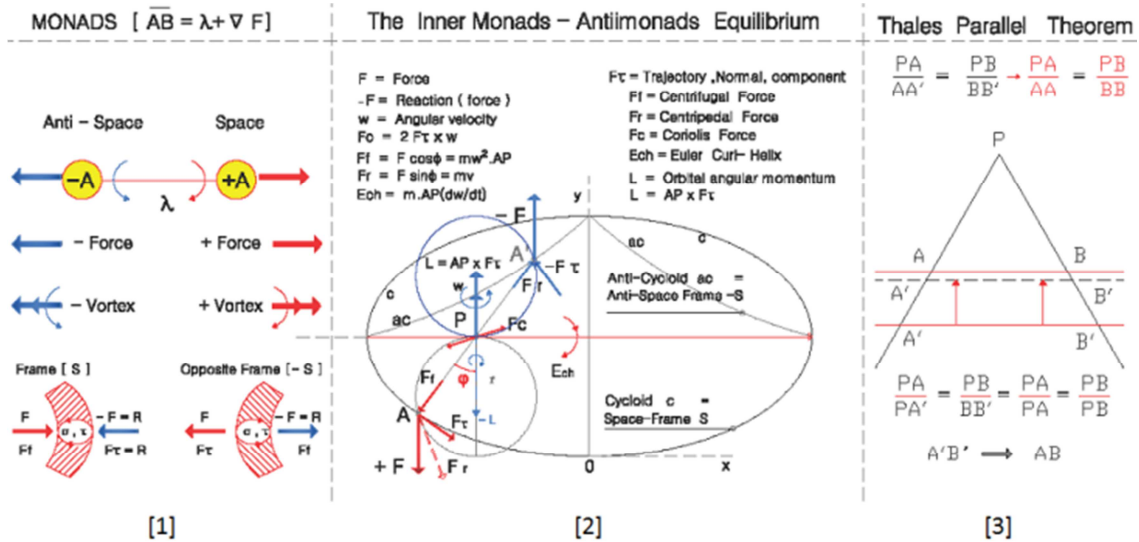


Figure 2. [1] → The equilibrium of monads [2] → The inner Monads structure of a Stationary Wavelength $\lambda = 2\pi r$ executing a Free vibration under Equilibrium of forces in Cycloid, Anti-cycloid. [3] → Thales parallel extrema.

On Energy Monad AB which is $= 0 \leftrightarrow AB \leftrightarrow \pm \infty$ exists $< a$ bounded State of energy for each of the Infinite Spaces and Anti-Spaces $>$ and the [Dipole $AB = \text{Matter}$] is the communicator of Impulse $[P]$ of Primary Space. This Energy monad is modified as the Quanta of Energy and is represented as the Dipole shown below, T, i.e.

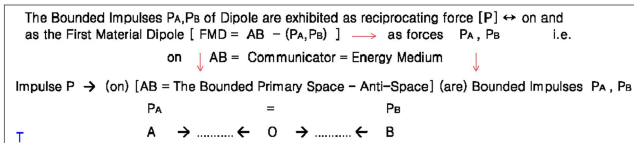


Table-T : The Bounded Forces in Space Anti-space Dipole AB.

This motion is Continuous and occurs on Dimensional Units, ds , which is the Maxwell's-Monads Displacement Electromagnetic current $[E + \bar{v} \times P]$, and not on Points which are dimensionless, upon these Bounded States of $[PNS]$, Spaces and Anti-Spaces, and because of the different Impulses P_A, P_B of points A, B and that of Impulses $P_i A, P_i B$, of Sub-Spaces, are either on straight lines AB or on tracks of the Spaces, Anti-Spaces and Sub-Spaces of AB . The range of Relative velocities is bounded according to the single slices of spaces (ds). [14-15], [39-40].

Since Primary point, A , is the only Space then on this exists the Principle of Virtual Displacements $W = \int_A^B P \cdot ds = 0$ or $[ds \cdot (P_A + P_B) = 0]$, i.e. for any $ds > 0$ Impulse $P = (P_A + P_B) = 0$ and $[ds \cdot (P_A + P_B) = 0]$, Therefore, Each Unit $AB = ds > 0$, exists by this Inner Impulse (P) where $P_A + P_B = 0$, \rightarrow i.e. 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, on the contrary should be one point only (Primary Point $A = \text{Black Hole} \rightarrow ds=0$ and $P = \infty$). [17, 22] \leftrightarrow Monad AB is dipole $[\{A(P_A) \leftarrow 0 \rightarrow (P_B)B \}]$ and it is the symbolism of the two opposite forces (P_A), (P_B) which are created at points A, B . This Symbolism of primary point (zero 0 is nothing) shows the creation of Opposites, A and B , points from this zero point which is Non-existence. [12]

All points may exist with force $P = 0 \rightarrow \{PNS \text{ the Primary Neutral Space}\}$ and also with $P \neq 0$, ($P_A + P_B = 0$), $\{PS \text{ is the Primary Space}\}$ for all points in Spaces and Anti - Spaces, therefore $[PNS]$ is self-created, and because at each point may exist also with $P \neq 0$, then $[PNS]$ is a (perfectly Homogenous, Isotropic and Elastic Medium) Field with infinite points (i) which have a \pm Charge with force $P_i = 0 \rightarrow P = \Lambda \rightarrow \infty$ and containing everything.

Since points A, B of $[PNS]$ coincide with the infinite Points, of the infinite Spaces, Anti-Spaces and Sub-Spaces of $[PNS]$ and exists rotational energy $\pm \Lambda$ and since Motion may occur at all Bounded Sub-Spaces ($\pm \Lambda, \lambda$), then this Relative motion is happening between all points belonging to $[PNS]$ and to those points belonging to the other Sub-Spaces ($A=B$). The Infinite points in $[PNS]$ form infinite Units (monads = segment) $A_i B_i = ds$, which equilibrium by the Primary Anti-Space by an Inner Impulse (P) at edges A, B where $P_i A + P_i B \neq 0$, and $ds = 0 \rightarrow N \rightarrow \infty$.

Monad (Unit $ds = \text{Quaternion}$) \bar{AB} is the ENTITY and $[AB - P_A, P_B]$ is the LAW, so Entities are embodied with the Laws. Entity is quaternion \bar{AB} , and law $|AB| = \text{Energy length of points } [A, B] \text{ or wavelength when } AB=0 \text{ and imaginary part the forces } P_A, P_B, \text{ as fields in monads, (This is distinctly seen for Actions at a distance, where there the continuity of all intermediate points being also nothing, is succeeded on quantized, tiny energy volume which consists the material point i.e. a field, or by the Exchange of energy in the Inner-monads field). [39-40].$

For the Conservations Navier - Stokes laws [mass, momentum, energy] and the tiny Volume in Nature : [40-41]

2.2. What is Mass.

Using Gauss' and Ampere's law for continuity equation [Conservation of mass] then in a tiny volume dV exists, $\partial \rho / \partial t + \nabla \cdot j = \sigma$, or equally $\partial \rho(\text{mass}) / \partial t + \nabla \cdot j = 0 \rightarrow \partial \rho / \partial t + \nabla \cdot (\rho \cdot \bar{v}) = 0$ where, $\nabla = \text{Divergence}$, $\rho = \text{the amount of the quantity, } q, \text{ per unit volume, } j = \rho \cdot \bar{v}, \text{ the flux of, } q, t = \text{time, } \sigma$

= the generation of, q , (mass) per unit volume per unit time, and since for $\rightarrow \sigma > 0$ generate, q , (sources), $\rightarrow \sigma < 0$ remove, q , (sinks), \rightarrow for $\sigma = 0$ and conserve, q , (not created – not destroyed), \vec{v} = the velocity vector. In Stokes-Green theorem angular velocity, w , of inner tiny volume, dV , says that the integral of a differential form, w , over the boundary of Orientable manifold, dV , is equal to the integral of its exterior derivative, dw , over the whole volume dV , i.e. $\int_{\partial V} w = \int_V dw$ and Kelvin-Stokes theorem is for surface integral of the curl, $\nabla \times$, of a vector field, F , over a surface, S , in Euclidean three-space to the line integral of the vector field over its boundary, ∂S , as $\iint_S \nabla \times F \cdot dS = \oint_{\partial S} F \cdot dr$.

Since energy of waves is conserved then whenever the energy decreases from a small volume dV , it is accompanied by the flow of the same energy through the boundary of the small volume and the current, \vec{j} , ensures conservation of energy until else where. Electromagnetic waves are able to transmit energy through a vacuum (empty space) by storing their energy in their Standing Transverse Electromagnetic dipole wave as above, and thus considered completely particle like, and in transverse interference pattern to be considered as completely wave, so when,

a. Energy $I_d = \frac{\rho \pi^2 c^3}{2\lambda^2} [\epsilon E^2 + \mu H^2]$ is in volume $V = \left[\frac{4(w^2 r^2)^3}{3\pi} \right]$ then energy is like \rightarrow Particle Energy and when,

b. Energy $I_d = \left(\frac{\rho c}{2} \right) (wA_0)^2$ is in Interference pattern then energy is like \rightarrow Wave

This tiny energy volume for wave's case, is the Cycloidal volume $dV = 4/3 \cdot \pi \cdot ab^2 = \frac{4\lambda^3}{3\pi}$, [because $a = \lambda$, $b = \lambda/\pi$] of the Electromagnetic stationary field $[\vec{E} \times \vec{H}]$ where Intensity $Sc = \left[\frac{\epsilon E^2}{2} + \frac{\mu H^2}{2} \right]$ and ϵ, μ the Permittivity, (the Dielectric constant multiplier), Permeability (the Dielectric constant multiplier). [41]

Conclusion: All particles are characterized by their quantized cave the Space $V = \frac{4\lambda^3}{3\pi} = \frac{4(w^2 r^2)^3}{3\pi}$ composed of an inner Electromagnetic wave constituent $[E \perp H]$, $h = 2\pi/\lambda$, the reaction to these velocity motions [the mass $m = (pr) \cdot w/c^2 = \frac{h \cdot w}{2\pi \cdot c^2}$], the external energy momentum $p = \frac{h}{2\pi \lambda}$ and Spin (the helically rotating electric field vector corresponding to a circularly polarized Electromagnetic wave propagating with attenuation to the right. Inner, r, w magnitudes of, V , are achieved from the inner, r, w , cave of breaking the opposites). Conservation laws of energy, linear and angular momentum are satisfied by their inner Anti-cycloidal motion, (which is happening on the evolute curve).

2.3. What is Momentum.

In general, momentum $p = m\vec{v}$, therefore the amount of momentum per unit volume, dV , is, $\rho\vec{v}$, (since $m =$ volume. ρ) and for surface, the normal stress $\sigma = F/dS = -F$ and then becomes $\rightarrow \partial \rho \vec{v} / \partial t + \nabla \cdot (\rho \cdot d\vec{v}) \cdot V = \nabla \cdot \sigma + \rho \cdot g$, i.e. momentum is converted into a normal stress, σ , in tiny volume plus momentum of the whole volume as mass, body force, where ∇ is nabla symbol for, divergency,, g , is gravity's net acceleration,, ρ , the inner volume density. This interpretation

applied to Young's interference and Polarizer experiments for dark fringes then $\rho = [\epsilon E^2 + \mu H^2]$ and thus is shown the unified understanding between the classical Electromagnetic field and the quantum particle of light, Fig. 7.

2.4. What is Energy.

By definition energy is defined as the ability to do some work, W . According to D'Alembert's principle of virtual work, δr_i , due to applied forces, F_i , and Inertial forces, $m_i a_i$, acting on a three-dimensional acceleration, a_i , system of n , particles whose motion is consisted with the constraints then $\delta W = \sum_{i=1}^n (F_i - m_i a_i) \cdot \delta r_i = 0$, where $i=1, 2, \dots, n$ simply labels the particles and in terms of generalized coordinates then $\delta W = \sum_{j=1}^n \sum_{i=1}^n (F_i - m_i a_i) \cdot \left(\frac{\partial r_i}{\partial q_j} \right) \delta q_j = 0$ suggesting that the applied forces may be expressed as generalized forces, $Q_i = \delta W / \delta q_j = \sum_{i=1}^n F_i \cdot \left(\frac{\partial r_i}{\partial q_j} \right)$ and if the forces are conservative where Force F is the gradient of the scalar potential, V , then $F_i = -\nabla V \rightarrow Q_j = -\sum_{i=1}^n \nabla V \cdot \left(\frac{\partial r_i}{\partial q_j} \right) = \partial V / \partial q_j$ i.e. generalized forces can be reduced to a potential gradient in terms of generalized coordinates. Lagrange's generalized equations of motion are $Q_j = \frac{d}{dt} \left(\frac{\partial T}{\partial \dot{q}_j} \right) - \frac{\partial T}{\partial q_j}$, where $T = \frac{1}{2} \sum_{i=1}^n m_i \dot{r}_i \cdot \dot{r}_i$, the Kinetic energy and $\frac{\partial T}{\partial q_j} = \sum_{i=1}^n m_i \dot{r}_i \cdot \left(\frac{\partial \dot{r}_i}{\partial q_j} \right)$, the partial derivative of total kinetic energy, T , with respect to the generalized coordinates q_i , and generalized velocities \dot{q}_j .

The Lagrangian is $L = T - V$ where T = the kinetic energy and V = the Potential energy of the system. [21-22]

Euler-Lagrange second kind equations issue for any system with, $j=1, 2, \dots, m$, degrees of freedom includes, m , generalized coordinates, q_i , and velocities, \dot{q}_j , and it is $\frac{d}{dt} \left(\frac{\partial L}{\partial \dot{q}_j} \right) = \frac{\partial L}{\partial q_j}$, an easy generalized coordinate method choosing minimum q_i , and constrained forces are incorporated into the geometry of the problem. Both above generalized equations are derived from Newton's 2nd Law since $F_i = -\nabla V$ is a force independent of third-or higher-order derivatives of, r , and $\delta W = F \cdot \delta r = m \ddot{r} \cdot \delta r = m \cdot \sum_j \left\{ \sum_i \left[\left(\frac{d}{dt} \right) \cdot \left(\frac{\partial}{\partial \dot{q}_j} \right) \cdot \left(\frac{r_i^2}{2} \right) - \left(\frac{\partial}{\partial q_j} \right) \cdot \left(\frac{r_i^2}{2} \right) \right] \right\} \cdot \delta q_j$, a difficult utilisation relation.

Remark: Virtual Work Principle is embedded in all Energy – equations, dependent or not in time, t , by using the two only basic elements of universe, that of Space, $dri = dsi$, and that of Energy = work $W = T + V$, Kinetic, T , and Potential, V , energy. Because Work is conserved by following Quantization process either as Energy and as Space or both and because is equal to $W = p \cdot dr = (mv) \cdot dr = m \cdot (v \cdot dr)$, (Not Evolution), so all its derivatives are conserved.

A whole analysis follows for energy conservation, by quantization in wavelength tiny energy volume for wave's case. Radiation of Energy is enclosed in a cavity of the tiny energy volume $\lambda = \left[\frac{4(w^2 r^2)^3}{3\pi} \right]$, (cycloidal) with perfect and reflecting boundaries and this cavity may become infinite in every direction and thus getting in maxima cases (the limits)

geometry ($\lambda \nabla$) and the source term energy ($d\bar{s}.dP = \lambda \Lambda = W$) with motion Λ imbedding in them all conservation physical laws with the only two quantized magnitudes, $\lambda, \bar{\Lambda}$ of Monad $\bar{A}B$ and equal to the angular momentum vector $\bar{p} = \Lambda = \bar{w}.\lambda = m\bar{v} = d/ds \{[A-B[P.ds]]\}$, and Time, T , to be the conventional factor, t , equal to zero. The three jointed cases of, ESM, Energy-Space -Monads are inter-transformed (converted) in space as follows,

$$E \rightarrow P\bar{A} > 0, dF > 0, ds = 0, P\bar{B} = 0, \rightarrow \sigma, \tau \neq 0$$

$$S \rightarrow P\bar{A} > 0, dF = 0, ds = \lambda > 0 \rightarrow \sigma, \tau \equiv m\bar{v}, P\bar{B} = 0,$$

$$M \rightarrow P\bar{A} > 0, dF = 0, ds = \lambda > 0 \rightarrow \sigma, \tau \equiv m\bar{c}, P\bar{B} > 0 \rightarrow \sigma, \tau = m\bar{v}$$

where $P = \bar{P}A =$ Force executed at point A of area dF , space $d\bar{s} = |\lambda|m =$ displacement of point A to B and equal to work done $= \int_A^B Pds$, and equal to main stresses σ, τ on area dF , and equal to velocity \bar{v}, t , is the conventional factor of time (t), and factor (m) \rightarrow mass = the reaction to the motion.

All bodies possessing mass and Elasticity are capable of vibration and are of two classes,

Free vibration takes place when a system oscillates under the action of forces inherent in the system itself with frequencies established by its mass and stiffness distribution.

Forced vibration takes place under the excitation of external forces in the system, and if the frequency of excitation coincides with one of its natural frequencies, a condition of <resonance> is encountered, resulting to any oscillation.

