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New Physics – The Negation of Einstein's Theories of Relativity

The *Real* Phenomenology of Space-Time-Matter-Motion

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Abstract

From ontological considerations alone, a new revolutionary quantum dynamical-materialist dialectical (Quantum Dialectics or QD) perspective of space-time-matter-motion achieves a new quantitative mass-energy-velocity relation for any ponderable fundamental particles. This new relation, based on the quantum uncertainty principle, gives the mass m of any free fundamental particle at its origin, in terms of the inverse cube of its velocity v. This quantitative relation is different and is a negation of the one derived from mechanical-metaphysical (Classical Mechanics or CM) approach since Isaac Newton and its relativistic post-quantum formulation of Albert Einstein. This new mass-energy-velocity relation is in conformity with known knowledge and is appropriately substantiated by the recent reports that *"high-energy photons of gamma radiation from a distant galaxy arrived at Earth four minutes after lower-energy photons, although they were apparently emitted at the same time";* and another saying that *"the time delays of gamma-ray photons are inversely proportional to their energy".* These findings would contradict Einstein's theory of relativity, which says that all photons (particles of light) must move at the same speed c.

QD considers matter-antimatter particle pairs in their elementary virtual forms and kinetic motion as an eternal quantum dynamical process of existence and non-existence (Being-Nothing) arising from abstract space and abstract time in a contradiction to each other. The virtual particles can transition to real particles through quantum tunnelling or when equivalent energy becomes available. Any existence in this view is a contradiction; vulnerable to change, motion, evolution, development etc. The aggregation of the elementary particles and their motions mediated by chance and necessity, give rise to the phenomenology of this infinite, eternal and ever-changing universe.

The CM approach on the contrary is based on epistemology and considers that matter (ordinary + light) and motion have an esoteric origin from the mystery of the single act of creation by God; of a finite universe in the finite past; where the premise of conservation laws and *"ex nihilo nihil fit"* prevail. In its relativistic version, this approach makes a fundamental difference between ponderable matter and light and in fact question the existence of particulate matter. Two axiomatic assumptions, one by Newton of one-sided universal gravitational attraction and the other by Einstein that the velocity of light c is an absolute and universal constant has brought in unphysical objects and phenomena into scientific discourse leading to century-long confusion and scholastic debates among the physicists; with no end in sight!

Keywords: Space, Time, Matter, Motion, Quantum, Dialectics, Mass, Velocity, Relativity

Introduction and A Brief History:

1. Epistemology and Ontology:

The modern developments about the notions of space-time-matter-motion in particular and natural science in general dates back to the Early Greeks and were based on epistemology alone, as all things and processes in the world was considered to be *"GIVEN"* as they are. But the scientific question of how things came to *"BE",* could only be an issue of faith, mythology, belief, speculation, intuition etc., and had to wait, as would be shown later in this study; for the discovery of the quantum phenomena at the turn of the 20th century.

The epistemological understanding of the world proceeded along two major streams of world views, identified by G.W.F. Hegel (1770 – 1831) as the *"view of understanding"* or metaphysics and the *"view of reason"* or dialectics. The two world views ironically based on two opposite notion of reality – stasis vs. dynamis or change; was credited to two Greek near contemporaries Parmenides (515 -450 B.C.) and Heraclitus (544 – 483 B.C.) respectively. Metaphysics, based on causality and formal (Aristotelian) logic, views the world as consisting of unchanging polar opposites according to the principle, ***"Unity, Opposition, and the excluded Middle"*** leading to an unchanging stasis; change, in this view can come only from some external force or impulse. This is also the derived habit of ordinary (un-reflected) thought of our good old commonsense of everyday life – our evolutionary heritage for instant and more or less instinctive, impulsive reaction or judgment.

