Relativistic Atomic Model

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Abstract: *Light is emitted from excited orbiting electrons of an atom at speed 'c' in space outside the respective atom. Hence, the orbiting electron which released light photons at speed 'c' must be rotating at linear speed 'c'. The electron and proton fields inside atom are fully engaged with each other respectively. Then, how the work done by revolving electrons in different orbits is not spilled out from the atom. How the space inside atom is filled with electric charge giving it full unique electrical permittivity. When the electric fields are fully engaged mutually between electron and proton, what will be the mathematical relation of force and field? Why the electrons follow, the rule for their number in orbits as $[2n^2]$ where 'n' is orbit number counted from nucleus outwards. Why uncertainty principle is obeyed by orbital electrons. What does it mean, energy is consumed in work. How in nuclear reaction an electron is converted into radiation photons. The force of attraction is fundamental eternal force in the universe. An ingenious original theoretical effort based on scientifically known facts is done by the author in this Research Article.*

Keywords: Atomic Model, Orbiting Speed 'c', Opposing force, Electromagnetic Attractive Force, Permittivity. Dark Energy, Dark Photon

1. Introduction

Deficits in Bohr Rutherford Atomic Model and Relativistic Solutions Applied: Since the year 1902, Atomic Model explaining internal structure and internal behavior of elementary particles internal to an atom, remained have been being developed till now; quantum theory is also accommodated in it. Rutherford Bohr Model, which came in 1013, has remained and will remain eternal by accommodating, Physical theories developed time to time; and it is capable to do so, in future also. Because it is based on basic natural behaviors of massive objects in nature; as the model represents our solar system, electrons moving in different orbits around conman center of nucleus. Rydberg's formula for the spectral emission lines of atomic hydrogen, found its place in Physics, on this atomic model. Rutherford Bohr atomic model sustained, Quantum Theory, Quantum Mechanics, energy level theory, Valance shell atomic model, Planck's Theory of radiation of energy, Maxwell's Theory of Electro-Magnetic Radiation, the classical orbiting theory, de Broglie's standing wave principle, and similar but more explanatory Werner Heisenberg's Quantum Mechanics Theory, Erwin Schrodinger modified the Quantum Mechanics Theory, to explain, how, energy inside an atom is not consumed and not radiated outside the stable atom, though the electrons do work in orbiting around nucleus. It is because the orbiting electrons inside an atom maintain the total internal energy of an atom, by transferring their energies within themselves to each other. The phenomena gave birth to uncertainty principle. It +is like Reactive Energy transfer in Electrical Engineering within L and C components, or as in R-L-C resonant circuit, thereby, finding actual orbital motion of orbital electron along a sinusoidal path, the respective orbit periphery as its common state, or the ground state.

2. Explanations

An excited orbiting electron emits light photons traveling at speed 'c' in space. It scientifically means that its host electron while releasing the photons is rotating around its nucleus at linear speed 'c'. But, while calculating revolving speed of an electron in its assumed orbits, they have considered mechanical laws of motion, applying gravitational forces as reactive forces to electrical field forces between protons in nucleus and electrons orbiting in their respective orbits; and electric field between electrons at radial distances from protons in nucleus, as if in free space. In doing so, they have not taken into consideration, the specific properties of electric and magnetic fields; and also, they have not remained serious enough about free space. The things will come across during developing the Relativistic Atomic Model as per the case. First, some phenomena, or behavior of electron, proton, electric field is seen in free space and inside an atom. It is seen that, one property of radial field strength variation of both, the electric field and Gravitational field, in case of field strength variation in space at the radial points away from a charge and similarly away from an object; is assumed as per inverse square law of distance. But, there is a unique difference, in behavior of electrical field and gravitational field. That is that; the gravitation field of an object, either small or big massive terrestrial one; remains always radial, either the other body is similar and even touching to the object; or, the object is stationed on the surface of the big body. But, in case of electric field; When, two unit charges are placed in free space fixed at distance 'r' from each other sufficiently near to each other; then the force in between them, does not follow the inverse square law of distance between the two; but, as the two opposite charges come more and more nearer to each other; their field lines shift from their radial nature to parallel nature, more and more; the field line of the opposite charges meeting to each other. As the distance between the charges decreases the number of field lines meeting each other increases. In an atom, the field of orbiting electrons completely engages with the field of protons in the nucleus of the atom; as discussed below.

Turning to electric force between proton in nucleus and orbital electrons and, opposing force to prevent electron from sinking into the nucleus, we see the following facts.