Periodic motion is when motion is repeated in equal intervals of time T (period of oscillation) and is designated by the time function $x(t) = x(t+T) = x = A.\sin(2\pi t/T) = A.\sin(2\pi/T).t = A.\sin.wt, \dots$

2.6. How Work Is Quantized and How Is in Equilibrium.

Work is conserved as, as the Universal Principle of Virtual work on Geometry Primary dipole, ds , law $W = \oint F.ds$, and as Energy is then Quantized, converted, in Space monads, caves, cells, $\bar{x} = d\bar{s} = \lambda m$, as pressure σ, τ , the pressure is converted in caves as a Standing Electromagnetic Wave E, P which consists the Standing monad (Displacement current) and the moving Energy monad (by altering the inner wavelength or Period of monad) in Gravity's field medium [MFMF] and is dissipated as Quaternion monads (Particles or Waves, matter or vectors) as Forces (displacements, masses, pressure etc.) using modulus, coefficients, reactions to the motion and all other geometrical indices. Part of W , is kept as Dark-matter-energy Heap which is Rolling with light-velocity on Gravity-field, causing the universe expansion.

Stability In-Out wavelength is obtained by the Isochronous Anti-Standing Electromagnetic Wave E, P which happens on Anti-cycloid, Evolute, and whirling, Curl, by the equality of the two transverse Complex Envelope displacements, Amplitudes, that consist the Standing monad (Coriolis force curl helix Displacement current in monads). [39-40]

The Work Quantization process to \rightarrow Energy and Space or both (Not Evolution) \leftarrow is as follows, [12, 40-41],

1. Work $W = P.ds - [ds=0, t=0, F \neq 0] \rightarrow$ Stationary Force

on zero Displacement and is transformed as,

2. Work $W = (\sigma.dF).ds - [ds=0, t=0, dF \neq 0] \rightarrow$ Stresses on any Area, and if area is zero then is transformed as,

3. Work $W = (c[\epsilon\mu]).ds - [dF=0, ds=0, t=0] \rightarrow$ Permittivity-Permeability of Electromagnetic field and is transformed as,

4. Work $W = (E \perp H).ds - [dF=0, ds=0, t=0] \rightarrow$ Inner Electromagnetic Wave of monad and is transformed as,

5. Work $W = (\lambda m).ds - [dF=0, ds \neq 0, t=0] \rightarrow$ Moving Field Vector and for $dF=0, ds \neq 0$ is transformed as,

6. Work $W = (p).ds - [dF=0, ds \neq 0, t=0] \rightarrow$ Angular Momentum of the moving field, and is transformed as,

7. Work $W = (h/v).ds - [dF=0, ds \neq 0, t=0] \rightarrow$ Cycloidal Spin, in wavelength λ , and is transformed as,

8. Work $W = (\lambda m).(v.t) - [dF=0, ds \neq 0, t=t] \rightarrow$ Kinematic Vector with mass and velocity, and is transformed as,

9. Work $W = (M).v.dt - [dF=0, ds \neq 0, t=t] \rightarrow$ General mass-Velocity moving vectors, and is transformed as,

10. Work $W = (p).dt - [dF=0, ds \neq 0, t=t] \rightarrow$ Linear Momentum.

a. The Work Quantization process as Energy is $W = P.ds = (\sigma.dF).ds = (p).dt$

b. The Work Quantization process as Space is $W = (c[\epsilon\mu]).ds = (E \perp H).ds = m.v$

c. The Work Quantization process as Energy and Space is $W = (\lambda m).ds = (h/v).ds = (\lambda m).(v.t) = (M).v.dt$

According to Pythagoras, \rightarrow Unit = ds is a Point without position while a Point = 0 and it is a Unit having position. What is a Point and what is a Unit is clearly defined.

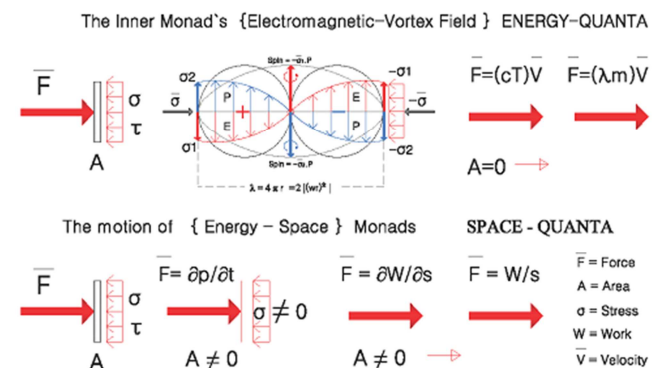


Figure 4. The Quantization of Work as Force (Energy) = [E, P].

RESULTANCE'S EQUILIBRIUM IN EVOLUTE - TRAJECTORIES

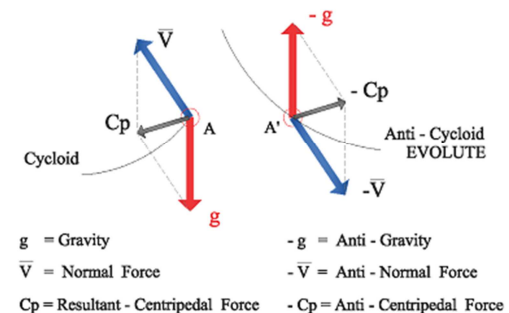


Figure 5. Equilibrium of the Resultant Forces, in the Cycloid and as motion Wavelength, and of any Removal Monad. The Intrinsic Space (Wavelength) = $[\lambda]$ and it is the energy quanta.

2.7. What is Gravity Field and what is Gravity Force .

It was referred that Fragments $s^2 = \pm |(\bar{w}.r)^2|$ occupying the minimum quantized space $|s^2|$ are deported and fill all [STPL] cylinder which is the Rest Quantized Field $\pm [(\bar{w}.r)^2]$ or it is, the material point in mechanics as the base of all motions, where force $[(\bar{w}.r)^2 \nabla i] = 2.[(\bar{w}.r)^2]$ is vibrating on length $2.[(\bar{w}.r)^2] = \lambda$ as a Stationary Wave, and creates the curl Electromagnetic Field $E \perp P$, on which is the Universal Quantized force called Gravity. This Gravity-Field $Gf = [E + \bar{v} \times P]$ is the unmovable, forced welded spinning dipole, $\rightarrow [+(\bar{w}.r)^2 \leftrightarrow -(\bar{w}.r)^2] = |\lambda| \equiv [\{A(PA) \leftarrow 0 \rightarrow (PB)B\}] \leftarrow$ and because jointed with force, means that Newton's laws issue in both, Absolute System [S] and Relative System [R]. The Gravity - Force is equal to $F_g = |\bar{q}|.[E + \bar{v} \times P]$ and is exerted on any movable particle with charge \bar{q} . Because elements $[\pm \bar{c}.s^2]$ of Dark-matter are heavier then Gravity-Force is equal to $F_D = |\bar{q}|.[E_D + \bar{v}.P_D]$.

2.7.1. What is Mass m .

Mass $m = (pr).w/v^2 =$ the meter of reaction to the motion and \rightarrow momentum $p = 2\pi(pr).[c/\lambda]$ the Anti-reaction \leftarrow and for $v = c =$ velocity of light, then Planck's equations for mass $m = (pr).w/c^2 = h.w/2\pi c^2$, and for momentum $p = h/2\pi\lambda$, where $w =$ Particle's oscillation frequency and that of caves' inner common circle which is constant, and, r , the rolling circle's radius. All waves oscillate with total energy $2E = p.v = [pr].w$, which awareness translational motion (pr) at light, c , and rotational at spin (w) motion in helical behavior.

The Work Quantization process occurs as this compound helical motion and is conserved in $<$ translational motion (pr) and rotational motion at spin (\bar{w}) $>$ wavelength of particles (monads) following all known physical laws.

Plane wave's Energy is stored as Stationary wave's Energy in the case (knot points) of wave Interference. [41]

2.8. What is a Material Point and a Sector, a Length, in Mechanics . Fig. 6, 7

It was referred what is point, sector and line in Euclidean geometry. The Material point (1) at Euclidean point (1), is now Breakage $\pm [(\bar{w}.r)^2]$ volume which becomes from that cave where quantized Point $= L_v = r = e^{i.(N\frac{\pi}{2})}.b = 10^{-N} = \infty$.

It is one of the two equal and opposite equilibrium elements in the Rest Homogenously and Isotropically Quantized, mass-less Field [PNS] in spherical volume $V = \frac{\pi}{6} [\pm (\bar{w}.r)^2]^3$, which consist in our Planck's confinement the required coordinate System and the base for all motions and forces in Gravity parallel inertial systems. This rest element in Space system [PNS] (is the Base) into the Medium-Field Material Fragment \rightarrow [MFMF] Field with the less space distance of diameter, $ds = |\bar{w}.r|^2$, which consists the Minimum Space -point -Quanta.

It was referred that Fragments $s^2 = \pm |(\bar{w}.r)^2|$ occupying the minimum quantized space $|s^2|$ are deported and fill all [STPL] cylinder which is the Rest Quantized Field $\pm [(\bar{w}.r)^2]$ or it is, the material point in mechanics, and the base of all motions where force $[(\bar{w}.r)^2 \nabla i] = 2.[(\bar{w}.r)^2]$ is vibrating on length $2.[(\bar{w}.r)^2] = \lambda$ as a Stationary Wave, and creates the curl Electromagnetic Field $E \perp P$, on which is the Universal

Quantized force called Gravity. The Gravity - Force is equal to $F_g = |\bar{q}|.[E + \bar{v} \times P]$ and is exerted on any movable particle with charge \bar{q} . Gravity - Field $Gf = [E + \bar{v} \times P]$, is the unmovable, forced welded spinning dipole, $\rightarrow [+(\bar{w}.r)^2 \leftrightarrow -(\bar{w}.r)^2] = |\lambda| \equiv [\{A(PA) \leftarrow 0 \rightarrow (PB)B\}] \leftarrow$ and because jointed with force, means that Newton's laws issue in both, Absolute System [S] and Relative System [R].

For Dark-matter, the Material point (1) at Euclidean point (1), is now Breakage $[\pm \bar{c}.s^2]$ volume which becomes from that cave where quantized Point $= L_v = r = e^{i.(N\frac{\pi}{2})}.b = 10^{-N} = \infty$, and it is the movable element in the Rest Homogenous and Isotropically Quantized, mass-less Field [PNS] in spherical volume $V = \frac{\pi}{6} [\pm \bar{c}.s^2]^3$.

The Material wavelength of two points (1),(2), or the sector $\lambda = (1)-(2)$ or the minimum energy Space of two material points as above is $\rightarrow \{ [\text{Medium-Field Material Fragment}] \rightarrow [\pm s^2] = |\bar{w}.r|^2 = [\text{MFMF}] \text{Field} \leftarrow \}$ the Electromagnetic Field $[\bar{E} \times \bar{H}]$ or the field $\rightarrow [+(\bar{w}.r)^2 \leftrightarrow -(\bar{w}.r)^2] = |\lambda| \equiv [\{ (1)(J=P1) \leftarrow 0 \rightarrow (J=P2)(2) \}] \leftarrow$ which is a standing wave in cavity (1)-(2), of the two scalar breakage $[\pm (\bar{w}.r)^2]$ as medium (1)-(2) field, and (J1) as energy at point (1) and carried to point (2) by following the cycloid motion from (1) to (2) with an isochrones Velocity, \bar{v} , and during shifting is analyzed into two velocity vectors \bar{v}_1, \bar{v}_2 , and which undergo vibrations causing two waves that represent the two Electric E, and Magnetic H, perpendicular components following the trajectory, $\text{in}=(c1)$, $\text{out}=(c2)$. On cycloid $= (c) = |(1)-(2)|$ is needed the isochrones time $T = \pi.\sqrt{Rc/g} = \pi/\lambda$ to reach end (2) $<$ Fermat's Principle of Least time $>$ and this because it is the Extreme $<$ Isochrones Principle $>$ which is embedded in all wavelength vector monads, and consists the Minimum Energy-dipole-Quanta i.e. the sector (1)-(2). Fig. 2, [39-41]

For Dark-matter wavelength of two points (1), (2), or the sector $\lambda = (1)-(2)$ or the minimum energy Space of two Dark-matter material points is energy field $[\pm \bar{c}.s^2] = [c.|\bar{w}.r|^2] = [+c.(\bar{w}.r)^2 \leftrightarrow -c.(\bar{w}.r)^2] = [c.|\lambda|] \leftarrow$ or the massive energy field. Force $[(\bar{w}.r)^2 \nabla i] = 2.[(\bar{w}.r)^2]$ is also vibrating on length $[\pm \bar{c}.s^2] = 2[c.(\bar{w}.r)^2] = 2\lambda$ as a Stationary Wave, and creates the curl Dark-Matter Electromagnetic Field $[\bar{E} \times \bar{H}] \equiv E_D \perp P_D$ on which is also the Universal Quantized force, Gravity. This heavier Gravity-Force is equal to $F_D = |\bar{q}|.[E_D + \bar{v}.P_D]$ and is exerted on any movable particle with charge \bar{q} .

So, Gravity force is the minimum attractive and bidding Force $\nabla i = 2(wr)^2$ on [MFMF] $\rightarrow [+(\bar{w}.r)^2 \leftrightarrow -(\bar{w}.r)^2] = |\lambda| \leftarrow$ and is the material energy length consisted of material points $[(wr)^2]$ which are the two $\pm [(wr)^2]$ dipole and restrained by the above Electromagnetic field E, P becoming from the binding force $[2(wr)^2]$ and having the equations,

$E = 2A.\sin kx.\cos wt = \sqrt{2}.[(wr)^2].\sin kx.\cos wt$, $P = 2A.\sin kx.\cos wt = \sqrt{2}.[(wr)^2].\sin kx.\cos wt$, in our Planck's confinement cave, and which interact with all other particles. Since acceleration $a = d\bar{v}/dt = (d\lambda/dt).f$, and analogues to wavelength, λ , and to frequency, f , then for, $\lambda =$ any constant (or zero), then $\bar{v} \rightarrow 0$ and $f \rightarrow \infty$. This is the why the very strong gravitational fields are present and close to black holes where there $\bar{v} = \bar{c} = 0$ or any constant. [40-41].

The motion of this DM, DE, mixture of the spherical

opposite signed materials and dipole energy sector volumes, is not in contrary to gravity force, because both have already passed from the center of STPL contracted mechanism. Gravity field is the Rest base of all universe which doesn't exist apriori but continually created as above and is the Base, carpet, on which the Dark-energy-Dark-matter heap mixture, with light velocity, \bar{c} , is rolling, expanding, with the maximum constant, c , and continually formulating the, Zero \rightarrow Discrete \rightarrow Infinite Geometrical Universe.

General Relativity by accepting space-time a Priori is as accepting the two elements, Space and Time, as the fundamental elements of universe without any proof for it, so anybody can say that this stay on air and needs a proof. It has

been proofed [22-26] that any space AB is composed of points A,B which are nothing and is in equilibrium by the opposite forces $PA = -PB$ following Principle of Virtual Work. In mechanics, Law of virtual work, is not based on time so, Time (t) is the conversion factor between the conventional units (second) and length units (meter) and has not any other essence and purpose. By considering the moving monads (particles etc. in space) at the speed of light, that then pass also through Time, this is an widely agreeable illusion.

THE INNER MONAD STRUCTURE \downarrow :

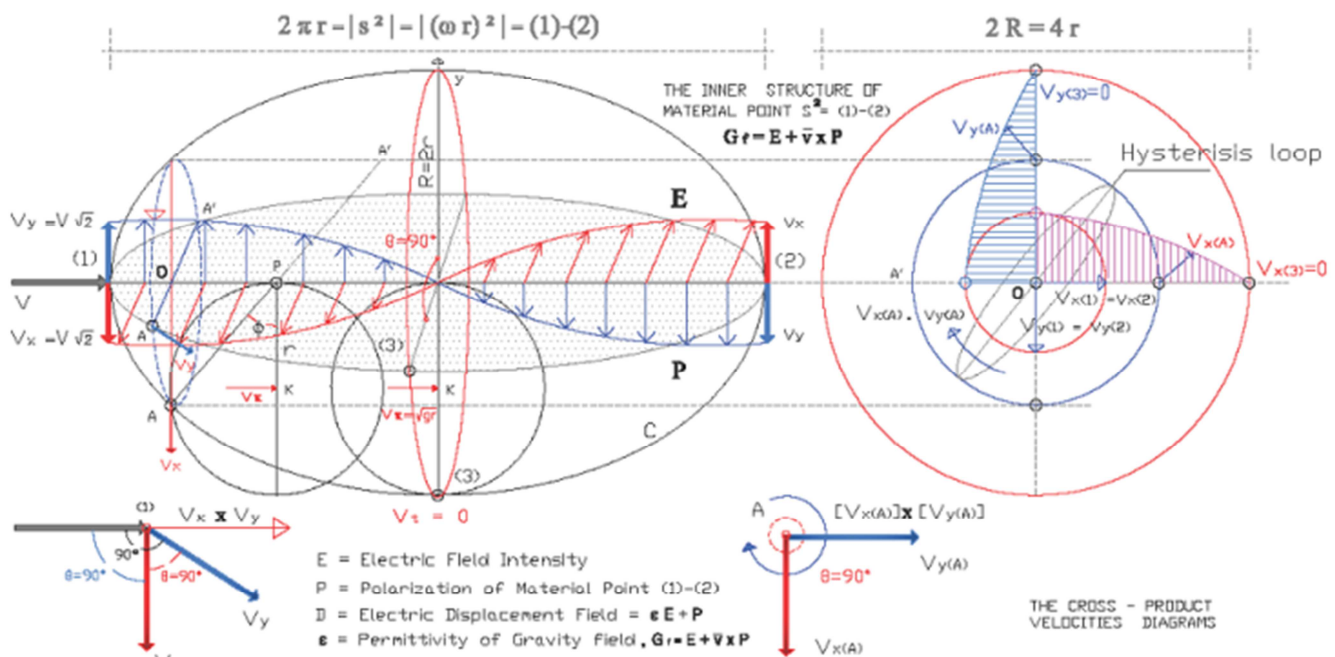


Figure 6. The Stationary Velocity's wave-length, $|V|=\lambda$, as the Intrinsic Electromagnetic field $E \perp P$ and for Gravity $\lambda = s^2 = |(wr)^2$.