For dialectics on the contrary, the principle is ***"Unity-Opposition",*** no excluded Middle to separate the opposites and hence the **"Contradictions" (unity of the opposites),** making them vulnerable to change, motion, development, evolution etc. Heraclitus, with his insight-full intuition posited the brilliant germ of dialectics with the following immortal words, ***"Everything changes due to inner conflict (contradiction)"***. According to this view any existence at all, is a contradiction of unity and opposition, the primary and most fundamental contradiction is ontological ***"Being-Nothing"***. For dialectics, any contradiction, because of rational necessity must resolve to another higher or lower contradiction in a series of discrete progression; through which Nature, Life, Society and Thought; in other words - the manifestation of the Infinite, Eternal and the Ever-changing universe operates unguided; but mediated by blind chance with an iron necessity that is inherent in chance itself [1]. Dialectics does recognize the polar opposites, but consider them as only of relative validity. Hegel [2] explained this distinction in the following way: "*But it is one of the fundamental prejudices of logic as hitherto understood and of ordinary thinking that contradiction is not so characteristically essential and immanent a determination as identity; but in fact, if it were a question of grading the two determinations and they had to be kept separate, then contradiction would have to be taken as the profounder determination and more characteristic of essence. For, as against contradiction, identity is merely the determination of the simple immediate, of dead being; but contradiction is the root of all movement and vitality; it is only in so far as something has a contradiction within it that it moves, has an urge and activity."* Hegel's ontological speculation of "Being-Nothing-Becoming" in his philosophy of space and time, in a very obscure and speculative way anticipated the virtual particles of the quantum vacuum, long before their discovery at the turn of the 20th century [3]

2. <u>The Difference in the Metaphysical and the Dialectical View of Motion</u>:

The great philosophical question of the early Greeks: What is primary: Thought (including products of thought, i.e., Mathematics) or Matter; Spirit or Nature; Idealism or Materialism; was somewhat settled through the works of Aristotle (384 – 322 B.C.), in favour of materialism over the preferred idealist views of the established order and theology of that period. Modern natural science in a general sense has roots in the works of Aristotle. By 15th century, Nicolas Copernicus' (1473 – 1543 A.D.) revolution overthrew the long-held Geocentrism and the Ptolemaic Epicycle of the planetary system preferred by the established order and theology, in favour of Heliocentrism. This revolution brought in great turmoil in Europe and ushered in the unprecedented proliferation of scientific and social development known as the renaissance. But dispute and in essence reaction to the Copernican revolution soon developed over whether the planets moved in a perfectly circular orbits as mathematical idealism dictates or in elliptical orbits, as theorized by J. Kepler (1571 – 1630 A.D.); based on the observational data of Tycho Brahe. The perfectly circular orbits with uniform motion and momentum, is in conformity with the Ptolemaic and the esoteric view of God's creation of the world (matter and motion) with a "First Impulse".

Meanwhile, even before Kepler's three laws of the planetary motion, G. Galileo (1564 – 1642 A.D.) gained fame through his dispute with the Inquisition, invention of the telescope and discovery of the inverse square law of "Free Fall" of objects in terrestrial Nature. But unfortunately, Galileo rejected Kepler's empirically determined elliptical orbits of the planets, even after repeated pleas from Kepler [4,5]; in favour of the ideal circular ones. Galileo's fame and authority thus in essence set theoretical physics and cosmology on a wrong and unscientific course that continues even today, after few hundred years! As it would be shown later, Isaac Newton (1642 – 1727 A.D.) took advantage of Galileo's work, fame and his opposition to elliptical orbits of Kepler, to advance his own theory of universal gravitational attraction based on circular orbits. This way, Newton in practice brought back the Geocentrism of theology; undoing the spirit of the Copernican revolution; vulgarising Kepler's Laws; and thereby set theoretical physics and cosmology towards fantasy (aggravated later by Einstein's theories of relativity); against the vehement opposition of G.W. Leibniz's (1646 – 1716 A.D.) proper physics and mathematics.