A concept, an original concept developed by the author, through his experience and study of EM Fields, in his handling of electrical machinery in erection to commissioning of them; every reader is requested to think

on it seriously; as the concepts are explained below. All Physicists know that, a light photon is emitted from an excited orbital electron at the speed c, the ultimate speed w.r.t. its source. But, nowhere, the process of release of photon from an excited electron is found, have been explained, practically, commensurate with the original eternal definition of energy; which is the fundamental eternal mass particles moving relatively; is the energy. It is as defined by Einstein as, 'something moving is energy' and for that something the author has added, 'the fundamental eternal mass particle, indicated in the research paper, ' The Light Photon, Dark Matter And The Whirling of Dark Matter, The Theory Of The Birth Of The Universe; published in International Journal Of Current Research (IJCR), Volume 9, Issue 09, September 2017: ISSN: 0975-333X., and other papers of the same author. Because, nobody can deny this phenomena that a mass whirling at a linear speed when released from its orbit, moves in space at its same linear speed as tat was in the orbit; and, the original eternal mass particles are the photonic particles always in different motions; of-course; all is w.r.t. an observer.

Therefore, the orbital electron should be rotating around its nucleus at the speed of light 3×10^8 m/s in its excited condition. And at other times at nearing speeds to c. Orbital electron rotating around nucleus at linear speeds of the order of 10^6 m/s and releasing light photons at speed 3×10^8 m/s. cannot be true. Because, when an object is rotating around other larger heavier object, at linear velocity say 'v'; and, is released from the object; its linear velocity in free space w.r.t. the object is 'v'. Hence, the excited electron must rotate at linear velocity 'c' w.r.t. its nucleus attached to the conman frame of nucleus and the observer. The electrical field inside an atom is assumed to follow the inverse square law for the electric field density inside an atom; and the reverse mechanical force, the centrifugal force; as the balancing or counter acting force to the electrical force. But, **when two electrical charges, opposite to each other are within their effective distances or are in hundred percent permittivity of space inside an atom; their fields, opposite to each other mutually, get engaged completely; hence, they don't follow inverse square law, inside an atom. Thus, there has remained one drawback in Bohr Rutherford Atomic model as expressed just above here.** 100 % electrical permittivity is existed; when, the medium is completely ionized or is full of electrical field/charge density. Under such medium the electric field between proton and electron rotating around it; in completely engaged between them and equals

$E = q^1.q^2$ where, q1 and q2 are opposite to each other charges.

To grasp above phenomenal equation let us refer,
$E = (q_1 q_1)/ (4\pi\varepsilon R^2)$ and,
$D = \varepsilon.E$
Where, E is electric field, D = electric flux
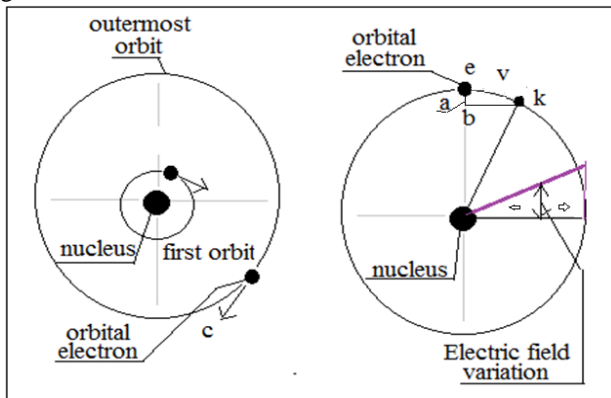Density, ε = electric permittivity of medium
Between q_1 and q_2 the electric charges opposite to each other.

When two opposite electrical charges come nearer to each other more and more in a medium ε, their more and more field lines engage with each other and within full active zone of the charges their total complete electric field gets engaged with each other; making the permittivity of the space between themselves infinite; means full, it further means unity. In mathematics to express the relations between variables infinity and zero have no meaning; 'tending to infinity and tending to zero' have value and that equal to unity describes actual behavior and the values of variables in the equation concerned. When both the charges are similar, their fields oppose each other. Therefore, the permittivity of space between the two decreases, so that, to maintain the electric field between q1, q2; the magnitude of q1 and q2 is to be increase more and more as the permittivity decreases; There from, to maintain the force between the two charges q1 and q2 opposite to each other, the field strength between the two charges is to be increased. In case both the charges are of the same sign, the permittivity between them tends to infinity because similar charges repel each other. These phenomenal behaviors are to be taken into consideration microscopically, without fail while dealing with an atom.