2.9. What Are the Geometrical Caves and What Are the Energy-Magnitudes.

All particles are characterized by their quantized cave the Space $[V = 4\lambda^2/2\pi = 4(w^2.r^2)/2\pi]$ composed of an inner Electromagnetic wave constituent $[E \perp H]$, and $h = 2\pi/\lambda$, is the reaction to these velocity motions [it is the mass $m = (pr).w/c^2 = h.w/2\pi c^2$], the external energy momentum $p = h/2\pi\lambda$ and Spin (the helically rotating electric field vector corresponding to a circularly polarized Electromagnetic wave propagating with attenuation to the right). Conservation laws of energy linear and angular momentum are satisfied by the inner Anti-cycloidal motion, (on the evolute curve).

This interpretation of caves when applied to Young's interference and Polarizer experiments is shown the unified understanding between the classical Electromagnetic field and the quantum particle of light.

This tiny energy volume for wave's case, is the Cycloidal volume $V = 4/3.\pi.ab^2 = 4\lambda^3/3\pi$, [because $a = \lambda$, $b = \lambda/\pi$] of the Electromagnetic stationary field $[E \times H]$ where Intensity $Sc = [\epsilon.E^2/2 + \mu.H^2/2]$ and ϵ, μ the Permittivity, (the Dielectric

constant multiplier), Permeability (the Dielectric constant multiplier).

Electromagnetic waves are able to transmit energy through a vacuum (empty space) by storing their energy in a Standing Transverse Electromagnetic dipole wave as above, and thus considered completely particle like, and in transverse interference pattern to be considered as completely wave, so when Energy Intensity is,

a. Energy $I_d = \frac{\rho\pi c^3}{2\lambda^2} [\epsilon E^2 + \mu H^2]$ in volume $V = \left[\frac{4(w^2 r^2)^3}{3\pi}\right] \rightarrow$ Energy behaves as Particle like,

b. Energy $I_d = \left(\frac{\rho.c}{2}\right).(wA_0)^2$ in any Interference Pattern \rightarrow Energy behaves as Wave like, Discrete

This is the Wave-Particle duality unifying the classical Electromagnetic field and quantum particle of light.

The correlation of Philosophy (PH), Euclidean Geometry (EG), Mechanics and Physics (M & P) and the New Hypothesis (NH) is modified in columns as follows in Figure-7.

Philosophy (PH)	Euclidean Geometry (EG)	Mechanics - Physics (M - P)	The Creation Hypothesis (EXPAÑOBB)
CHAOS	Point (0)	Schwarzschild radius $r_g = 2Gm/c^2$	Point $\rightarrow Lm = e^{i(N\pi/2)b} = 10^N \bar{N} = \infty = 0$
→ EREBUS	Straight Line $(-\infty, 0, +\infty)$	A Cloud for $-\infty$ and for $+\infty$ a web extended constituents	PNS \rightarrow Spaces, Anti-spaces, and Sub-spaces in all Sub-spaces
BLACK - NIGHT	Numbers $\pm (1, 2, 3, N)$	Entropy of invisible particles or Fluctuation of particles shape	Discrete Energy Monads $A_i - B_i =$ The Work = Quaternions in the tiny volumes of $V = \frac{4\lambda^3}{3\pi} = \frac{4(w^* r^*)^3}{3\pi}$
→ BORN	The different Homogeneous Coordinate Systems [A]–[R]	Big - Bang Theory	The Geometry mould, STPL Mechanism on tiny caves, is producing the material Points Sector and Particles
→ EATHER	The Non - Euclid geometries	The fluctuation of Spacetime <i>Quantized force $\nabla i = 2 S^2$ of Cave radius, r, and w, vibrating on length $[+ S^* \leftrightarrow - S^*] = \lambda$ and creating on dipole, λ, the Stationary Electromagnetic Wave, the Field $E \perp P \{[(1)(J=P1) \leftarrow 0 \rightarrow (J=P2)(2)]$ of [MFMF] Base. (the gravity of inner velocity wr)</i>	<i>The Minimum attractive and binding</i>
→ DAY	Quaternion	Rest and Moving particles	<i>Moving or Rest Particles and Anti-Particles, Gravity Field and Gravity Force, Dark Matter and Dark-Energy, Atoms, Molecules and Bodies following Chemical laws in physical laws and everything derivative in this Cosmos.</i>
T-0			

Figure 7. The Philosophical, Geometrical, Mechanical-Physical and the Contemporary Creation Hypothesis.

3. The Comments in $\{*\{Italics\}*\}$

Aethergy is a motionless substance, a mixture of aether and kinetic energy, $\{*\{Considering Aethergy motionless and having also kinetic energy, Aethergy is accepted to be as a Quaternion $q = a + (i)k$ of Real part, a , and Imaginary, ik , $\}*\}$ distributed uniformly all over the universe $\{*\{uniformly distribution happens because breakages $[\pm s^2]$ being dipoles are restrained by the inner Electromagnetic field $[E \perp H]$ of gravity forces $\}*\}$ and having the property of forcing any mass in it to move like in a spontaneous reaction, separating aether, a , from kinetic energy, k . Neither a nor k , are manifested as such until their mix, $a-k$, comes into contact with mass while the separation of a from k is causes aethervortices. $\{*\{a-k$ is Gravity's Quaternion, q , as the definitions above and is not happening separation of, a , from, k , because, k , is the Inner Electromagnetic field joining the opposite dipole breakages $\pm s^2\}$ $\}*\}$. Does surrounding aethergy, $a-k$, comes in to fill in the gap, implying that it moves too, even for a fraction of an Instant? The answer is negative. What happens during that fraction is that the released aether transforms the non- k energy produced by the mass into k , absorbing it and restoring aethergy's spatial continuity. $\{*\{a-k$ is Gravity's Quaternion consisted of dipole breakages $[\pm s^2]$ side by side and are the minimum Quantized Energy, $Quanta, 2s^2$, of our Planck's confinement and so gap is not existing because this becomes the wavelength of Gravity field, and as prior referred for, material point, it is spatially diffused in all quantized spaces $\}*\}$. But, what kind of energy is the non- k energy? To answer this question a working definition of the terms "mass", "matter" and "non- k " energy is needed. A$$

mass is a physical body, and a physical body is made up of two distinct substances, matter and non- k energy, m and e , incapable of forming a body, $m-e$, by themselves separately, and manifest able as such only upon contact with $a-k$. $\{*\{Mass m , is not a physical body but that consistence factor measuring the reaction of the body to its motion and it is a scalar magnitude. The external energy momentum $p = h/2\pi\lambda$ and Spin is the helically rotating electric field vector corresponding to a circularly polarized Electromagnetic wave propagating with attenuation to the motion. The non- k energy belongs to the stability reaction of the outer Electromagnetic field of the body with the inner Electromagnetic field of gravity. The Stability reaction of the inner Electromagnetic field of the wavelength is obtained by the inverse Anti -Electromagnetic field following the Conservation laws of energy, linear and angular momentum satisfied by the inner Anti-cycloidal motion, (the non- k energy is the Anti-Electromagnetic field on the equilibrium evolute curve on the balancing cycloidal field wavelength). $m-e$, is another one particle with charge, q , contacting with the rest gravity field $a-k$. Here is referred that all constituents of, the after Born mechanism, contain all prior constituents which are the two only components and all of Erebus Equilibrium and all physical Laws of opposites - the smaller caves and constant velocity, c , greater than that of light - e.tc. Black-Night properties, the Quantity and Quality of particles dependent on Thrust -the Motion of particles due to Centre or Circumference of Common circle - etc., is the Point which is nothing and, the Work which is the Energy as above in all its transformations, i.e. the Energy-Space Universe and not the Space-time universe. $\}*\}$ [39]$

To justify this definition and answer the question posed,

the question: “Why should a and m be mixed with energy in the first place”, should be answered. We must imagine them as two kinds of substances, which are unable to interact with each other by construction. A third kind of substance is required to accomplish this task: A substance, which is common to both of them and hence, mixed with them; and a substance, which at the same time is distinct and hence, of a different form. If the third substance in each mix were the same, the mixed entities would be as unable to interact as a and m are by themselves. The same if the third substance were not the same. The “bridge” is “common and yet distinct”, and that's exactly what energy serves by being common to both a-k and m-e, and yet distinct with k exclusively mixed with a, and e exclusively mixed with m. *{*{a-k and m-e consist two different quaternion, the first belonging to the rest Gravity field and the second to any rest or moving particle or body, therefore the two quaternion interact with each other, either directly or indirectly, so no third kind of substance is required }*}*.

Now, there is a kind of mass, self-existent but also in all physical bodies, such that the e in its mass bond m-e may completely change to m-k right upon contact with a-k, regardless of the self-existing or co-existing in a greater body character. It happens so because it is the kind of mass with the least efficiency loss in transmuting k to non-k energy, and runs exactly with the speed of light, c; it is a kind of “swift” so to speak, particle. Letting $E=k+e$ and M be denoting total energy and mass, respectively, $E=Mc^2$ and $k^*=1/2Mc^2$ is the case with the swift particle, implying that the remaining $1/2Mc^2$ is potential energy, force field. It is induced by the replacement of e by k. *{*{mass m is the reaction to the motion either is the intrinsic motion of monads (cycloidal and anti-cycloidal motion of v_1, v_2 for stability in monad) or the outer, since it is a conversion factor (as this happens also for time). Energy, k, which is the gravity's inner Electromagnetic field is balanced by the opposite anti - Electromagnetic field which is created on the cycloidal evolute without any loss of energy. Energy is added to energy so $E = k+e$ and since the reaction to the motion is, energy and mass together, the generalized mass M then Lagrange's equation of energy $E=Mc^2/2$ becomes for oscillating energy $2E$, $k^* = 1/2Mc^2$ }*}*. What kind of a force field? The instantaneous change of the e of the swift particle to k must be owing to its chemical structure and hence, we have a Charles Augustin de Coulomb (1736-1806) force field. Aether “specializes” in the transformation of this kind of potential energy back to k in the sense of doing it with zero efficiency loss. Consequently, aether transforms into k exactly the amount of k, $1/2Mc^2$, aethergy lost to the swift particle; and by absorbing it, aethergy's spatial continuity is restored. We have in operation the minimum energy principle in mutual connection with the least-efficiency-loss mass. And, all this takes place “automatically” at a fraction of an instant.

{{As prior referred gravity field [MFMF] is an ocean composed of Infinite oscillating energy dipole on tiny breakages [$|\pm s^2| \equiv [+(\vec{w}.r)^2 \leftrightarrow -(\vec{w}.r)^2] = |\lambda|$] in a least*

cycloidal quantized cave the Space [$V = \frac{4\lambda^3}{3\pi} = \frac{4(w^2r^2)^3}{3\pi}$] composed of an inner Electromagnetic wave constituent [$E \perp H$], with $h = 2\pi/\lambda$, and the reaction to these velocity motions [i.e. the mass $m = (pr).w/c^2 = \frac{h.w}{2\pi.c^2}$], with the external energy momentum $p = \frac{h}{2\pi\lambda}$. Simultaneity, Homogeneity, Continuity is succeeded not because of the constancy of light, but of the dipole rest continuity cycloidal inner motion of the Gravity [MFMF] field. Aether, a, doesn't transforms into, k, exactly the amount of k, $1/2Mc^2$, of the aethergy lost to the swift particle, because the outer equilibrium Electromagnetic field of the particle is on its energy wavelength and balancing happens, on outer cycloidal evolute curve, the anti-field as in F-4 }}. [41]*

Does the swift particle exist by itself as we asserted a few lines earlier? Perhaps, yes, perhaps, no. The essence is that it co-exists with any greater body, and it will do run with k^* upon the contact of the body with aethergy. But, not all of the body consists of swift particles and the remaining part of it will move with $k < k^*$ under a force field which may not necessarily be a Coulomb one. And, the total aether released may not be able to transform all potential energy back to k, because aether's specialization in Coulomb fields is equivalent to positive efficiency loss when the transformation of other kinds of potential energy is at stake. *{*{Aether, a, is not released because is the motionless tiny breakages [$|\pm s^2|$] tied together by the Gravity's Electromagnetic field [E,H] and because of Work conservation, never gets less or more }*}*. There will do be such losses in connection with the intermolecular force surrounding thermal energy prompting the workings of the second law of thermodynamics: Minimum energy principle in operation with regard to the swift particle, but maximum entropy principle with respect to any other type of mass, totaling to the second law of thermodynamics, but in a way disturbing the uniformity, the density of aethergy, and disrupting the equilibrium of the system, unless there is a built-in stabilization mechanism. If the system was the outcome of some big bang, this mechanism should be one providing smaller big bangs constantly. *{*{Aether density is constant as above and gravity's system is not the outcome of any Big-Bang which has never been existed. The Energy radiation system of particles issues after STPL mechanism and maybe represented in Space by the three states of interaction or and positions a) The position of the particle by means of any system to general coordinates or in Cartesian coordinates b) The state of radiation field is determined by the values of the components of the Electric and Magnetic vectors at points of the space, or the field by means of a scalar and a vector potential (the values of scalar potential as above) and c) The action of the Particle as a whole on this inside Field (the coupling energy of the inner constraints with, evolute) and the action to its outer environment. Maximum Entropy principle is respondent with respect to any other type of masses and energy and is not disturbing the density of gravity field. }*}*

The big bang incited the greatest etherovortex of all times;

this is actually what it was. But, smaller ones, small big bangs may be incited any time by the accumulation of small vortices. More precisely, vortices disarrange the spatial distribution of aethergy. The accumulation of disarrangement may lead by itself to a powerful vortex, which only secondarily could be attributed to motion of mass, because it is the indirect cumulative effect of the relatively weaker vortices from such motion. The scale of the secondary effect may be so large as to reverse the causality running from motion to vortex. Such powerful vortices are the sources of new ethergy production and the cause of a movement of masses toward them, swallowing them, and creating small Creations upon contact with the new Ethergy. If equilibrium is the case, the time-scale of these workings is infinitesimal, because they are such as to be preserving ethergy “density” unchanged. *{*{Big-bang never incited in this cosmos because of all above referred reasons. Sequence that in this cosmos Space was created before matter → the answer is that Human mind, in front of this dilemma created the outlet in Religious and the Myth of Big-Bang. The accumulation of disarrangement may lead by itself to a powerful vortex is right, because Space Anti-Space being the first disarrangement lead to infinite small vortices which by entering in geometry caves existed as the Sub-space Common Circle [13, 28]. The stationary Gravity field $[\pm s^2]$ and because of opposite \pm dipole, is wave with inner Electromagnetic fields E, P as other particle. The Dark matter $[\pm \bar{c}.s^2]$ breakages where also exist opposite \pm dipole, is wave with inner massive Electromagnetic fields E, P as other particle and moving Dark energy $[\bar{c}.V_i] = c^2$ is composed of light velocity $c = v$ or $c > v$ and is acting on all Five Fragments with light velocity, \bar{c} , therefore their particles are made of heavier than those of other particles. Clusters of galaxies by merging become increasingly larger and because of wave nature, any energy released by their systems is much bigger than all others. [43]. Causality running from motion to vortex is the phenomenon of Young’s double slit Dark fringes where moving energy is then concentrated in energy wavelength as property of particles, as waves, and it is the same which happens to the hedgehog in its cave.}*}* [41], Fig. 7.