Leibniz argued that matter has intrinsic residual motion in any association, which he termed as ***vis viva*** and in the planetary motion it is represented as the centrifugal force of the planets orbiting the sun, leading to an elliptical orbit. Leibniz took into account both the centrifugal and centripetal forces and derived the radial acceleration expressed as: d^2r/dt^2 = a/r^3 – b/r^2, where a and b are constants and r is the radial distance from the centre of attraction, the first and the second terms on the righthand side are the centrifugal and the centripetal forces respectively. Newton on the contrary denied centrifugal force and insisted that the planetary orbits are perfectly circular, making a perfect equilibrium and proposed his one-sided law of universal gravitational attraction as is observed in Galileo's "Free Fall" in the terrestrial case. Newton ignored Kepler's First and Second Law and simply put a proportionality constant in Kepler's Third Law, which states that the squares of the sidereal periods of the planets are proportional to the cubes of their semimajor axes. The proportionality constant (4π^2/GM) gives Newton's formula t^2 = (4π^2/GM) L^3, where G is the gravitational constant and M is the mass of the sun, t is the sidereal period and L is the semimajor axis of the planet.

Based on his philosophical notions of space, time, matter and motion; Hegel made fundamental distinction between "finite mechanics" on terrestrial earth and the "absolute mechanics" of "free motion" of the heavenly bodies – a distinction that Newton eliminated with his mystical "force". Kepler's Third Law does not refer to any mysterious force, but only in terms of what Hegel called the "absolute dynamics" of "absolute free motions" of the cosmic bodies, which are mediated by the contradiction of attraction of "free fall" and the repulsion of the tendency to "fly away". It must be noted that in terrestrial "Free Fall", the relation of the distance L traversed in time t is given by L/t^2, whereas for the planetary system of Kepler, the relation is L^3/t^2. The ratio of the two L^2 represent the "absolute free motions" of unitary matter. [6,7]; which would be of immense importance in deriving the new mass-energy-velocity relation as discussed below.

Galileo, unfortunately made a second major wrong judgment on the question of motion harmful to physics, that continues till today. As F. Engels [8] pointed out, *"Galileo discovered, on the one hand, the law of falling, according to which the distances traversed by falling bodies are proportional to the squares of the times taken in falling. On the other hand, as we shall see, he put forward the not quite compatible proposition that the quantity of motion of a body (its impeto or momenta) is determined by the mass and the velocity in such a way that for constant mass it is proportional to the velocity. Descartes adopted this latter proposition and made the product of the mass and the velocity of a moving body quite generally into the measure of its motion".*

Leibniz showed that *"The same force is required, to raise a body of four pounds in weight one foot as to raise a body of one pound in weight four feet; but the distances are proportional to the square of the velocity, for when a body has fallen four feet, it attains twice the velocity reached on falling only one foot. However, bodies on falling acquire the force for rising to the same height as that from which they fell; hence the forces are proportional to the square of the velocity."* [8]. Since Newton, modern physicists follow Galileo and Descartes's wrong formulation of momentum mv rather than the correct term mv^2 determined by Leibniz. The issue of the unexplained "hidden momentum" in Maxwell's equation in one of the manifestations of Leibniz's vis viva and the extra v term in the momentum mv of Galileo! It will be shown later, that taking into account the dialectical approach of Leibniz and Hegel, the discrepancy of L^2 and the extra v in the conventional momentum (as discussed above), gives an energy-momentum relation radically different from that of both Newtonian and Einsteinian physics.

It is quite clear that, unlike Newton's view, the contention of Leibniz and also of Hegel's dialectics is that the centrifugal and the centripetal are two different and independent forces acting on the planets and the comets. So, Newton's axiomatic and one-sided theory of universal gravitational attraction is patently wrong. It is therefore obvious on the basis of new knowledge of the cosmos [6]; that the anti-dialectical Newtonian concept of gravity as a unidirectional universal attractive force and later, Einsteinian esoteric theories of relativity based solely on the axiomatic truth of the universally constant velocity of light and mathematical idealism have only helped the proliferation of theological mysteries and unknowable dark/black cosmic objects, but no positive knowledge of the cosmos.[9]