There is one more deficit in the Bohr Rutherford Atomic Model. It is in respect of reactive force acting against electromagnetic centripetal force, between the nucleus and the orbiting electron. Please realize that, the engine is applying a force which is pulling the car forward; but, the road is applying a reverse to the above forward engine force, to maintain the car speed constant proportional to the engine force. Both these forces here are **mechanical** and, are quite 180° opposite to each other. Here the frictional force is also a mechanical force like the car driving force. Now consider electrical field force 'E' acting in an electric conductor to give motion to free electrons and constitute a current in the conductor. When each and every free electron moves; it causes local changes in electrical field in the conductor in its effective length in forward direction. So, this microscopic change in electric field is opposed by self induced magnetic field around the path of travel of the electron through the conductor. The magnetic field direction is perpendicular to the direction of the electric force. So, the magnetic field encircles the direction of the motion of the electron instant to instant. The induced magnetic field force controls the motion of the electrons proportional to the electric force 'E' applied across the conductor through which the electric current is flowing. Now, please look; the acting force is electrical force here; and the reacting force is magnetic a different kind of force. Both are opposing each other; not at 180° in full reverse direction; but, at 90° i.e. in quadrature to each other. The magnetic field further generates mechanical momentum of the electron acting at right angle to the force between the two electrical charges. And that counts to 'm.v' or 'mc'; where v is the linear velocity of orbiting electron under the stable condition of it and, c is the linear velocity of the orbiting electron under an excited condition of the electron. The third discrepancy in Bohr Rutherford model is that, they have not considered the ultimate speed c of electron in the atomic orbits. When it is considered; we cannot use the opposing force to centripetal force between the charges as mc^2/r. where r is the radius of the concerned orbit. Because, velocity of light or any particle greater than 'c' w.r.t. its source (here the nucleus) is not existed in nature. Hence, mc^2 becomes not perceivable. Therefore, in this case instead of the centrifugal force we have to use the linear

momentum of the electron 'mc' which acts along the periphery of the orbit, changing its direction instant to instant continuously by developing the respective force, to draw the orbiting electron in its respective orbit, in the line of periphery from the tangential line to the periphery, as explained below. The fact is explained with the help of the figure-1, below.

Figure 1: Electron Momentum Opposing Electrical Force

The self induction of magnetic field by changing electrical field and changing electric field due to motion of a free electron in a conductor; is originally derived by the author in his Free-eBook, 'Special Relativity with Einstein' 2015 on Free-eBook.net and also on aca.edu web.

While searching for Coulombs formula in a doc. for reference; as usual it was observed that, excuse me; they are losing originality as usual in modern science. They are leaving it with the inventors, capturing only resultants. Again excuse me. This is not going to up level the knowledge of next generations. So, let us continue further.

At the first instant we will derive, the electrical force between the proton in nucleus and its corresponding electron in orbit around an atom.

While referring to radiations; one should keep in his mind that, when an excited electron emits radiation photons in free space around itself; the electron rotates in its orbit, in the atom at speed, c. At other times, it rotates at speeds near c.

In the figure, in an orbit, an electron e is assumed to be revolving at a speed very near to c. (it attains speed, 'c' when it is excited by an external energy source.) The electric field-force between the nucleus and the electron in an orbit is given by,

$$F = (q_1.q_2)/ (4\pi\varepsilon r^2) \text{ N, where,}$$

$(4\pi r^2)$ is the surface area of the sphere formed by the orbit in which the electron under reference is rotating around the nucleus of the atom. The formula is based on inverse square law obeyed in free space where the electrical charges at a remarkable distance. But, inside an atom the electron and its proton are very near to each other; hence, their fields opposite to each other's; engage within themselves totally. Therefore the force due to one charge doesn't act partially, according to inverse square law; but act fully. Hence, the term in above equation $(4\pi r^2)$ is replaced by unity, i.e. by 1. Because, the charge say q_1, doesn't engage partially as $(q_1/4\pi r^2)$; but it engages fully as q_1 with the opposite charge q_2 due to reasons discussed just above. Next, the absolute

electrical permittivity of the medium is ε. That of free space is ε_0. But, where in space the electric flux medium itself is an electrical field with full density of the field; then the medium is fully permitive. Therefore the constant 'ε' is also replaced by one. Thus, the force between a proton in nucleus and an electron in its orbit becomes,