Etherovortices revive masses too, but how do they do it exactly? Let us go back to the m-k structure in connection with the swift particle. k comes not to destroy the bond m-e of this particle, but only to take the place of e. This exactly is what revives, namely the replacement of any in general non-k energy by k. And, this exactly character of the bond of the swift particle is what makes this particle be the one with the least efficiency loss and with unaffected by motion age. For the other forms of M, age change depends on the extent of bond change brought about by the above considerations, which change m-e to m-e-k. The faster a mass is capable of moving, the greater it means its ability to “absorb” k, and the less the change in its bond, or according to the terminology used until this subsection, the less the change in its hypostasis. Responsible for hypostasis change from the viewpoint of its manifestation as constant discontinuity is the

automatism of aethergy’s workings that is needed to maintain its own continuity. *{*{Etherovortices m-e doesn’t revive masses because with a-k consist two different quaternion and so Aether density a-k is constant and being also a separate gravity’s system is not changed to m-e-k or, k, or be absorbed. The m-e is a separate particle with constant work which reacts only with the others and absorbs or gives energy while with a-k is only reacting. Generalized mass M of m-e is not changed to m-e-k but to M.e}*}*

In other words, as far as overall system equilibrium is concerned, the continuous transformation of the structure of m-e is needed to maintain a-k unaltered under of course the regulation of the system by the small big-bang mechanism. Put differently, a continuum of irreversible, irreproducible, unique m-e’s is needed to sustain an a-k eternally. Or, of course, vice versa; mutuis vis viva. The totals of all substances would remain fixed at the pre-interaction and hence, equilibrium levels, which in turn equilibrium wants energy to be at its minimum but entropy to be maximum given the constancy of total energy. And, since there can be no other quantities of the substances than the pre-interaction ones, these quantities would be the maximum ones too, rendering the quantifications “max-min” superfluous in the description of equilibrium: A system is in equilibrium when both energy and entropy are at equilibrium. Fixing also energy and entropy at their equilibrium levels renders superfluous the distinction between closed and isolated systems.

{ Following the above definitions, m-e is not needed to maintain a-k because the independent particles (m-e) have velocity, while gravity base a-k is a Rest material and only the inner velocity of the confined Electromagnetic field $[E, H]$ exists in the tiny dipole breakages of their Energy -Space. Entropy is the intrinsic energy of $[E, H]$ Electromagnetic field of gravity base and the velocity vector for particles}*}*.

To conclude, a greater speed than that of light is the one that would move the traveling substance from the one end of the universe to the other at once. But, then the substance would not be traveling, and the speed would be no speed but kinetic energy. The substance would be distributed uniformly everywhere in the universe, waiting to unleash the tremendous kinetic energy responsible for such a state of the cosmos. This is why there has to be aethergy; because there has to be speed greater than that of light for some kind of substance; speed, in terms of mass, but kinetic energy, in terms of this substance. A substance, which is not mass, because the most mass can do from the viewpoint of k, is to become a swift particle. A substance for which the speed of mass is not the conjunction of two separate entities, speed and mass, but kinetic energy intrinsic to the substance, as intrinsic as non-k energy is to mass.

{{A greater speed than that of light is obtained in caves smaller than that of Planck’s where then exists only the rotational energy, Torsional Momentum greater than that of Planck’s, The [STPL] line-cylinder as the passage of particles from Absolute [S] Frames (the cave) to all Relative [R] Frames, is the Navel cord, the string of galaxies either*

for Spaces, Anti - spaces or for Subspaces, the monad in monad. Here we have to clarify that the substance is the Work, which is traveling as, Work Quantization process, speed and kinetic energy in all types. This substance is not distributed uniformly everywhere in the universe, neither is waiting to unleash the tremendous kinetic energy, but is confined in its wavelength or in a smaller tiny volume as above. Here exists a confusion to basic definitions to what is mass (it is a consistence factor) and what is energy or work (it is the ability to do some work). Infinite velocity exists only in PNS, as this prior referred.}*}

In the ninth, 1878, edition of Encyclopedia Britannica, James Clerk Maxwell (1831-1879) was writing about the energy of light in the lemma for "Ether" (pp. 568-572) that: "If we adopt either Fresnel's or Maccullagh's form of the undulatory theory, half of this energy is in the form of potential energy, due to the distortion of elementary portions of the medium, and half in the form of kinetic energy, due to the motion of the medium." By the term "medium", Maxwell means the aether, having earlier in this lemma dismissed the material hypostasis of it. But, as we saw, half may be potential and half may be kinetic energy if a substance does have material hypostasis: $E=2k$. Of course, professor Maxwell was unaware of this relationship, but he does seem to be expecting developments on the concept like those presented earlier here. {*{Maxwell is correct in his conclusions and is the first who saw the Electromagnetic Displacement current in monads in magnitude below $L_v = e^{i(\frac{N\pi}{2})b=10^{-N} = -35}$ m. Euclid and Zenon [15] was the first who saw magnitude of Point as $L_v = e^{i(\frac{N\pi}{2})b=10^{-N} = -\infty}$ m. The undulatory theory, with half of this energy due to distortion of elementary portions of the medium in the form of potential energy and the other half in the form of kinetic energy is Right only when happening in the same Medium. Maxwell, by conceiving Displacement current into Empty-space, was aware of the Work Quantization process to Energy and Space or both, Gauss' and Ampere's law for continuity in a tiny volume, but was simultaneously confined in Planck's length.}*} [29. 41-44].

Towards A Creation Hypothesis

From Chaos came forth Erebus and black Night; but of Night were born Aether and Day, whom she conceived and bare from union in love with Erebus... Hesiod, Theogony, (c. c.700 B.C.). Hesiod's Theogony does connote to our physics: In the beginning, there was Chaos, a world in which events were inconsequential and nothing sensible could be made out of it. For example, static electricity would appear temporally before rubbing amber with fur, or spatially somewhere else; and in the place of static electricity nothing or a nuclear blast from some other faraway interaction might be experienced. It was a chaotic world, because there was no time to preserve the sequencing of events, thus depriving the nexus cause-effect of its spatiotemporal dimension. All was random, all was incidental. There was no time or for that matter, anything else that would ensure what comes first and what comes second. Matter phenomena were independent from energy phenomena. In such a world, mathematics did exist, but the

lawlessness of physics and chemistry was delivering chaos.

{*{For Hesiod, came is The Work Quantization process to → Energy and Space or both}*}

{*{CHAOS → is the Primary Point, A, the non-existence, from which came forth, (through Virtual work), [9]

EREBUS → is the Space [S], Anti-space [AS] equilibrium, the existence of PNS, with infinite points having a \pm

Charge with $P = 0 \rightarrow P = A \rightarrow \infty$ which is the Continuity of points and the Discrete of monads following the Euclidean geometry logic. The Non-existence Exists by Becoming, A to its anti-point. In this state Time, t, is not existing and $t = 0$. [20]

BLACK NIGHT → is the property of stationary Points to exist as caves, ds, following geometry moulds, In caves → Opposite velocities are crushed which defines the motion, and thrown OFF the cave through the Six-Triple -Points-Line [STPL] Mechanism, (STPL is a Mechanism where Opposites co-exist). Time, t, is not existing, so $t=0$. [17]

BORN → is [STPL] Mechanism, a Geometrical mould where Spaces, Anti-spaces, Sub-spaces contribute on a common circle and produce particles and, which is the Navel cord, the string of galaxies in all universe as separate monad.

AETHER → is the Gravity's Rest Medium-Field of Material-Fragment [MFMF] Field, and which Gravity dipole Field is connected by the Gravity Force, the binder in which Time, t, is Periodically, T, i.e. Eternal, this because of the Internal Electromagnetic field of the Gravity Field, (and since $\sigma = 0$ then conserve and, q, is not created-not destroyed).

In Ether is included, Dark -matter and Dark-energy which are → the continually Moving with the light constant velocity, c, and is a Heap, composed of the two opposite signed elements separately and that of their Energy mixture connected by the Gravity Force, with Dark-energy as Thrust continually effecting on the Five +5 particle fragments separately and slinging them further. Thus is formulated the attracting mixture of the spherical opposite signed heavy and massive highlights elements, and the invisible Dark matter dipole connected with the Gravity's Electromagnetic Field which repel. The parallel motion of this mixture is not parallel universes but the rolling of the moving mixture on the rest Gravity Field, not expanding into, of moving mixture on the continuously moving Gravity field as the Base of expanding and, DAY → are the moving or not Particles Fermions-Bosons and Anti-particles with The Dark-matter and the Dark-energy in Chaos. Particles and others are different monads which follow Physical laws between them in the whole.

CONCEIVE AND BARE from union in love with Erebus → is, The Equilibrium, the joint, of Particles-Anti particles in Spaces, Anti-spaces and Sub-Spaces following all laws of nature in PNS = (Primary Neutral Space) [27-28]. i.e.

Hesiod conceived Creation Hypothesis, with the then existing Instruments, and later centuries Euclid transformed, this idea in Euclidean geometry. In my articles is shown the tightness of Mechanics and Physics with Euclidean Geometry analytically and in this also is shown the tightness of Mechanics and Physics in Philosophy.

Neither Hesiod nor Euclid defined the Born Mechanism (i.e. the How is created Aether and Day) which is the most important Geometrical mould in this universe and it is [STPL] Geometrical mould on cave where Spaces, Anti-

spaces and Sub-spaces co-exist on a common circle and by composition of opposites produce particles and send them OFF mould in the line-cylinder and the Relative Inertial Frames. Chaos, Erebus, Black-Night are timeless i.e. $T = 0$,

Born mechanism and Aether are Stationary but because of the internal Electromagnetic tiny volume, time, t , is with period $T = \infty$ i.e. Eternal, In the moving Dark-matter and Dark-Energy Time, t , is of all types, $t = T = \infty$, $t = t$, $t = 0$, while Day is moving, and the meter time, t , is the conversion factor of changes.}}. [16-17-18]*

But, next, Day, i.e. light out presumably of a thermal source, and Aether, were born from the love, i.e. spontaneous reaction, Big Bang, between Erebus, i.e. matter, and Nyx, the perfectly black night, i.e. a substance having withheld all energy and hence, having the blackness of a black, which cannot be found anymore in nature. That is, Chaos was followed by a separation of matter from energy through the creation of such a substance, aiming at maximizing thermal disequilibrium and giving rise to a Big Bang. That substance is the aethergy, whose spontaneous reaction with matter made matter move, separate aether from kinetic energy, and develop out of this energy light-producing non-kinetic energy... According to Orpheus, Night, rather than Chaos, is the first principle.

Aether is the substance ordering universe as described by our physics, which now may be completed as follows. The process under the small Creations, mentioned in the end of the last Section, regenerates the perfect black or at least darker blackness than the rest in nature and hence, this type of vortices may be called black warps, reflecting at the same time this term the abrupt disruption in the spatial distribution of ethergy. Black warps are the primary source of new ethergy and matter, keeping the overall system in equilibrium. Without them, which separate Nyx from Erebus again and again, all cosmos would be tending to become ethergy, Night...

Wherefore also these Kinds [elements] occupied different places even before the universe was organized and generated out of them. Before that time, in truth, all these were in a state devoid of reason or measure, but when the work of setting in order this Universe was being undertaken, fire and water and earth and air, although possessing some traces of their known nature, were yet disposed as everything is likely to be in the absence of God; and inasmuch as this was then their natural condition, God began by first marking them out into shapes by means of forms and numbers..

{}{The next Day is for Particles to follow the laws of Inorganic and Organic Chemistry to form Atoms, Molecules, bodies etc. embedded in Gravity-Field and in Spaces-Anti-spaces and Sub-spaces. Laws follow Mass conservation which is Energy conservation and which leads to equilibrium and energy-quanta of the Definite and Multiple Proportion. The definition of, separation of matter and energy is wrong, because matter is a conversion factor and nothing else which was not existing apriori. Above analysis defines a Space-Energy universe as in [39] and not a Space-time universe. Orpheus is wrong conceiving Night = Caves = Volume as the*

first principle and not Chaos which is Primary point and Erebus the second. It has been clearly shown that, Time is designated as the meter of changes, or as the conversion factor, between time (second) and space (meter) units and not essence of Space-energy Configuration. Time exists only in motion which issues only for moving particles (Day).

Energy equations of Virtual Work issues for Rest Spaces, for equilibrium of opposites in caves and monads and do not need time because $t = s / v$ and inner motion is periodical with $T = 0$ for Time-less space and $T = \text{constant}$ or infinite, Eternal, for fields. This age-old question, of what is time, was standing for many centuries in Philosophy, and has been recently adopted by GR by considering Time as an essence of Space-time and thus confined in an eternal adventure of nothing, and accepting also the wrong base on which are Non-Euclidean geometries without elucidating the base of its Physical-content at the beginning [17], [38]}}.*

Plato (Timaeus, 17)

Indeed, myths appear to be are truth in the form of allegories and fairy tales. They seem to save phenomena when the knowledge about them vanishes from memories when socioeconomic and political circumstances dictate so, when adjustment to such priorities changes individual and collective priorities for a long time. Myths save phenomena sociologically but wisdom problems like the triad Quadrature-Doubling the Cube-Trisection, predispose towards the rediscovery of this knowledge.

The three Milesian philosophers, Thales, Anaximander (c.610-c.546 B.C.), and Anaximenes (585-528 B.C.), suggest that the pre-Creation world was boundless. If this were so, indeed, then according to this manuscript, here, one more perhaps characteristic of the Creation was to endow space with finiteness. There is a transition in ancient Greek thinking from Chaos to Apeiron; both are connected with the infinite, and it seems that Apeiron is the ordered one whereas Chaos connotes disordered infinite. The Creation according to Milesians, put some good order to the infinite, and I maintain that one more characteristic of this order was the finiteness of the infinite of space. One striking resemblance of my theory here with the position of the Milesians about the origin and character of the cosmos, is that “genesis and decay”, small creations, small big bangs, according to this monograph, will never stop. Aristotle explains that it is in this temporal nexus that the notion of apeiron was held by the Milesians. Nothing is going to happen to the cosmos for as long as its “batteries” of small creations work, indeed.

{}{Wisdom tetrad problems, Quadrature (a trial in [8]), Doubling the cube (a trial in [10]), Trisection (The solution in [11]), The Parallel Postulate (The solution in [9-32-38]), predispose the right direction for acquiring the Euclidean logic. The three Milesian philosophers define Chaos is the Apeiron, the very great or big or long, and in this way it is Erebus, which is a step after Hesiod. The good order to the infinite in Black night and has to do with, genesis and decay, two steps after chaos. Aristotle with temporal nexus is referred to Aether and Day.*

The Platonic position, Nothing can exist if it doesn't

contain continually and simultaneously the limited and the unlimited, the definite and the indefinite, is right because thus is referred to Erebus, approaching to Chaos and because all existence is incorporated in all substitutes of point (space) and energy (the equilibrium of space).

Pythagoreans trying to find the incommensurability of numbers were confined in Black-Night and thinking

that numbers is the essence of universe. Only Hesiod philosophically conceived this outstanding reality.*}

Moreover, these considerations appear to make justice to Pythagorean and Platonic position that: Nothing can exist if it doesn't contain continually and simultaneously the limited and the unlimited, the definite and the indefinite (Plato, Philebus, 16). Unfortunately for the Pythagoreans, it was too early to find out that this is the context within which empirical content is conferred to the incommensurability of numbers, which they had discovered. For us here, in empty space, numbers do constitute Platonic forms. But, in the space filled with a-k and m-e, uniqueness, irreproducibility, irreversibility of events implies that only number one exists in Cosmos. It is a different matter if man needs the Arithmetic, Mathematics, and Geometry to study the Cosmos. The truth is that it is a numberless and timeless Cosmos. And, the only Platonic form left to speculate upon outside Plato's Cave in an Aristotelian fashion, is the "Archer", (Αρχή).

4. Conclusions

1. The Properties on < Creation Hypothesis > of the Euclidean Space-Energy Configuration Geometry [39-41].
2. Primary Point is nothing and is the only Space [→Chaos]
3. Since Primary point, A, is the only Space then on this exists the Principle of Virtual Displacements (the How is this principle)
4. $W = \int_A^B P \cdot ds = 0$ or $[ds \cdot (PA + PB) = 0]$, i.e. for any $ds = \text{vector} > 0$, Impulse $P = (PA + PB) = 0$ and $[ds \cdot (PA + PB) = 0]$,
5. Therefore, Each Unit $AB = ds > 0$, exists by this Inner Impulse (P) where $PA + PB = 0$. → i.e. The Position and
6. Dimension of all Points which are connected across the Universe and that of Spaces exists because of this Static
7. equilibrium and Inner Impulse, on the contrary should be one point only (Primary Point A = Black Hole → $ds=0$
8. and $P = \infty$), as the repellency of A, B points by (PA) , (PB) forces $\leftrightarrow [\{A(PA) \leftarrow 0 \rightarrow (PB)B\}]$. → [17, 22]

All points may exist with $P = 0 \rightarrow$ (PNS) and also with $P \neq 0$, ($PA + PB = 0$), for all points in Spaces and Anti – Spaces, therefore [PNS] is self-created, and because at each point may exist also with $P \neq 0$, then [PNS] is a (perfectly Homogenous, Isotropic and Elastic Medium, in spatial and Temporal domain) Field with infinite points which have a \pm

Charge with $P = 0 \rightarrow P = \Lambda \rightarrow \infty$ and work (W) is quantized on material points as spin $\pm (\bar{p})$ and from this equilibrium of the quantized angular momentum $\bar{\Lambda}$, independently of time, is capable of forming the wave nature of Spaces, following the Boolean logic and distorting momentum $\bar{p} = \bar{\Lambda}$, as energy, on the intrinsic orientation position of points, on all points of the microscopic and macroscopic homogeneity, and since also in common circle rotational velocity, $\bar{\omega}$, and momentum, $\bar{\Lambda}$, are constants and thus consist a Pure quaternion, so conjugation of the two is as $(\partial/\partial t, \bar{\omega}) \odot (0, \Lambda) = (-\Lambda, \omega \times \Lambda) = (-\bar{H} \times \bar{P}, \nabla \times \bar{\Lambda}) = [\lambda, \nabla \times \bar{\Lambda}]$. [13-15]. → [Erebus –Black-Night]

The work W, of the two opposite dipole \bar{AB} , \bar{BA} in the same plane is equal to $W = [n \cdot P \cdot ds] = [\lambda = \Lambda \Lambda, \Lambda \times \Lambda]$ where, λ = displacement of A to B and it is a scalar magnitude called wavelength of the new dipole \bar{AB} .