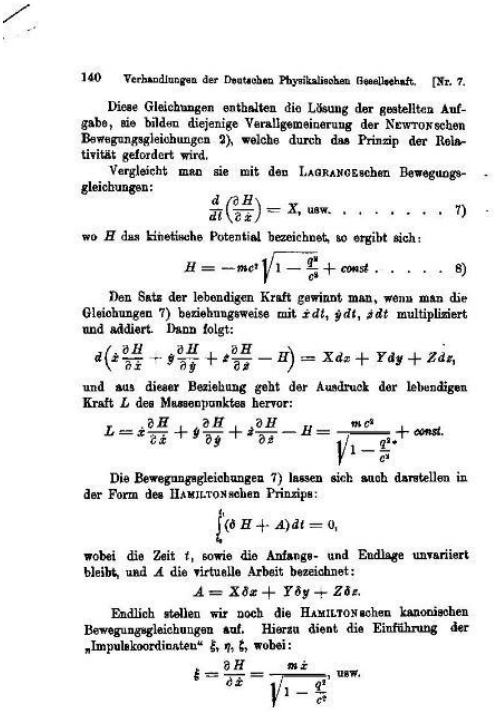
3. <u>The Difference in the Metaphysical and the Dialectical View of the Mass of Photons and the mass-energy relation</u>:

Light (visible) was always a mystery for man since prehistory; as something very different from other objects, as it seemed to arise instantly and also vanish instantly. All kinds of mythology developed among most people of early civilization about light as something holy, pure and divine.

It was only around 1000 AD, an Islamic scientist named Abu Ali Hasan Ibn al-Haitham (known in the west as Alhazen) used a combination of logic and experimentation to show that light is something material that entered into human eyes to produce vision. In the seventeenth century, a debate erupted about the form of light. Christiaan Huygens believed light was a wave, while Isaac Newton argued that it was composed of particles. This debate continues till today through the works of Thomas Young (wave) and specially James Clerk Maxwell, showing that light is a form of transmitted electromagnetic form of energy. But the confusion deepened after the discovery of the quantum phenomena; and through the works of Max Planck, Albert Einstein; which brought in the unintuitive idea that light behaves both as particle and wave simultaneously.

The idea of the particle nature of light brought in another unresolvable question, does it have "mass" like most other tangible material objects - solid, liquid, gas; which are now known to be composed of atoms and molecules. The general perception that light seemed to be very different from other material object and even the stranger apparent phenomena that light seems to travel with a constant velocity, no matter in what reference frame, brought the greatest confusion among the physicists since the discovery of the quantum phenomena at the turn of the 20th century and still rages on. Both light and matter, it turns out, exhibit properties of both waves and particles. Termed as wave-particle duality, this is a central concept of official quantum mechanics. The notion of special relativity (SR) that the velocity of light is an absolute constant in any internal reference frame (IRF) came in conflict with the classical behaviour of other

ponderable matter particles, which show inertia and variable speed with imparted force. To be compatible with Special Relativity (SR), Einstein in 1905, following gross simplification of previous works [10,11], claimed that mass is not only proportional to energy by the (idealized) relation, E = mc^2, but that the mass (m) of any ponderable particle must increase with velocity v, given by the Lorentz gamma factor as m = γ x m0; where γ = sqrt 1/(1 - v^2/c^2) and c is the velocity of light [12]. However, this relation fails in the case of photons, if one conders their rest mass to be zero. There is a lot of confusion till today among the physicists about the validity of velocity dependent mass of ponderable matter. In the case of light as Maxwell's electromagnetic radiation, an electromagnetic mass is inconsistently considered as inertial mass of the photons and the momentum p (m x c) as implied by De Broglie's momentum-wavelength relation is used. In other words, a lot of arbitrary tricks has to be used to express the mass of photons, its momentum and the mass-energy relation [13]. The original derivation of mass-energy relation by M. Planck is shown in the following image



140 Verhandlungen der Deutschen Physikalischen Gesellschaft. [Nr. 7.

Diese Gleichungen enthalten die Lösung der gestellten Aufgabe, sie bilden diejenige Verallgemeinerung der NEWTONschen Bewegungsgleichungen 2), welche durch das Prinzip der Relativität gefordert wird.