Λ = the amount of rotation on dipole \bar{AB} , (this is angular momentum \bar{L} , and it is a vector parallel to, a, axis.

Momentum $\pm \Lambda = r \cdot m \cdot v = r \cdot m \cdot \omega r = m r^2 \cdot \omega$, where, r, is the radius and angular velocity $\bar{\omega} = (\text{spin})$ which maps velocity vector \bar{v} , on the perpendicular to, a, axis plane with the two components $\bar{v} \perp \bar{v} \cdot B$. Tangential velocity $\bar{v} \cdot E = \bar{\omega} \cdot r$ is a quaternion $\bar{v} \cdot E = \bar{\omega} \cdot r = \bar{z} = [s + \bar{v} \cdot \nabla i]$ where $s = |\bar{v} \cdot E| = |\bar{r} \cdot \bar{\omega}|$ and $\bar{v} \cdot \nabla i = |\bar{\omega} \times \bar{r}| = |\bar{\omega}| \cdot |r| \perp |\bar{\omega}| \cdot r$ where the two opposite biaxial ellipsoid equilibrium and it is the How conservation it happens. [26]. → [Erebus]

9. Momentum $\bar{p} = \bar{\Lambda}$ on the infinite dipole $AiBi$ of spaces with a momentum lever equal to zero (0) or equal to wavelength, λ , create *linear motion*, while with a momentum lever $\neq 0$ creates the *rotational motion* (Euler, Coriolis, Centrifugal) → $m \cdot [(d^2 \bar{r}/dt^2) + m \cdot [d\bar{\omega}/dt \times \bar{r} + 2\bar{\omega} \times (d\bar{r}/dt) + \bar{\omega} \times (\bar{\omega} \times \bar{r})]$ where momentum $\bar{p} = m \cdot r \cdot \bar{\omega}$ and mass m is a constant equal to, *the Reaction to the motions*, or as Inertia (I) which are a natural property of dipole and both are conserved vice versa. Forces $dP = PA - PB$ parallel to the Space, Anti-Space lines $[S] \perp [AS]$, create a Static force field B, and when Forces dP are perpendicular to the Space Anti-Space lines, create a Static force field E, which experience *Lorentz force* and it is the fundamental interpretation cause of motion, in small and large scales Spaces. On all dipole of wavelength, λ , and momentum Λ , their product $\lambda \cdot \Lambda = k_{1,2,3}$ constant for each energy cave level. The fundamental force in universe is the total kinetic energy $T = 1/2 \bar{\omega} L = \Sigma(L^2/2 \cdot I)$, a repulsive force following Pythagoras conservation law such that both T, *kinetic energy*, and L, *Potential energy*, be conserved (when T decreases then this lost energy is transferred to angular momentum L and vice versa, *in L by changing angular velocity vector* $\bar{\omega}$, differently is needed a speed faster than that of light which may happen elsewhere.

Energy is conserved on three perpendicular fields J, E, B, on dipoles such that the total kinetic energy to be the diagonal of the cuboids and it is the How this conservation happens [18-19]. → [Erebus+Day]

10. Geometrical caves: Nature has not any <meter> to

measure quantized quantities (that of Space and of Energy) except these of the Geometry constants, one of which is number π (Archimedes number π) so quantization of Points (λ) follows geometry constant (π) and for Energy Wd , which is the quantized Energy of the Quantity dissipated per cycle, [and this because monads follow sinusoidal oscillation on wavelength = monads as the w .th power and the n .th root of this monad where $w.n=1$ as above on and in the same monad] and which energy is equal to, $Wd = \int \dot{x} . dx = \int C \dot{x}^2 . dt = (\pi C w) . \lambda^2 / 4 = (2\pi^2 C . \lambda^2 / 4) . f = (m\pi . \lambda^2 / 2) . f = C . f$ i.e. From above monads $(s + \bar{v} \nabla i)^{1/w} = |zo|^{-w} . e^{i . (\varphi + 2k\pi) / w}$ where $\cos\varphi = s/|zo|$, and for Rotated Energy case where $s = 0$ and also $\cos\varphi = 0$ exists for angle $\varphi = \pi/2$, the quaternion

$(s + \bar{v} \nabla i)^{1/w}$ as dimension power $w=b$ and it is as $e^{-i . (\frac{\pi}{2} + 2k\pi) . w} = e^{-i . (\frac{5\pi}{2}) . b} = e^{-i . (\frac{5\pi}{2}) . 10}$ where $L_p = e^{i . (-\frac{5\pi}{2}) . 10}$ is the basic Geometrical interpretation of < Planck scale meter > based on the two Geometry constants e, π where $k=1$, and base $b=10$, and this from logarithm properties with different bases on the same base e [when $e^y = x$ then base e logarithm of x is $\ln(x) = \log_e(x) = y$ as it is $e^w = (b^{\log(b)e})^w = b^{w . \log(b)e}$ and ${}^w\sqrt{e} = e^{1/w} = e^{-w} = \frac{1}{x^{w . \log(b)e}}$ which are

For base $e = 2,71828$ and $k = 0$ $L_v = e^{i . (\pm \pi/2)} b$ then $e^{(-15,7079)} = 1,78118 . 10^{-7} m$ Energy Balanced

For base $e = 2,71828$ and $k = 1$ $L_v = e^{i . (-3 . \pi/2)} b$ then $e^{(-47,12389)} = 5,344 . 10^{-21} m$ Energy Balanced

For base $e = 2,71828$ and $k = 2$ $L_v = e^{i . (-5 . \pi/2)} b$ then $e^{(-78,5398)} = 8,906 . 10^{-35} m$ Planck's Length

For base $e = 2,71828$ and $k = 3$ $L_v = e^{i . (-7 . \pi/2)} b$ then $e^{(-109,9956)} = 2,295 . 10^{-48} m$ Layer Length

For base $e = 2,71828$ and $k = 4$ $L_v = e^{i . (-9 . \pi/2)} b$ then $e^{(-141,372)} = 3,969 . 10^{-62} m$ Gravity Length

For base $e = 2,71828$ and $k = 5$ $L_v = e^{i . (-11 . \pi/2)} b$ then $e^{(-172,7876)} = 9,593 . 10^{-76} m$ Layer Length

For base $e = 2,71828$ and $k = 6$ $L_v = e^{i . (-13 . \pi/2)} b$ then $e^{(-204,2040)} = 7,155 . 10^{-89} m$ 1st Layer Length

For base $e = 2,71828$ and base $b=10$, then $e^{-78,5398} = 8,906 . 10^{-35} m$ and divided by $\sqrt{3} \pi = 1,616199 . 10^{-35} m$

since cave is a versor then \rightarrow

$$\text{Planck's Length } L_p = e^{i . (\frac{\pi}{2} + 2k\pi) . b} = e^{-i . (\frac{5\pi}{2}) . b} = e^{i . (-\frac{5\pi}{2}) . 10} = e^{-(78,5398)} = 8,906 . 10^{-35} m = \{\sqrt{3} . \pi 1,616199 . 10^{-35} m\}$$

Conservative Planck's constant $L\text{-Planck} = 1,616 . 10^{-35} m = \sqrt{h . G^3}$ is consisted of the three compromising constants h, G, c , instead of geometry cave $L_p = e^{i . (-5\pi/2) . 10}$, which is based on the two natural constants e, π . [29-30], \rightarrow [Black-Night]

11. The action of a quaternion on point is equivalent as - *Energy Density and Pressure*- the state of stress at a point on the deformed placement or new configuration which is on the directional axis of the point. *Gravity* exists upon the point axis as $[[d\bar{w}/dt]x \bar{r} + 2\bar{w}x(d\bar{r}/dt) + \bar{w}x(\bar{w}x\bar{r})]$ where angular velocity is $\bar{w} = |\bar{\Lambda}| / |\bar{r}| = k/(\lambda m)$ and so exerts a direct action between two events, i.e. *Stationary points of [PNS] are rotating dipole and may be pictured as wave existing in the infinite points of Spaces and exerting an action (pressure) on the moving Spaces, dipoles.*

monads in monads and is of Wave motion with angular velocity $w = 4.Wd/(\pi.C.\lambda^2)$, i.e. Space and Energy is quantized and measured on the two Constant and Natural numbers e, π . where for base the natural logarithm, e , and exponent the decimal base, $b = 10$, then issues \rightarrow During Diffraction, $d\bar{s}$, frequency, f , doesn't change and only the velocity, \bar{v} , and wavelength, λ , changes and the Total Energy is $[z^{1/w} = |\bar{z}|^{-w} . Lo]$. Again because $\rightarrow z^{1/w} = (s + \bar{v} \nabla i)^{1/w} = |zo|^{-w} . [\cos . (\varphi + k\pi) / w + i . \sin . (\varphi + k\pi) / w] = |zo|^{-w} . e^{i . (\varphi + k\pi) / w}$, and then,

For $\cos . (\varphi + k\pi) / w = 0$ then exists only the Imaginary part of monad, $(\bar{v} \nabla i) \neq 0$, where $\varphi = \pi/2$ and then $z^{1/w} = |zo|^{-w} . e^{i . (\varphi + k\pi) / w} = \pm i . (\pi/2 + k\pi) . 10$ and it is the Diffraction Energy mechanism for all Space Levels of quantization which are Energy Particles only i.e. Energy particles are then where issues $z^{1/w} = |zo|^{-w} . L_v = \rightarrow$ Energy Monads.

For $\sin . (\varphi + k\pi) / w = 0$ then exists only the Real part of monad, $s \neq 0$, where $\varphi = -\pi \pm k . \pi$ and then spaces

$z^{1/w} = |zo|^{-w} . e^{i . (\varphi + k\pi) / w} = \pm i . (-\pi \pm k\pi) . 10$ and it is the Diffraction Massive mechanism for all Space Levels of quantization which are particles with mass, the reaction to the motion, only.

$$\text{Extending } L_v = e^{i . (\frac{\pi}{2} + 2k\pi) . b} = e^{i . (\frac{\pi}{2} + 2k\pi) . 10} \text{ then,}$$

The Stability is achieved by the Anti-space and it is the How happens the interaction and equilibrium in spaces. [39]. \rightarrow [Erebus + Aether]

12. In Black hole Energy scale ($\lambda . \Lambda = k 1$) there are infinite high frequency small amplitude vacuum fluctuations at Planck energy density of $10^{113} J/m^3$ that exert action (pressure) on the moving Spaces dipole and their Stability is achieved by Anti-space also. A wide analysis for gravity force and gravity medium is shown in Maxwell's Displacement field [39-40-41]. \rightarrow [Black-Night + Aether + Day]
13. The force between two charges $(+q) - (-q)$ of distance, s , create an Electric field $(-E), (+E)$ of Potential $U = q.E$. The force between the two charges is a) Attractive or b) Repulsive, when both are Sources or Sinks and particles repel for equal

charges, $E=k.(2q/s^2)$. For non-uniform fields the force on the two equal but of opposite point charges do not cancel field. The dipole will rotate to align with the field, hence there must be a torque [Torque = $\bar{q} \times E$] on the dipole as well.

14. Dipole vectors are quaternion's (versors) of waving nature, i.e., one wavelength in circumference in energy levels, that conserve energy by transferring Total kinetic energy T into angular momentum $L = \bar{r}m\bar{v} = \bar{r}p = \bar{r}\Lambda$, where mass m is a Constant.
15. Different versors with different Energy (scalar) possess the same angular momentum. A Composition of Scalar Fields (s) and Vector Fields (\bar{v}) of a frame, to a new unit which maps the alterations of Unit by rotation only and transforms scalar magnitudes (particle properties) to vectors (*wave properties*) and vice-versa, and so, has all particle-like properties of waves and particles. In Planck Scale, when the electron is being accelerated by gravity which exists in all energy levels as above, the gravity is still exerting its force. Matter is built out only from the primary dipole $AiBi$.

In a spherical cave the Biaxial Ellipsoid ($\sigma x = \sigma y$) exists as momentum + Λ on caves of diameter $2r$ with parallel circles $\rightarrow 0$. The Biaxial Anti-Ellipsoid ($-\sigma x = -\sigma y$) exists as equal and opposite momentum - Λ on the same diameter $2r$ with anti - parallel circles $2r \rightarrow 0$. 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 and, recover equilibrium, which is the center of the spherical cave. The Biaxial Ellipsoid and Anti-Ellipsoid are inversely directed and rotated in the same circle, so the two opposite velocity vectors collide. This collision of the two opposite velocity vectors is the Action (Thrust) of the two quaternion and since this is as, Action of quaternion's

$(s + \bar{v}.\bar{V}i)(\bar{s} + \bar{v}.\bar{V}i) = [s + \bar{v}.\bar{V}i]^2 = s^2 + |\bar{v}|^2.\bar{V}i^2 + 2[s \times \bar{v}.\bar{V}i] = s^2 - |\bar{v}|^2 + 2[s \times \bar{v}.\bar{r}].\bar{V}i = s^2 - |\bar{v}|^2 + [2\bar{w}].|s| |\bar{r}].\bar{V}i \dots (3-a)$ where, $[+s^2] \rightarrow s^2 = (w.r)^2$, is the real part of a new quaternion which is, the positive Scalar product, of Space from the same scalar product, $s.s$, with $1/2, 3/2$, spin, and represents the, Space, part of quaternion, the minimum Space - Quanta.

$[-s^2] \rightarrow -|\bar{v}|^2 = |\bar{w}.\bar{r}|^2 = -[|\bar{w}|.|\bar{r}|]^2 = -(w.r)^2 \rightarrow$ is the always, the negative Scalar product, of Anti-space from the dot product of \bar{w}, \bar{r} vectors, with $-1/2, -3/2$, spin, and represents the, Anti-Space, part of quaternion, the minimum Anti - Space Quanta.. \rightarrow [Day in Erebus]. [35]

$[\bar{V}i] \rightarrow 2.|s| \times |\bar{w}.\bar{r}].\bar{V}i = 2|w.r|.|\bar{V}i = 2.(w.r)^2 \rightarrow$ is a vector of, the velocity vector product, from the cross product of \bar{w}, \bar{r} vectors with double angular velocity term and represents the, Velocity vector product, of quaternion giving 1,3,5, spin, the minimum Energy-Quanta.(this is the How Particles are originated). The Geometrical formulation is \rightarrow

Thrust $[\bar{c}.\bar{V}i]$ acting on, Energy and Space Fragments, $\{(\bar{V}i), (+s^2), (-s^2), (+cs^2), (-cs^2)\}$ where $[(\bar{V}i) \rightarrow (+s^2) \leftrightarrow (-s^2)] =$ The dipole Gravity-field-energy] and $[(\bar{V}i) \rightarrow$

$(+cs^2) \leftrightarrow (-cs^2)] =$ The dipole Gravity-Dark-matter-energy] carry them in the three dimensional parallel space, with the light velocity, \bar{c} , as the Rest Gravity-field-Energy, and the rolling Movable Heap on it, the Dark - matter - energy}. This is the Expanding universe without Big-Bang.

4.1. The [STPL] Mechanism , Fig. 3

1. [STPL] is a *Geometrical Mechanism* that produces and composite all opposite space Points from Spaces (A-B-C), Anti-Spaces (AE,BE,CE) and Sub-Spaces (KAKBKC) in a Common Circle, *Sub-Space*, line or cylinder.
2. Points A,B,C and lines AB,AC,BC of *Space*, communicate with the corresponding AE,BE,CE and AE, BE, CE, of *Anti-Space*, separately or together with bands of three lines at points PA,PB,PC, and with bands of four lines at points DA,DB,DC on common circumscribed circle (O,OA) the *Sub-Space*.
3. If any monad AB (*quaternion*), $[s, \bar{v}.\bar{V}i]$, all or parts of it, somewhere exists at points A,B,C or at segments AB,AC,BC then [STPL] line or lines, is the Geometrical expression of the Action of External triangle KAKBKC, the tangents as extrema is the *Subspace*, on the two Extreme triangles ABC and AE, BE, CE (of *Space Anti-space*). of 1,3,5, spin, the minimum Energy - Quanta.(this is the How Opposites combine to produce the Neutral). [Born] and, In the recovery equilibrium (a surface of a cylinder with $2r$ diameter), and because velocity vector is on the circumference, the infinite breakages identify with points A,B,C (of the extreme triangles ABC of Space ABC) and with points AE, BE, CE (of the extreme triangles AE, BE, CE of Anti-Space) all, on the same circumference of the prior formulation and are rotated with the same angular velocity vector \bar{w} . The inversely directionally rotated Energy $\pm \bar{\Lambda}$ equilibrium into the common circle, so Spaces and Anti-Spaces meet in this circle which is the common Sub-space. Extreme Spaces (the Extreme triangles ABC) meet Anti-Spaces (the Extreme triangles AE, BE, CE), through the only Gateway which is the Plane Geometrical Formulation Mechanism (mould) of the [STPL] line, or as cylinder.[17]

The \rightarrow [Space, Anti- Space equilibrium, $\pm \bar{\Lambda}$, Absolute System [S] \leftarrow], as Angular momentum $\bar{\Lambda} = \Omega = m.v.r$, is Crushed out into Fragments and, becoming the three Breakages $[s^2 = (wr)^2]$, $[-s^2 = -(wr)^2]$, $[\bar{V}i = 2(wr)^2]$, and after clashed with the velocity vector \bar{v} of [S], (unless succeed to escape unclashed through centre O in STPL line and this because $\bar{v} = 0$), are Thrown OFF this System [S], conveyed into the Linear momentum, the Inertial and Energy-Space, the Relative [STPL] System [R] as Particles Fermions $\rightarrow [\pm \bar{v}.s^2]$ and Bosons $\rightarrow [\bar{v}.\bar{V}i]$. [27] \rightarrow [Black-Night, Born].

When the three Breakages succeed to escape unclashed through center O, then consist the Rest Gravity-field and force, and when clashed with the constant velocity, c , then consist the Expanding with, light velocity c , the Rest Gravity -field and the continually parallel Moving Dark-matter-energy Heap.

Work: The work, W , of the Gravity is effecting on (-) Field-Medium only for the equilibrium of spaces. Electromagnetic waves are created by the vibration of an electric charge. This vibration creates a wave which has both an Electric and a Magnetic perpendicular component. (this is the How Work as Energy, travels). [41]

Work as Energy is Quantized, converted, in Space monads, caves, cells, $\bar{x} = d\bar{s} = \lambda m$, as pressure σ, τ , the pressure is converted as velocity in caves and a Standing Electromagnetic Wave E, P which consists the Standing monad (Displacement current) and the moving Energy monad (by altering the inner wavelength or Period of monad) in Gravity's field medium [MFMF] and is dissipated as Quaternion monads (Particles or Waves, matter or vectors) as Forces (displacements, masses, pressure etc.) using modulus, coefficients, reactions to the motion and all other geometrical indices. Stability In-Out wavelength is obtained by the Isochronous Anti-Standing Electromagnetic Wave E, P which happens on Anti-cycloid, Evolute, and whirling, Curl, by the equality of the two transverse Complex Envelope displacements, Amplitudes, that consist the Standing monad (Displacement current in monads). [40] → [Aether]

In [33-35], Un-clashed Fragments through center O , consist the Medium-Field Material-Fragment → $[\pm s^2] = [\text{MFMF}]$ as base for all motions, and Gravity as force $[\nabla i]$, while the clashed with the constant velocity, \bar{c} , consist the

Dark matter $[\pm \bar{c}.s]$ and the Dark energy $[\bar{c}. \nabla i]$, or from → Breakages $[\pm s^2 = \pm (w.r)^2]$ and $[\nabla i = 2(w.r)^2]$ then become,

1. $[\pm \bar{v}.s^2] \rightarrow$ Fermions and $[\bar{v}. \nabla i] \rightarrow$ Bosons
2. $[\pm s^2] \rightarrow [\text{MFMF}]$ Field, and into their dipole Field, $[\nabla i] \rightarrow$ Gravity force
3. $[\pm \bar{c}.s^2] \rightarrow$ Dark matter, and into their dipole Field

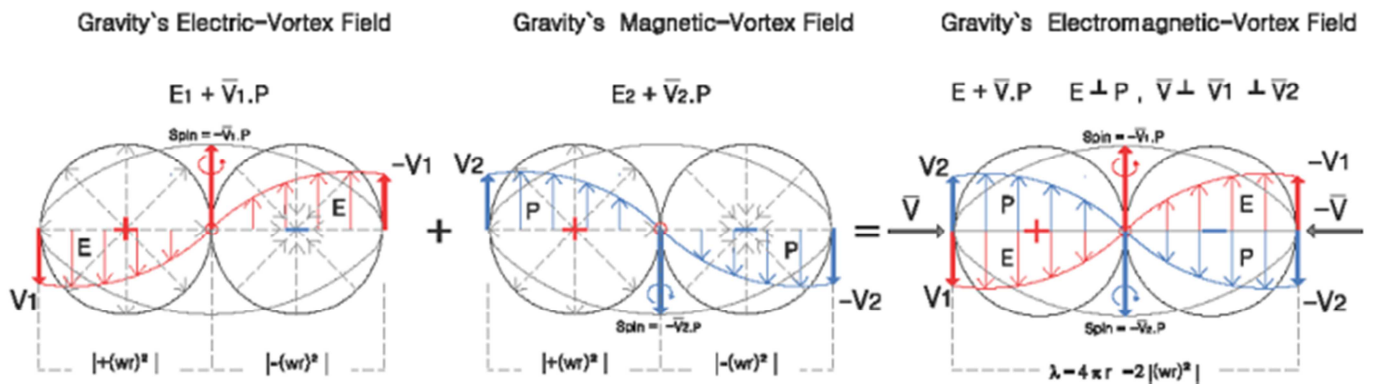


Figure 8. Fragments $[(+|w.r|^2) \leftrightarrow (-|w.r|^2)]$ as Dipole are joined by Gravity Force that causes the Electromagnetic Gravity - Field → a forced welded spinning dipole.

It was referred that Fragments $s^2 = \pm |(\bar{w}.r)^2|$ occupying the minimum quantized space $|s^2|$ are deported and fill all [STPL] cylinder which is the Rest Quantized Field $\pm [(\bar{w}.r)^2]$ or it is, the material point in mechanics, as the base of all motions where force $[(\bar{w}.r)^2 \nabla i] = 2.[(\bar{w}.r)^2]$ is vibrating on length $2.[(\bar{w}.r)^2] = \lambda$ as a Stationary Wave, and creates the curl

Electromagnetic Field $E \perp P$, on which is the Universal Quantized force called Gravity. The Gravity - Force is equal to, $F_g = q.[E + \bar{v} \times P]$ and is exerted on any movable particle

Gravity force, $[\bar{c}. \nabla i] \rightarrow$ Dark energy is Thrust.

All particles are characterized by their quantized cave the minimum Space $[V = \frac{4\lambda^3}{3\pi} = \frac{4(w^2r^2)^3}{3\pi}]$ composed of an inner Electromagnetic wave constituent $[E \perp H], h = 2\pi/\lambda$, the reaction to these velocity motions is the mass $[m = (pr).w/c^2 = \frac{h.w}{2\pi.c^2}]$, the external energy momentum $p = \frac{h}{2\pi\lambda}$ and Spin (the helically rotating electric field vector corresponding to a circularly polarized Electromagnetic wave propagating with attenuation to velocity's direction). Conservation laws of energy linear and angular momentum are satisfied by the inner Anti-cycloidal motion, (on the evolute curve). This interpretation when applied to < Young's interference and Polarizer experiments > is shown the unified understanding between the classical Electromagnetic field and the quantum particle. (this is the How Particles are originated and the How their nature is). → [Day]

4.2. Gravity - Field, Gravity - Force.

It was referred that Thrust $[\bar{c}. \nabla i]$ is acting on the five Energy-Space Fragments $\{(\nabla i), (+s^2), (-s^2), (+cs^2), (-cs^2)\}$ and on the two Dipole-Couples, where for Couple $[(\nabla i) \rightarrow (+s^2) \leftrightarrow (-s^2)] =$ Is the dipole Gravity-field-energy, and for the Couple $[(\nabla i) \rightarrow (+cs^2) \leftrightarrow (-cs^2)] =$ Is the Gravity dipole Dark-matter-energy, i.e. The same force for the two Couples.

The two, opposite signed, Fragments $s^2 = \pm |(\bar{w}.r)^2|$ consist the under Gravity primary Dipole, $[|+s^2| \leftrightarrow |-s^2|] = |\lambda| \equiv [|+(\bar{w}.r)^2| \leftrightarrow |-(\bar{w}.r)^2|]$ where on this, Force $[\nabla i = 2.s^2 = 2(w.r)^2]$ as velocity $\bar{v} = \bar{c}$, The Thrust, causes the Gravity's Electromagnetic Field $E \perp P$ as $\rightarrow [\nabla i].(+s^2), [\nabla i].(-s^2), [\nabla i].(|\pm s^2|) = [\nabla i].[|+s^2| \leftrightarrow |-s^2|]$, [40-41], Fig. 6.

with charge \bar{q} .

Gravity - Field is $G_f = [E + \bar{v} \times P]$, the unmovable, forced welded spinning dipole, and because jointed with force, means that Newton's laws issue in both, Absolute System [S] and Relative System [R].

On cycloid, Thrust $\rightarrow g =$ Force $F =$ velocity, where Velocity $\bar{v} = [\sqrt{g/4r}], p = [\sqrt{g/4r}].|(1)-(2)|$.

Acceleration $\bar{a} = (d^2s/dt^2) = -(g/4r).s$

Trajectory acceleration $\bar{a}_q = g.\sin\phi = [g/4r].s$

Centripetal acceleration $\bar{a}_r = (v^2/\rho) = [g/4r].\rho = [g/4r].AA'$, where point A' is on anti-cycloid.

Ratio $v/\cos\phi = \sqrt{4gr}$ = constant and velocity of center K of rolling circle is, $\bar{v}_K = v.r/PA = (1/2).v/\cos\phi = \sqrt{gr} \rightarrow$ i.e.

The motion, the velocity, of the rolling circle center is linear.

Force $2[(\bar{w}.r)^2]$ as velocity \bar{v} is acting at point (1) and since $dF=0$ then is analyzed into the two equal velocity vectors

$\bar{v}_x = \bar{v}_1 = (\bar{w}.r)^2\sqrt{2}$, $\bar{v}_y = \bar{v}_2 = (\bar{w}.r)^2\sqrt{2}$ as the cross-product

$\bar{v} = \bar{v}_1 \times \bar{v}_2$ i.e. in two perpendicular plane motions.

Energy as the horizontal constant velocity \bar{v}_1 = (thrust), is transported at point (2) by following the tangential trajectory at A , forming on cycloid the Electric field, E , and for stability the anti-trajectory A' on Evolute, the Anti-Electric field $-E$, both decomposed in a velocity \bar{v}_1 perpendicular to the trajectory and thus executing zero work, and v_1 tangential to the trajectory executing the work. The equation of Gravity's Standing waves E, P is from Wave function,

$Y = [2A \sin kx] \cdot \cos wt = [2A \sin(\frac{2\pi}{\lambda}) \cdot x] \cdot \cos 2\pi(\frac{t}{T})$, where $A = v_1 = v_2 = |v|/\sqrt{2} \rightarrow$ Wave's Amplitude, $kx = \pi/2, \pi, 3\pi/2, 2\pi \rightarrow$

The Wave's number, location, $w = 2\pi f = 2\pi/T \rightarrow$ Oscillating frequency, angular frequency then and equations become,

$$E = 2A \cdot \sin kx \cdot \cos wt = \sqrt{2} \cdot |(wr)^2| \cdot \sin kx \cdot \cos wt$$

$P = 2A \cdot \sin kx \cdot \cos wt = \sqrt{2} \cdot |(wr)^2| \cdot \sin kx \cdot \cos wt \rightarrow$ which consist the Gravity's Electromagnetic wave equations, The energy of a particle which is the intrinsic stored work, is the Energy flow $Sp = ExH$ along the direction of motion. Particles have either rest or motional mass or both. From Lagrange's equations of the first kind, $2E = mv^2 = (mv).v = p.v = p.(wr) = (pr).w = (pr).[2\pi/T] = 2\pi(pr).[c/\lambda] = hc/\lambda$ since $\lambda = cT$, and $2\pi(pr) = h =$ Planck's constant i.e. \rightarrow mass $m = (pr).w/v^2 =$ the meter of reaction to the motion \leftarrow and \rightarrow momentum $p = 2\pi(pr).[c/\lambda]$ the Anti-reaction \leftarrow and for $v = c =$ velocity of light, then Planck's energy equations for \rightarrow mass $m = (pr).w/c^2 = \frac{h.w}{2\pi.c^2}$ and momentum $p = \frac{h}{2\pi\lambda}$ where, $w =$ Particle's oscillation frequency which is that of inner common circle and it is constant, and, r , the rolling circle's radius. All waves oscillate with energy $2E = p.v = [pr].w$, which awareness translational motion (pr) at light, c and rotational at spin(w) motion in helical behavior. The Work Quantization process occurs as this compound helical motion and is conserved in $<$ wavelength of particles (monads) following all known physical laws. Plane wave's Energy is stored as Stationary wave's Energy in case (knot points) of wave Interference.

The equal phase, Plane Wave equations are,

$$A_{x,t} = A_o \cdot \cos(kx - wt + \phi) \text{ where } k = 2\pi/\lambda, w = 2\pi/T = 2\pi f, \phi = kx, c = \lambda/T = \lambda.f = w/k$$

$$E_{x,t} = E_o \cdot \cos(kx - wt) \text{ Electromagnetic waves, } H_{x,t} = H_o \cdot \cos(kx - wt)$$

$$S = [\bar{E} \times \bar{H}]/\mu = [|\bar{E}| |\bar{H}|] \cdot [S_o/\mu] \cdot \cos^2(kx - wt) \text{ Energy density with translational outer velocity } \bar{v}(t) = p/m = \bar{\Lambda}/m.$$

The equal phase, Stationary Wave equations are,

$$E = 2A \cdot \sin kx \cdot \cos wt = 2A \cdot \sin(\frac{2\pi}{\lambda}) \cdot \cos wt \quad P = 2A \cdot \sin kx \cdot \cos wt = 2A \cdot \sin(\frac{2\pi}{\lambda}) \cdot \cos wt \text{ where}$$

a. $A = v_1 = v_2 = |v|/\sqrt{2}$, $kx = \pi/2, \pi, 3\pi/2, 2\pi$, $w = 2\pi f = 2\pi/T$ with inner velocity $v(i) = \lambda/T = \lambda.f = w.r$ and phase velocity $\bar{v}(r) = w/k = w\lambda/2\pi$. [41]

b. The pressure Amplitude $P_d = \rho.c.w.A_o = \rho.c.w.[\epsilon E^2 + \mu H^2]/2$ and Intensity of Dark-Fringes $I_d = \frac{\rho\pi^2 c^3}{2\lambda^2} \cdot [\epsilon E^2 + \mu H^2]$

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

d. Energy $I_d = (\frac{\rho.c}{2}).(wA_o)^2$ in Interference pattern \rightarrow then appearance is as Wave

e. The field Intensity estimation $S = h.f$ is,

$$S = [\bar{E} \times \bar{H}] = [\frac{\epsilon.E^2 + \mu.H^2}{2}].[\frac{4}{3}\pi\lambda.(\frac{\lambda}{\pi})^2] = h.f \text{ and energy}$$

$$E = H$$

$$\text{so, } E = H = \sqrt{\frac{3h}{\pi.c(\epsilon + \mu)}} \cdot [\frac{w^2}{2\pi c}]$$

4.3. Dark Matter – Dark Energy. The Dipole Dark-Matter-Energy. Fig. 7

Dark-matter becoming from the center, O , of common circle where there, $v = 0$, and it is $(\pm c.s^2)$ moves with the constant light velocity, \bar{c} , and is composed of the two opposite signed elements, $(+cs^2), (-cs^2)$, and Dark-energy $[\bar{c}.\nabla i]$ moves also with the same velocity of light, so is continually effecting on the two fragments separately and on their dipole jointed by the Gravity Thrust (∇i) as $[(\nabla i) \rightarrow (+cs^2) \leftrightarrow (-cs^2) \text{ is the Gravity Dark-matter-energy}]$ and slinging them further, formulating the attracting, the mixture of the spherical opposite signed elements which highlights, while dipole form the heavy and massive invisible dark matter which repel, the dipole energy blobby volumes as the massive Dark -Fringes. The parallel motion of this mixture, not parallel universes, is the rolling on Gravity field as Base of expanding.