Vergleicht man sie mit den LAGRANGEschen Bewegungsgleichungen:

$$\frac{d}{dt}\left(\frac{\partial H}{\partial \dot{x}}\right) = X, \text{ usw.} \quad \ldots \ldots \quad 7)$$

wo H das kinetische Potential bezeichnet, so ergibt sich:

$$H = -mc^2\sqrt{1-\frac{q^2}{c^2}} + const \quad \ldots \ldots \quad 8)$$

Den Satz der lebendigen Kraft gewinnt man, wenn man die Gleichungen 7) beziehungsweise mit $\dot{x}dt$, $\dot{y}dt$, $\dot{z}dt$ multipliziert und addiert. Dann folgt:

$$d\left(\dot{x}\frac{\partial H}{\partial \dot{x}} + \dot{y}\frac{\partial H}{\partial \dot{y}} + \dot{z}\frac{\partial H}{\partial \dot{z}} - H\right) = X\,dx + Y\,dy + Z\,dz,$$

und aus dieser Beziehung geht der Ausdruck der lebendigen Kraft L des Massenpunktes hervor:

$$L = \dot{x}\frac{\partial H}{\partial \dot{x}} + \dot{y}\frac{\partial H}{\partial \dot{y}} + \dot{z}\frac{\partial H}{\partial \dot{z}} - H = \frac{mc^2}{\sqrt{1-\frac{q^2}{c^2}}} + const.$$

Die Bewegungsgleichungen 7) lassen sich auch darstellen in der Form des HAMILTONschen Prinzips:

$$\int_{t_0}^{t_1}(\delta H + A)\,dt = 0,$$

wobei die Zeit t, sowie die Anfangs- und Endlage unvariiert bleibt, und A die virtuelle Arbeit bezeichnet:

$$A = X\delta x + Y\delta y + Z\delta z.$$

Endlich stellen wir noch die HAMILTONschen kanonischen Bewegungsgleichungen auf. Hierzu dient die Einführung der „Impulskoordinaten" ξ, η, ζ, wobei:

$$\xi = \frac{\partial H}{\partial \dot{x}} = \frac{m\dot{x}}{\sqrt{1-\frac{q^2}{c^2}}}, \text{ usw.}$$

The velocity dependent mass or relativistic mass involving the Lorentz Factor (gamma) is touted as one of the marvels of SR; which is supposed to be vindicated by the workings of the particle accelerators. But published works by this author [14] have demonstrated that the Lorentz Transforms (LTs), including the gamma factor and the 4-D "spacetime" abstract manifold, on which most of relativistic and modern theoretical physics are based; are nothing but arbitrary and brain-cooked geometrical/mathematical phantoms, which have no basis in objective reality and hence contrary to scientific norms. The exponential relation of the particle accelerators can be equally well explained due to the progressive loss of energy of the accelerating particles to the virtual particles of the quantum vacuum, making them real particles. Also, the observed faster than velocity of quasars and other cosmic object would be impossible, if any relativistic mass increase is real [16].

4. The Quantum Conundrum:

The wave/particle duality, uncertainty, non-locality etc., of the quantum phenomena were greatly at odd with the metaphysical concept of matter based on causality and formal (Aristotelian) logic based on the notions of certainty, determinism, continuity etc. Einstein, himself one of the founders of the quantum theory, was much troubled by its apparent failure to respect some of the cherished metaphysical principles mentioned above. Einstein rejected the quantum phenomena as being unreal and led the theoretical physicists at the turn of the 20th century to find certainty in the absolute and the invariable speed of light as an objective truth of reality and the world must be explained on the basis of this axiomatic truth. The insufficiently sensitive and inaccurate measurement of so astronomically high value of velocity of light by the Morley-Michaelson experiment showing a constant value was the *cause célèbre* for Einstein to proclaim the axiomatic truth of the absolute constancy of the speed of light c.

Based mostly on geometrical and ideal mathematical considerations, the joint efforts of the European physicists of the time ventured upon the task of finding the manifestation of the truth of constant c in the workings of Nature from the quantum to the cosmic! But this effort led to unphysical and un-intuitive concepts of an abstract 4-dimensional "spacetime" manifold of reality, with tangible material, physical, metrical etc. attributes; the notions of length contraction; time dilation; velocity dependent mass etc.; dark/black cosmic objects and so on without any end! These seemed to be the exact opposite of the notions of classical dynamics, including much substantiated electrodynamics of C. Maxwell. And most of all, the concept of classical matter and motion – the most fundamental attribute of any existence, themselves became a myth for new relativistic physics! This was expressed by Einstein [15], in the following way, *"Since the theory of general relativity (GR) implies the representation of physical reality by a continuous field, the concept of particles and material points cannot play a fundamental part and neither can the concept of motion. The particle can only appear as a limited region in space in which the field strength or energy density is particularly high".*

The extension of the axiomatic truth of the universal gravitational attraction and the constant G of Newton, with the axiomatic truth of the universal constant velocity c of light of Einstein, to the realm of cosmology has led modern physics to the concepts of esoteric objects and phenomena; which seem highly unlikely to be credible; in spite of the vigorous attempts by official science to "prove" their existence. The concerted efforts by official science in the realm of the macrocosm of the galaxies and the microcosm of the quantum world seem to be to make physics preach theology [9]

The Derivation of the Quantum-Dialectical (New) Mass-Energy-Velocity Relation:

For dialectics, motion is the mode of existence of matter. So, there can be no matter without motion and no motion without matter. For Hegel's philosophy, space and time are abstract entities. Space, time, matter and motion are in a dynamical and dialectical relationship among themselves giving rise to the observable phenomenology of the universe: Hegel's space and time have only virtual existence without any tangible quality, but only have potential quantitative nature - the spurious or —bad infinity. Space and time become meaningful only in the context of matter and motion [3]. Space and time represent the contradiction of dialectical unity of the opposites that resolve itself into matter and motion. *"Motion is the process, the transition from time into space and vice versa: matter on the other hand, the relation of space and time, as latent identity. Matter is the primary reality, the existing Being-in-itself; it is not only abstract being, but positive persistence of space, as excluding, however, other space"* (17). Hegel elaborated the dialectical view of motion in the following way: *"Its essence [of motion, AM] is to be the immediate unity of space and time; it is time really persisting through space, of space which is only made truly distinct through time. Thus, we know that space and time belong to motion; the velocity, the quantum of motion is space in relation to a definite time that has elapsed. One says also, motion is the relation of space and time; the deeper manner of this relation, however, remained to be grasped [Hegel did not elaborate the "deeper meaning" of this relation, AM]. Only in motion have space and time reality"* (18).

The *"deeper meaning"* of the relation of space and time become apparent now only after the concept of virtual particles of the quantum vacuum; since Paul Dirac's revolutionary works. The abstract contradiction of space and time can transition to the virtual particles of the quantum vacuum as particle/antiparticle pairs, which continuously pop in and out of existence as "Being-Nothing" of the ontological first as well as the last dialectical contradiction. As we now know, the virtual particles can transition to real particles through quantum tunnelling or when equivalent energy becomes available; mediated by blind chance but an iron dialectical necessity inherent in chance itself. For dialectics, chance is blind only when it is not realized in a necessity and necessity is sterile until fertilized by a chance!

For Hegel's dialectics, a quantum of matter is the chance persistence a quantum of space in time, and a unit of motion is the chance persistence of time in space in the form of virtual particles, eternally flipping in and out of existence, in the infinite quantum vacuum. This can be expressed quantitatively as a quantum energy-action relation as follows:

$$\text{delta } L^3 \times \text{delta } t = h/4\pi \qquad (1)$$

where Delta L^3 represent a quantum unit cube of space of length L; delta t, represent a quantum of time of the existence of the quantum of energy and h is the Planck constant. The cube of space could also be represented by a unit sphere of radius r and volume $4/3(\pi r^3)$, but for simplicity, we will consider only the cube of space.