The Continuous [The light Moved mixture DM-DE is Geometrically Rolling] Expansion for the constructing universe \rightarrow

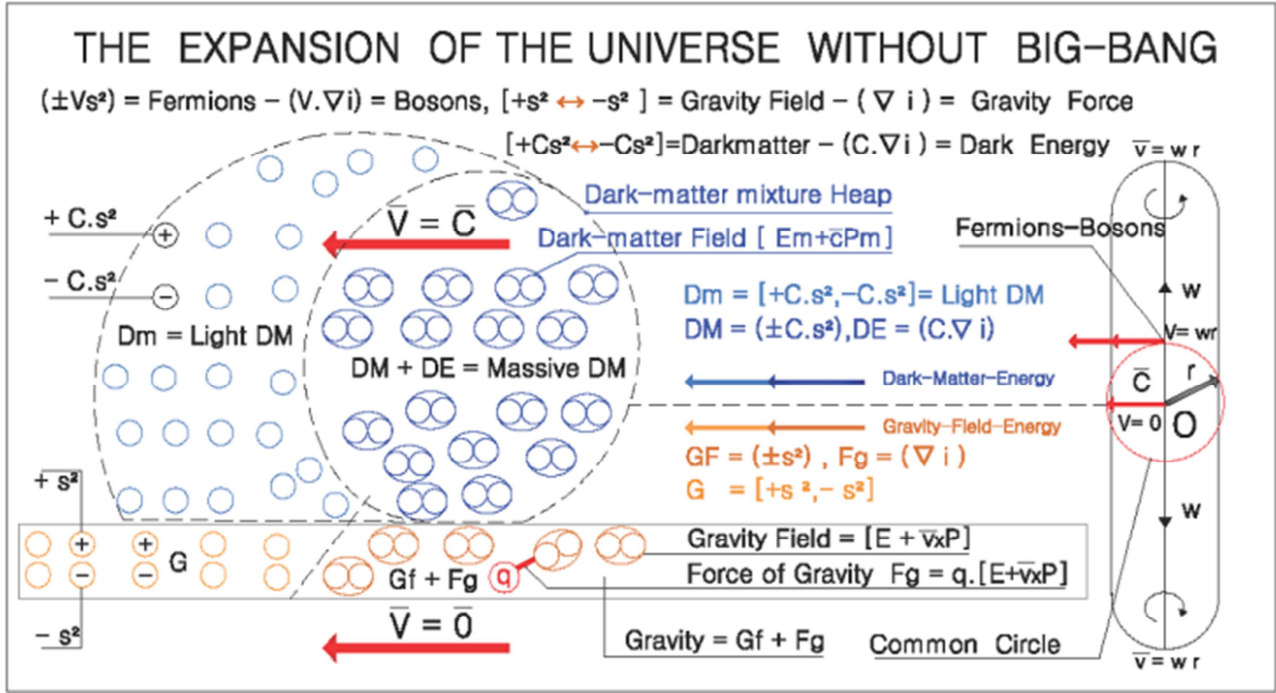


Figure 9 . The Cause Expansion of the Universe, is the continuous and simultaneous effection of Dark-energy $DE = [\bar{c} \cdot \bar{V}i]$ on all Five Fragments with light velocity, \bar{c} , as, $[\bar{c} \cdot \bar{V}i] \rightarrow \{ (\bar{V}i), (+s^2), (-s^2), (+cs^2), (-cs^2) \}$ which is the rolling Heap. Energy Quantities $\bar{V}i = 2(wr)^2$ in the rolling Heap, acting on dipole breakages $[\pm s^2]$ formulate the Gravity-Field and Gravity-force while acting on dipole breakages $[\pm cs^2]$ formulate Dark matter and Dark Energy respectively, while DE acting on Leptons and Quarks, Anti-Leptons and Anti-Quarks, Bosons, formulate Material worlds.

The three properties of Dark-matter $[DM] \rightarrow [(+c.s^2), (-c.s^2), (\pm c.s^2)]$ and Dark-energy $[DE] \rightarrow [\bar{c} \cdot \bar{V}i]$:

Since $[DM] = \pm c.s^2$, is of opposite signed (\pm), then consists the Dipole, $[+c.s^2 \leftrightarrow -c.s^2] = |\lambda| = [c \cdot (\bar{w} \cdot r)^2 \leftrightarrow -c \cdot (\bar{w} \cdot r)^2]$ of Dark matter which is a more massive base than that of gravity, and this because of c , so issues DM field = $[E_m + \bar{c} \cdot P_m] = [c \cdot E_g + \bar{c}^2 \cdot P_g]$ and as this is also a Stationary field then follows equation $E_m = 2.A.c \cdot \sin(\frac{2\pi}{\lambda}) \cdot \cos wt$ where $P_m \perp E_m$.

Gravity Thrust ($\bar{V}i$) acting on $(\pm s^2)$ dipole $[(\bar{V}i) \rightarrow (+s^2) \leftrightarrow (-s^2)]$ creates the Rest Gravity -Field -Force, while Thrust ($\bar{V}i$) acting on $(\pm cs^2)$ dipole $[(\bar{V}i) \rightarrow (+cs^2) \leftrightarrow (-cs^2)]$ creates the Gravity Dark-matter-Energy-field.

Since also the tiny volume of $|\lambda| = [c.s^2 \leftrightarrow -c.s^2]$, consists a, sink, then DM attracts and it is an infinite ocean in all universe. Since also dark energy is effecting then, $DE = q \cdot [E_m + \bar{c} \cdot P_m]$ align with the field, so on DM dipole $[E_m + \bar{c} \cdot P_m]$ exist also a torque (τ) and in this way DE repels.

Dark-energy $[\bar{c} \cdot \bar{V}i]$ acting on the three constituents of $DM = [(+c.s^2), (-c.s^2), (\pm c.s^2)] = [s^2 \leftrightarrow -s^2]$ separately and being also a non- uniform field, then is not canceled but is a pushing force. As space expands, energy is not diluted because heap is also travelling with the same constant light velocity, c , and so universe is normally expanding. Since Dark -matter is a heavy and massive material, then is opposite to all kinds of matter and this heavy matter bend light passing near from objects further away i.e. DE is influencing in expanding of the Discrete universe. Because DE is a stationary force on DM, so is exerting a strong gravitational pull on gravity field (participates in gravity).

Action of $[DE] \odot [DM] \equiv [\bar{c} \cdot \bar{V}i] \odot [DM] \rightarrow [\bar{c} \cdot \bar{V}i] \cdot (+c.s^2), [\bar{c} \cdot \bar{V}i] \cdot (-c.s^2), [\bar{c} \cdot \bar{V}i] \cdot (\pm c.s^2) = [\bar{c} \cdot \bar{V}i] \cdot [c.s^2 \leftrightarrow -c.s^2]$, Results to \rightarrow

1. $DM \rightarrow [c.s^2 \leftrightarrow -c.s^2] = \bar{c} \cdot [s^2 \leftrightarrow -s^2]$ attracts but how and why, and $DE \rightarrow [\bar{c} \cdot \bar{V}i] = \bar{c} \cdot \bar{V}i$ repels and not competing
2. DE is exerting a pull and a gravitational pull on all visible matter on the largest cosmic scale of the universe and this because, being in the Heap, is travelling with the light velocity.
3. DE by exerting pull on $DM \rightarrow [\bar{c} \cdot \bar{V}i] \cdot (+c.s^2)$ and on $[\bar{c} \cdot \bar{V}i] \cdot (-c.s^2)$ highlights, and on $\rightarrow \bar{c} \cdot \bar{V}i \cdot [c.s^2 \leftrightarrow -c.s^2]$ the Darkness which is the tiny energy volume consisting the dipole of dark matter, and formulates the massive Dark Fringes jointed by gravity force $[\bar{V}i]$ and this because are not particles. [41]
4. DM and DE are not visible because both travel with light velocity and so light is not interacting with them. Light, which is a particle, is interacting with the Rest Gravity field and all others with less velocity and so are detectable. Only velocities greater than that of light, or a new simultaneity mechanism, can make them visible. When Anti-matter annihilates with matter, gamma rays are produced because in Energy-space continuum remains only the energy while DE acting on DM fragments $[c.s^2], [-c.s^2]$ formulates the massive compact spherical objects and the massive compact anti-spherical Anti-objects.
5. Because of the DM and DE structure, which is breakages and force, collision of galaxies does not predict stars to be smashed into others. As above are

created the, gas clouds, which are smashed into the other and get heated and so be a visible effect.

6. Because light is a particle with velocity, c , interacts with the REST gravity field by the Gravity force while DM,DE having the same velocity have a parallel motion, not parallel universes, which cannot see it. DE has exactly the same effect as that of a very small constant vacuum energy MFMF field. Energy density of the Rest base MFMF is that of gravity, I_g , while of the Moving DE,DM is that of, $c.I_g$, so in this way occurs expansion of the universe. GR being confined in Planck's length L_p , could not see the whole Energy-space beyond this length, the empty space, and the way and the how could expansion occurs. Cosmological constant is the value of the energy density of the vacuum in the tiny space, without describing the how this tiny volume is expanded, so why to presume this as constant ?. The answer is that this was then introduced just to surpass the problem. [41]
7. Because DM, DE consist a not homogeneous heap of mass and energy distribution (anomalous mass) and permeate in the whole universe, is causing what is said, the expansion of the universe to accelerate without any Big-Bang explanation and of any other mysteries forces. The motion of this DM,DE, mixture of the spherical opposite signed materials and dipole energy blobby volumes, is not in contrary to gravity, F_g , because both have already passed from the center of STPL contracted mechanism and Both Dipole are jointed by the same force, the Gravity (V_i) forming the Electromagnetic Gravity field which is the Rest base of all universe and which doesn't exist apriori, but it is the Base, and this because of the zero velocity, on which the moving Electromagnetic Gravity Dark-Matter-Field the DE- DM heap mixture, with the same velocity, c , is rolling, expanding, with the maximum constant velocity, c , and is continually formulating the, Zero \rightarrow Discrete \rightarrow Infinite Geometrical Universe.
8. Black holes are gravitational wells, caves, in EREBUS so any next constituent is dissipated or collapsed, swallowed. Following above analysis it is a kind of mechanism which is source of energy and because of conservation of energy law, Black-holes, the quasars, exist in the centers of galaxies and are the beacons for astronomers and consist the recycled Space machines of the universe. DE,DM being also constituents are also recycled in Black-holes. The why are embedded in DM is a problem of stability and conservation of space and energy. Black-hole growth is connected with their existence in the center of every Galaxy, and the returning through STPL entrance, the pole entrance, to energy cave, Black-Night.
9. The principle of Virtual Work is the energy method for static procedure of interconnected Systems of material points or bodies of higher DOF and associated with the equilibrium of them and may be stated as follows < If a system in equilibrium under the action of a set of forces

is given a virtual displacement, the virtual work done by the forces will be zero, and the opposite The virtual work done by the forces is zero for any equilibrium system under the action of a set of forces $>$. In case of two material points the static procedure is, the Virtual work done by two forces is zero for a dual equilibrium system which results to the equality of opposite signed forces.

Dark Matter travelling with Light velocity is not visible unless another light with velocity faster than that of light exists. Velocity $v = \infty$ exists only in [PNS].

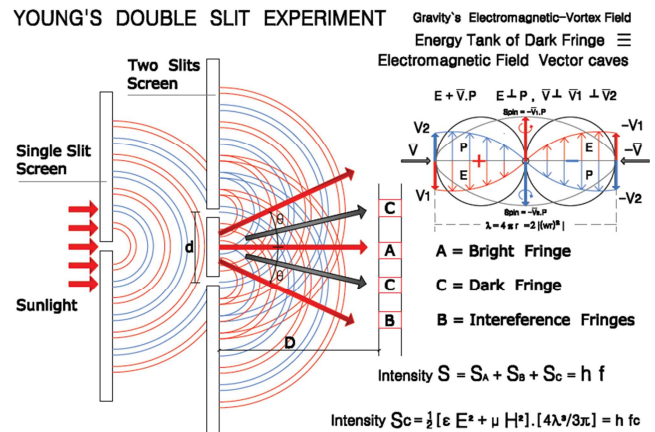


Figure 10 . The destructive Interference creates Dark fringes, C, which conserve energy in wavelength's Electromagnetic field $E \perp P$.

5. Epilogue

5.1. The Geometrically New Creation Hypothesis is Summarized as Follows

- a. From Nothing (i.e. the Point) to Existence (i.e. to be another Spherical Point) issues the zero Virtual work law, which zero Work is the equilibrium of two equal and opposite forces on points. Thus Space is the Point and Anti- space is the Other Point. Infinite points are between, the Point and Other Point, and between the Infinite points also which consist the Primary Neutral Space, infinite and discrete.
- b. Work as, motion of opposite forces, exist on the infinite points between, the Point, and, the Other Point, which Opposite forces with different lever-arms exert the equal and opposite Momentums which equilibrium in a rest and of opposite motion system, the Work done in System is zero.
- c. Opposite Momentums are only in the Rest curl Energy volumes differently would not be rest. This inverse vertical motion results to velocity vectors collision which are so crushed into fragments, and after clashed with the velocity vectors \vec{v}, \vec{c} are thrown OFF, the curl Ellipsoid energy volume (the Absolute System), and through an Anti-diffused geometrical mechanism, again in a new energy volume (the Relative System are the parallel Inertial systems). Black holes, exist on the inverse vortical motion in poles where missing mass is

recycled through this tiny volumes.

- d. This Anti-diffused mechanism drives all clashed fragments either through the, Centre of Common circle curl Ellipsoid forming the continuously created Rest Gravity Field-energy and the Movable Dark Matter-energy, or through the Tangents on Circumference of Common circle curl Ellipsoid and forming the Movable Particles–Antiparticles–Bosons, all, to an Simultaneity Relative cylindrical volume.
- e. In this cylindrical volume, which are the parallel inertial systems, exists the Rest and discrete Electromagnetic Gravity Field as the Base carpet, for the Movable and discrete Electromagnetic Gravity Field of Dark Matter and for all Formation in Rest or Movable, by Pulling and Repelling and also all moving Particles–Antiparticles and Bosons, on where are applied laws of Chemistry and Physics.

5.2. The Mechanical process

The principle of Virtual Work is the motion of a force, P, executed on a point A to reach point B, so A force acting on point A (which is Nothing) reaches point B (which is also Nothing), i.e. stability of the system A-B is obtained by the equal and opposite forces acting on points A, B. On the infinite points between the two infinite and opposite forces are also acting on them and resulting to a Whirling on a line perpendicular to A-B axis. Because of unbalance of Whirling, it is a common source of vibration excitation, the Rotating unbalanced, where then is represented by an angular velocity, w . The rest system of this opposite Whirling Energy, vortices, exists in the vibrating Ellipsoid volume which is a geometrical cave. This inverse vortical motion ($w, -w$), in cave results to velocity vectors collision which are crushed into fragments and after clashed with the velocity vectors are thrown OFF this, curl Ellipsoid energy volume (the Absolute System), through an Anti – diffused geometrical mechanism [the STPL] to a new energy volume (the rest Relative System).

Fragments through, The Centre (where $v=0$) of the Common circle Ellipsoid, form The Rest Gravity Field-energy and the Movable Dark Matter-energy, and through The Tangent (where $v=v$) on the Circumference of the curl Ellipsoid circle, form the Movable Particles–Antiparticles–Bosons, to an Simultaneity Relative cylindrical volume.

All movable elements are formulated, by Pulling and Repelling, i.e. all moving Particles–Antiparticles and Bosons and all their producing's on where laws of Chemistry and Physics are applied.

Thrust $[\bar{c}, \nabla i]$ with light velocity, \bar{c} , acting on the five Energy and Space Fragments $\rightarrow \{(\nabla i), (+s^2), (-s^2), (+cs^2), (-cs^2)\}$ and on Particles, Antiparticles and Bosons, where it is $[(\nabla i) \rightarrow (+s^2) \leftrightarrow (-s^2)] = \text{The Energy-dipole Gravity-field}$ and $[(\nabla i) \rightarrow (+cs^2) \leftrightarrow (-cs^2)] = \text{The Energy-dipole Gravity-Dark-matter- field}$], And carry them in the three dimensional parallel space with the light velocity, \bar{c} , as the Rest Gravity–field–Energy, and the rolling Movable Heap on it, the Dark–matter–energy}. This is the Expanding universe without Big-

Bang becoming only from Virtual Work Principle.

5.3. The Philosophical Setting

- [A] All comments and critique on article [some-physics].
- [B] The, chaos = Point, the, it is = Anti-point, and, what is done = The Energy consistence in Monads.
Explanatory – interpretation
1. CHAOS is that extremely Big and small magnitude with finite or infinite directions, and simultaneously to be nothing and without Position, *the Non-existence*. This exists only in Euclidean geometry, on Points only, and is the only model for Universe.
2. POSITIVE INFINITE ($+\infty$): It is the Inexperienced Space of the Universe with any Expanding Position (Direction $>$) and Unlimited dimension, with no Form of Matter inside Chaos.
3. NEGATIVE INFINITE ($-\infty$): It is the Inexperienced Space of the Universe with any Shrinking Position (Direction $<$) and Unlimited dimension, with no Form of Matter inside Chaos.
4. INFINITE: Innumerable, without Beginning and Finally, without Size and Volume either this is Small or Big.
5. MATTER: It is the Substance from which it is constituted a Thing or a Volume and in generality the substance of Units (it is a relative measure for motion changes).
6. BODY: It is the each one, Material Object.
7. SUBSTANCE: It is also the main Component of a Material or not Body.
8. OBJECT: It is Anything that becomes perceptible with the five senses or and with other means.
9. QUALITY: It is the Inner Nature of things (Body, Unit or monad)
10. QUANTITY: Is Each what it can be Measured (the numerical value).
11. BE BORN: Everything coming from something else, the mechanism.
12. EVOLUTION: The Step by step differentiation inside the same Quality.
13. TIME: Time in Euclidean geometry is not distinguished, because time is a conversion factor existing only in its confined-Plank's length level - and neither Space from Energy because Energy exists as the quanta on any first dimensional Unit AB -which is connecting the only two fundamental elements of Universe, that of points and that of energy in material dipole unit AB.
14. CONVERSION: Changes, Alters, the mechanism of Changes in something else or a copy of itself.
15. POTENTIAL: The sum of Work where it produces a Force when It acts.
16. EXPERIENCE: The conscious conceive of knowledge via the Objective and reflected to us reality.
17. EXISTENCE: This which Exists in Universe and can be measured inside Chaos, *That which it Is = The*

discrete. The composition of Existence is the joint of Oppositions. Quanta of energy is the first material dipole of existence i.e. (The Finite exists because of the opposite Infinite and this is the Potential of dipoles in tiny volumes).