As discussed above, Hegel quantified the ratio L^2 (of Keplerian and Galilean gravity) as the "Absolute Free Motion" of matter at its creation in the quantum process. This free motion of a quantum particle can only be of kinetic (translational) motion and in its real manifestation can be expressed as $1/2(mv^2)$, where v is its velocity.

Rewriting equation (1) for a single quantum act (eliminating delta) and L^2 substituted as $1/2(mv^2)$, we get:

1/2(mv^2) x L x t = h/4π, (2)

where L, the distance in real sense (not virtual) is given by L = v x t. Substituting L in equation 2, we get:

1/2(mv^2) x v x t x t = h/4π, (3)

We would also recognize L^2 in Hegel's Absolute Dynamics discussed above and about the factor v of Leibnizian momentum mv^2 and Cartesian mv, i.e. mv^2/mv = v

Equation (3) can be expressed in terms of m as follows

m = h/2π/(v^3 x t^2) = ƙ x E/(v^3 x t^2) (4)

where ƙ is a proportionality constant and E is the real energy involved in the appearance of a particular quantum particle from its virtual state. It should be mentioned that t is the lifetime of a virtual or a real singular quantum particle in this quantum action, is a constant for that particle and has no significance in the above relation. It only shows that lifetime of a real or virtual particle is dependent on its mass. A particle like photon with insignificant (but mass> 0); will have a very long life and vice versa. At the virtual level any range of virtual particle can continuously arise and pass away as "Being-Nothing", where their mass, motion and lifetime is determined by the relation (4). But there has to be a selection rule for the probability of a virtual particle to become a real particle dictated by its ***necessity*** in the real world! This must be the reason for the abundance (matter-antimatter pair) of photons, electron-positron, proton-antiproton etc.; which mutually aggregate to form other matter mass in the universe; mediated by chance and necessity, following the laws of quantum dynamics and dialectics.

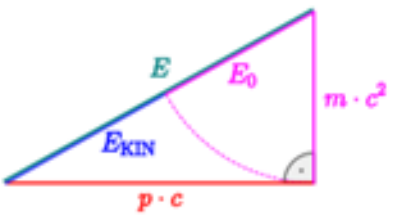
Now, the most important significance of the equation (4) for this discussion, lies in the relation between, mass, energy and velocity of an emergent quantum particle, photons included and unlike in the theories of relativity, where a photon must be massless. For the quantum-dialectical relation like the equation (4), any quantum particle at all, must have mass, otherwise the original contradiction of space and time and hence "Being-Nothing" will vanish, which is an impossibility for dialectics!

For equation (4) to be valid in the case a particle of mass m and energy E, its velocity must be in inverse cube (1/v^3) relation with mass m. This is a new and revolutionary intuition that comes from the quantum-dialectical consideration of objective reality, for which, no distinction or restriction of the mass of a tangible particle has to be made. This is consistent with classical mechanics or even electromagnetism, but grossly in variation with the theories of relativity.

If the distinction between the velocity of light and of massive particle is eliminated, the mass m of a particular quantum particle in Lorentz energy-momentum relation becomes proportional to the inverse square (1/v^2) of its velocity., as shown below:

E^2 = (pc)^2 + (m0c^2)^2

Represented by Pythagorean geometry as:



Replacing c with a general term v and m as the invariable mass, eliminates the Pythagorean geometry; which as is shown elsewhere [14] was the basis of LTs, the gamma factor and "spacetime" abstract manifold!

We now get E^2 = (mv^2)^2 + (mv^2)^2

Or E = sqrt 2 x mv^2

Or m = E/(sqrt2 x v^2

A superimposed Desmos plot of m = 1/v, m = 1/v^2 and m = 1/v^3 are shown in the following figures

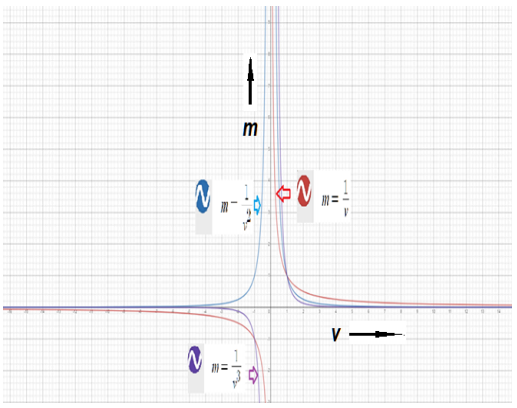


Fig. A

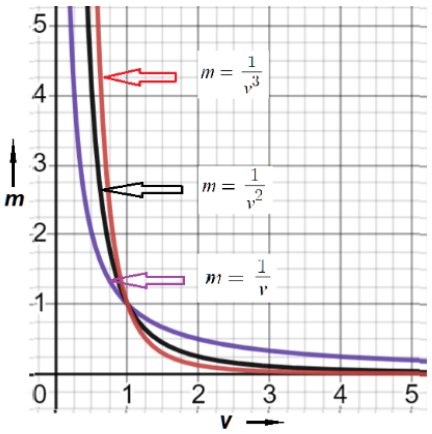


Fig. B

Fig. A is the superimposition of the three equations and Fig. B shows only the upper-right quadrant in a closer form. It is obvious from these figures that any particle of mass close to zero must possess very high velocity and a little change in mass makes very little (undetectable) difference, most acutely when m -> 1/v^3 - a fact that led to the false assumption of absolutely invariable velocity of light.

As is evident from these figures, even the microwave photons must have some finite mass, otherwise the contradiction of space and time or equation [1} does not make any sense. The assumption by Einstein that mass of any photon must be zero, is a gross logical fallacy and is scientifically meaningless – the reason why all these fantasies of time dilation, length contraction, relativistic mass, and other unintuitive things and phenomena flourishes in modern physics and cosmology!

What is obvious from these figures is that at the very low mass region, say up to the visible range of the EM spectra, a little change in mass does not make much difference in their velocities, and hence apparently seems to be constant. This effect is much more dramatic when v = 3, in the quantum-dialectical derivation. But a gamma ray photon containing a combined mass of electron and positron cannot have the same velocity c like the microwave photons, for example. This is also the reason why massive particles like gamma ray photons, electrons etc. must have some directional propagation [19], as explained by the mechanism of real/virtual exchange of propagation.

The prediction from this work that gamma ray photons must have velocity less than microwave or visible photons is now verified by the MAGIC (Major Atmospheric Gamma-ray Imaging Cherenkov) telescope [20]. It found that *"high-energy photons of gamma radiation from a distant galaxy arrived at Earth four minutes after lower-energy photons, although they were apparently emitted at the same time. If correct, that would contradict Einstein's theory of relativity, which says that all photons (particles of light) must move at the speed of light* [20]. Another study [21] showed similar delay in gamma rays' arrival time from distant galaxies and in addition showed that *"the time delays of gamma-ray photons are inversely proportional to their energy"*; as a direct validation of the prediction of this new physics.

Conclusion:

The only rational development of theoretical physics should have been a natural and direct transition of Maxwell's electrodynamics to quantum electrodynamics; as the discovery of the quantum phenomena (which no one could even imagine before) was a revolutionary development in natural science, even much more significant than Darwin's revolutionary theory of evolution, conforming to materialist dialectics. The works of brilliant astrophysicists and astronomer like Halton C, Arp, V. Ambartsumian, F. Hoyle et al., should have similarly, led natural science and cosmology to its natural dialectical perspective [22, 23], but unfortunately was not.

The need of the requirements of class rule and the strict implementation of the ruling ideas and myths, meant that physics had to take a century-long, useless, costly and time-consuming detour with Einstein's theories of relativity - a great loss for humanity! And what is even more tragic is the possibility that physics may still be far away from reaching the end of its nightmarish tunnel!!!

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