18. BECOMING: This which Alters and is Altered in Universe and it is found inside Existence. Becoming is the Conversion (Evolution) where becomes, in various organized Levels of Matter with main Component, motion, and finally to the New Units and to the Material Worlds. This where it becomes, (Becoming) it is Twin because of the two directions of Units (Matter and Anti-Matter), via a symmetrical Transformation of any System and it is its Idol, *as Space and Anti-space*, so much in Spaces and also in Time. Stability of the infinite opposite directional forces presupposes equilibrium of vortices. Points of a Space with different lever-arms exert the equal and opposite Momentums for equilibrium i.e. The Opposite Momentum Rest curl Energy volume.

[C] Continuous transformations t-1, t-2, t-3, t-4. and conservation laws (time or space change - turn - addition - with elementary steps)

A : Continuous Transformation is a Natural System (a continuous Space with points, which are nothing) where it is moved or it is turned Territorial and it is temporally realized with successively elementary steps.

B : Discontinuous Transformation is a Natural System (a discrete Space with monads) where it changes the same System (continuous Space) to its Idol (to the discrete Anti-space), and is realized with one unique and indivisible step. This position defines correlation of Euclidean geometry (Point, line etc.) and Physics.

C : Homogeneity of Empty- Space and of Empty-Time.

The Empty Space is Homogeneous, that is to say each of its point is equivalent with all the other points wherever they are. Gravity field with material points, *the energy dipole*, is the empty homogeneous space beyond Planck's level.

All moved System remain unchangeable in Empty Space, and their Dynamic Energy is depended only from their Relative Place, and in the case of two Systems (a), (b) which may be (Points or masses also, which are the reactions to motions) is in effect the Principle of Equality, i.e. Action –

Reaction, and generally imposed as in table T-1.

<p>T-1 For \rightarrow F = Force, m = Mass, v = Speed, g = Acceleration, R = Impetus, then $F(ab) = F(ba)$ or $m(a)g(a) + m(b)g(b) = 0$ and after integration $\int F(ab)$, The Total Impetus is $\rightarrow m(a).v(a) + m(b).v(b) = \text{constant}$</p>			
That is to say Total Impetus From	$P = m(a).v(a) + m(b).v(b)$	$= \text{const}$	i.e. It Springs
Homogeneity of Empty Space \rightarrow	Principle of Equality Action of - Reaction \rightarrow	The Law of Conservation of Total Impetus ($\sum m.v$)	
Homogeneity of Empty Time \rightarrow	Principle of Equality Independent of Time \rightarrow	The Law of Conservation of Total Energy	

Table-1 : Conservation law of Total impetus become from Homogeneity of Empty Space and Empty Time .

This conclusion defines Virtual work principle which issues between Primary Point and Anti-point and Physical laws on monads (discrete space \rightarrow *The Non-existence*

becomes existence by Becoming).

D : The Isotopia of Empty - Space and of Empty – Time.

The Empty Space is Isotropic when all its Directions are Equivalent. That is to say, all Relatively Natural Sizes T =Kinetic energy and V =Dynamic energy , and Laws remain Inalterable with Rotation , therefore is in effect via,

$R(a)$ = The Place (Position) of the System (a), *the distance*, from a point 0.

$U(a)$ = The Impetus of System (a).

La = The Impulse of System from a beginning point 0.

Via two Systems (a) and (b),

Impulse $L = La + Lb = R(a).P(a) + R(b).P(b) = R(a).m$

(a). $\gamma(a) + R(b).m(b).$ $\gamma(b) = R(a).F(ab) + R(b).F(ba) =$

$R(a)F(ab) - R(b).F(ba) = R(ab).F(ab) = 0$ and since

$F(ab) = m(a).\gamma(a)$, $F(ba) = m(b).\gamma(b)$ hence is

$R(a).m(a).\gamma(a) + R(b).m(b).\gamma(b) = 0$ and is in effect $R(a).U(a) + R(b).U(b) = \text{Constant}$ i.e Conservation of Impetus,

Work $W = Fab.\delta ra = ma.(dUa/dt).dr = \frac{1}{2} d[ma.Ua^2] + Fba.\delta rb = \frac{1}{2}.d[mb.Ub^2]$ therefore Dynamic Energy change is $\delta V = - Fab.\delta ra - Fba.\delta rb$ therefore, $dV = d[\frac{1}{2}.ma.Ua^2 + \frac{1}{2}.mb.Ub^2]$ or $d(V+T) = 0$ or $V+T = \text{Constant}$

Momentum and Energy produced from Work as follows T-2,

<p>T-2 From $\rightarrow R(a).m(a).\gamma(a) + R(b).\gamma(b) = 0$ and $R(a).U(a) + R(b).U(b) = \text{Constant}$ then</p>		
From	Is in Effect	It Springs
Isotopia of Empty Space \rightarrow	The Total Turn of the System is Inalterable . The Force of two Bodies is in straight line where it links .	The Law of Impulse Conservation of $r.m.v$
Isotopia of Empty Time \rightarrow	The Dynamic Energy of the System is Independent of Time	The Law of Total Energy Conservation

Table-2 : Conservation law of Total energy becomes from Homogeneity of Empty Space and Empty Time .

E : Homogeneity of Empty - Time.

It is the case where do not exist Time Moments or also time periods where from alone them, they distinguish from remainder. That is to say each Time moment it is from alone Equivalent with any other and whenever. A Direct consequence of the Empty Time is that the Dynamic Energy of a System (a) or (b) does not depend from Time, but only from the Relative Places of the Elements where are the points, i.e. Energy-Space and not Space-time T-3

<p>From two Systems (a),(b) $\rightarrow E = \text{Work}$, $Fab = \text{The Force and}$ $\delta ra = \text{Displacement of a, b}$ $V = \text{Dynamic Energy}$, $T = \text{Kinetic Energy}$ i.e</p>		
From	Is in Effect	It Springs
Homogeneity of Empty Time \rightarrow	Inalterable in Time Changes of the Dynamic Energy of a System is Independent of Time	The Total Energy Law of Conservation, $DE + DK = m.g + \frac{1}{2}.m.v^2$

Table-3 : Kinetic and Dynamic energy are independence of time and become from Homogeneity of Empty Space and Empty Time .

Above conclusion define the time moments or time periods to be a relative measure of changes in any Dynamic energy system, Continuous or Discrete. Empty space and generally the beyond gravity space is \rightarrow Energy-space \leftarrow and not Space-time as in GR.

Isotopia of Empty – Time:

It can be said that it is the case where Time Intervals

follow one another there is a Continuous and Objective Flow of succession of Time, and because of Homogeneity of Empty Time and from, Isotopia of Springs => The Dynamic

Energy of System => The Total Energy laws

Empty Time is Independent of Time of Conservation as T- 4,

Territorial Reflection	→	Changes a System to its Idol	→	Symmetry of System – Idol $ra = -ra$
Time Reflection	→	Inversion of Flow – Time is equal to the alternation of Past with Future, or, does not exist also Objective Flow–Time	→	In Time t of the System and in time $-t$ of the Idol is in effect Symmetry $t = -t$, concerning any axis
T-4				

Table-4 : Dynamic energy changes a System to its Idol which is symmetrical in Space and Time .

F : The Principle of Relativity.

Excess Homogeneity and the Isotropic of Empty Space and Time, and also that the Laws of Mechanics remain Inalterable for Transformations of Constant Speed of light. The proof in [40-41]

Discontinuous Transformation (Temporally – Territorial) (The Territorial Reflection changes a System to its Idle or is: $ra = -ra$) → Virtual work Principle

(Time Reflection reverses the Flow of Time and consequently becomes an alternation of Past with the Future, that is to say does not exist objective Flow of Time where then is in effect Symmetry $t = -t$), Territorial Reflection is Anti-space where exists either in the tiny monads or in any other monad or body or System or anything which is in motion and simultaneously is in equilibrium, as this is the inner stability of wavelengths of monads which is obtained by the Evolute line of motion.

There is not existing any Flow of Time, neither any other inversion because, *Time is a relative measure of changes*, and not any other essence in transformations. A simplified approach of these Transformation exist on moving monads where this Model of this Transformation Exists in case of Two Equal and perpendicular Units OA and OB and they shape the Rectangle Isosceles triangle OAB on which are created all the Squares and Anti-Squares.

5.4. The Content of This Article is Binding Euclidean Geometry, Mechanics and Philosophy, Without any Assumptions and Definitions and Clearly Shows That,

- 1) The origin of Space [S] becomes, through the Principle of Virtual Displacements $W = \int_A^B P \cdot ds = 0$, from Primary Point A which is the Space, to B which is the Anti-space as the Inner distance of Space and Anti-Space.
- 2) The origin of Energy becomes, through the Principle of Virtual Displacements, as the Work of the Inner Impulse distance of Space and Anti-Space embedded in all points of universe.
- 3) The *minimum Quantized Space, Quanta, s^2* , are in all quantized Spaces, i.e. Particles, [MFMF] Field, moving vectors, free velocity monads, Material Points and lines → Surfaces and bodies.
- 4) The *minimum Quantized Energy, Quanta, $2s^2$* , is diffused in all quantized spaces as material volumes.
- 5) The definition of Material Point as (\pm) Dipole

Breakage in [MFMF] medium.

- 6) The definition of Material Object as the Wavelength, λ , of the (\pm) Dipole of [MFMF] Field which is a Standing Electromagnetic wave in tiny energy volumes and beyond Planck's cavity.
- 7) The Time in Euclidean geometry is not distinguished, because time is a conversion factor, *a relative measure of changes*, existing only in its confined-Planck's length level because there exists motion- and is neither Space from Energy - because Energy exists as quanta on any first dimensional Unit AB with infinite or zero time - which connects the only two fundamental elements of Universe, that of Points and that of Energy. Time is designated as the meter of changes, or as the conversion factor, between time (second) and space (mass) units and not essence of Space-energy Configuration. This age-old question, *of what is time*, was standing for many centuries in Philosophy, and was recently adapted by GR, by considering Time, as an essence of Space-time and accepting as base the wrong Non-Euclidean geometries.
- 8) The [STPL] line-cylinder as the passage of particles from Absolute [S] Frame to all Relative [R] Frames without any diffusion which consists the Navel cord, *the string*, of galaxies.
- 9) The geometrical Reasoning of Planck Length, Gravity's length, and all Spaces length.
- 10) Work as Energy is Quantized, converted, in Space monads, caves, $\bar{x} = d\bar{s} = \lambda m$, as pressure σ, τ , the pressure is converted in caves as a Standing Electromagnetic Wave [E,P] which consists the Standing monad (Displacement current) and the moving Energy monad (by altering the inner wavelength λ or Period T of monad) in Gravity's field medium [MFMF] and is dissipated as *Quaternion monads* (Particles or Waves, matter or vectors) as *Forces* (displacements, masses, pressure etc.) using modulus, coefficients, reactions to the motion and all other geometrical indices referred.
- 11) The Geometries related to the Euclidean by Lorentz factor, γ , consist, *The Geometrical expression of Spaces and Anti-Spaces in Relative systems*.
- 12) The Cause and Events as it is the Energy quantization in caves λ and the velocity Breakages as, masses, and velocity, \bar{v} , only is the Thrust of masses.

- 13) The Origin and the base of Gravity from [S] to [R] frame, and the Equations of the inner Electromagnetic wave.
- 14) The Structure of the Energy - Space Universe and the boundaries of the Space-time of General Relativity.
- 15) The Origin of Particles from velocity - The Thrust - on Breakages and the Breakages as the Fragments of the Space, Anti-Space collision, of a cave.
- 16) The Origin of Color - forces from the Retardation and the Birefringence of Spaces.
- 17) The Dual nature of Monads, of wavelength $|\lambda|$ as Particle, and Wave as the Stationary Electromagnetic Wave in $|\lambda|$, which is an intrinsic property of the Cycloid motion of velocity, \bar{c} , and Spin, forming the plane and spherical standing waves which are < The Inner structure of Particles >.
- 18) The Cycloidal motion as the intrinsic property of vectors which is a Stationary wave on wavelength of vector, where < Poincot's ellipsoid > becomes \rightarrow cycloid Ellipsoid,
- 19) The mechanical relation between the speed of light and principal stresses, guided to, Permittivity, Permeability, in free space medium.
- 20) Michelson's-Morley experiments cannot prove reality because in Planck's cave occurs isochrones motions, and Gravity is the force (*energy*) which is connecting the Material points of the Medium with the constant light velocity \bar{c} . The Relative motion of moving systems through Stationary system can be detected only by the Tangential velocities $\bar{v} = \bar{\omega} \cdot r$ on circumference of a cave, r , with radius $R > r$.
- 21) The equations of inner Structure of Gravity field and the stability of the whirling Space, Anti-space, the Spin, are extended to moving monads.
- 22) The immense confusion in the basic ideas regarding the Quantized Energy-Space, *The Quanta*, \rightarrow vanishes.
- 23) The Manifold of mathematics from Astrophysics to Quantum mechanics have been progressively developed on Non-Euclid Geometries, resulting to Relativity's Space-time confinement, unable to conceive the under Planck's cavity energy existence. The only two fundamental elements of Universe, is that of Space (*points*) and that of Work = Energy (*motion*) and is the only way to explain outside Reality.
- 24) In article is presented the Creation Hypothesis without Big-Bang and without any other coherent Energy-level. An extend elucidation has been previously done for some very important definitions as that of Quanta of Space and the Quanta of Energy. The expansion of the universe occurs by THE rolling, of the light velocity Moving Dark-Matter - Energy Heap mixture, on the Rest Gravity-Field-Energy Base, which consists a parallel motion and not parallel universes as said. It has been elucidated the Origin and the Nature of Particles Fermions and

Bosons, what is Gravity - field, Gravity - force, Dark - matter and Dark-energy. It was analyzed that Gravity-field is a Rest of two opposite signed elements which consist the minimum energy quanta Spinning space and this because of dipole nature, and jointed by the Gravity-force which is the Maxwell's-Gravity's Displacement current, and which acts on any other moving or not particle. Because Dark-matter moves with the constant velocity, c , and is composed of the two opposite signed elements also, and Dark-energy moves also with velocity of light, so is continually effecting on the two fragments separately and are slinging them further, formulating the Infinite and attracting Geometrical Universe, i.e. Thrust $[\bar{c} \cdot \bar{v}_i]$ with light velocity, \bar{c} , acting on the five Energy and Space Fragments $\rightarrow \{ (\bar{v}_i), (+s^2), (-s^2), (+cs^2), (-cs^2) \}$ and on $\rightarrow [(\bar{v}_i) \rightarrow (+s^2) \leftrightarrow (-s^2)] =$ The Energy-dipole Gravity-field] and also on $\rightarrow [(\bar{v}_i) \rightarrow (+cs^2) \leftrightarrow (-cs^2) =$ The Energy-dipole Gravity-Dark-matter - field] carrying them in the three dimensional parallel space with the light velocity, \bar{c} , as the Rest Gravity -field - Energy, and the rolling Movable Heap on it, the Dark-matter-energy, or the mixture of the spherical and opposite signed elements and which highlight, and the dipole from them jointed both by the Gravity force, which form the heavy and massive invisible Dark matter, the dipole energy blobby volumes which are the massive Dark Fringes which repel. This is the Expanding universe without Big-Bang, based on Euclidean Geometrical logic only, which is the outer reality of it, and not on Axioms and Postulates which do not agree with this Physical reality.

- 25) In summary, my personal confidence is that nature is produced from Euclidean Geometry only { i.e. \rightarrow from Primary Point A which is nothing (the non-existence) by becoming Anti-point B (the opposite to non-existence also) as Segment AB, (discrete = existence = monad), which Equilibrium by opposite forces following Virtual work and thus being the Quaternion (the monad AB as Space AB and as energy equal to Virtual work) and consisting the Primary Neutral Space. The accumulation of disarrangement of Sub - Spaces leads to a powerful vortex from the infinite small vortices, which by entering in geometry caves, and through the most important Geometrical mould [the STPL cylinder] on cave, where there \rightarrow Spaces (A), Anti-spaces (B) and Sub-spaces (AB) co-exist on a common circle of diameter AB, and by the composition of opposites (the dipole $\rightarrow [+ \leftrightarrow -]$), produce through the quantization of energy to quantization of Spaces, to Particles, to Gravity-field-forces, to Dark-matter-gravity forces, following Geometry principles which become thus Physical }, and not from any other logical starting point.

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