$$F = q_1.q_2 \text{ N}$$

Obviously it should balance the mechanical centrifugal force (mc^2/r), which cannot be true under the facts of electric field between a proton and orbital electron, doesn't follow inverse square law but follow unity law i.e. full fields of opposite both charges are engaged completely with each other. Hence,

$$F = q_1.q_2 = k.mc.$$

The term 'mc' represents the momentum of orbital electron and 'c' there in represents acceleration of electron to attain the speed c along curvilinear orbital path of the electron as explained in figure-1 above. Hence, the proportionality constant k = 1. Hence,

$$F = q_1.q_2 = mc.$$

The force due to change in momentum at instant to instant during motion of orbiting electron is at right angles to the electric force $q_1.q_2$ and opposes it equally from prohibiting from sinking into the nucleus. This force creates a centripetal (cp) acceleration 'a' in the orbital electron. Assume the orbital electron's peripheral linear speed is equal to 'v.' So as the cp acceleration make the electron to travel an incremental distance 'eb' toward the nucleus; the linear momentum 'mv', brings the electron from its point 'b' to point k; resultantly the electron occupies the position at point k, along its orbital periphery. As the electrical centripetal acceleration in the saturated electrical field between an orbital electron and the nucleus is c; the orbital linear velocity of the electron is also c. The acceleration acting on the orbital electron is continuously and constantly acting; but, does not increasing its linear velocity; instead it is shifting its linear and tangential to orbit; velocity vector such that, it should remain always in quadrature to the radius of the orbit of the electron. Thus, it is the momentum of an orbital electron 'mv' or 'mc'; that keeps an orbital electron in its orbit, rotating; but, not allowing the electron from sinking into the nucleus.

Spatiality of Momentum of Microscopic Particles: It will be better to explain the fact; why the electron momentum is not given as (1/2).mv or (1/2).mc and it is given as 'mv' or 'mc'; because the electron catches an acceleration from zero to 'c' within an instant and at its velocity it becomes zero. Further time required for obtaining speed c from zero; the distance travelled is (1/c). It means in one femto second or so; electron will travel the distances a femto-meter or so. Hence as the radiation space speeds are 'c'; the orbital electron speed of an electron in any orbit is near 'c'. When it attains the speed c in any orbit; due to external excitation; and if it given energy further more; it emits that energy as light photons to release the extra energy fed to it; to maintain its stability.

As seen above the momentum of electron is same in each orbit; the momentum develop centrifugal force equal to $(mv^2)/r$. Bt, as here v=c; the force is (mc^2/r), limiting condition just before over excitation. Because, energy after

the electron achieves speed, 'c' its speed cannot increase beyond c because of natural perception limit. And then the electron gets overexcited at speed, 'c'. Therefore it ejects the extra energy within a while as light radiation. Thus, at speed 'c', the centrifugal force is (mc^2/r) and under stable condition it is equal to the electrical force; to the different kind of force the electrical force. As stated by the author above, when the force assisting an entity is of the same kind that of the entity; then, the both forced, one original and the other reactive force, act in reverse direction to each other; that in 180^0 direction w.r.t. each other. And when the force developed by the entity, is of different nature/different kind of the original force of the entity; then, the developed force which help the entity to maintain its present state; acts at 90^0 to the original force. Therefore; in case of an orbiting electron, the original force is electrical force and to oppose the force to make change in revolving state of the electron; opposing reaction is produced by the mechanical momentum of the orbital electron. Each of the all electrons in its orbit is capable to emit light photons. And the light photons travel at speed near c with small differences in their space speeds in free space. With these facts, let us see how each orbital electron rotates the conman nucleus at speed 'c'. Please look the figure-1, below.

In the figure, in an orbit, an electron e is assumed to be revolving at a speed very near to c. (it attains speed 'c' when it is excited by an external energy source.) The electric field-force between the nucleus and the electron in an orbit is given by,
$$F= (q_1.q_2)/ (4\pi\varepsilon r^2) \text{ N}$$

This force creates a centripetal (cp) acceleration 'a' in the orbital electron. Assume the orbital electron's peripheral linear speed is equal to 'v.' So as the cp acceleration make the electron to travel an incremental distance 'bk' toward the nucleus; the linear momentum 'mv', brings the electron from its point 'e' to point b; resultantly the electron occupies the position at point 'k', along its orbital periphery. As the electrical centripetal acceleration in the saturated electrical field between an orbital electron and the nucleus is c; the orbital linear velocity of the electron is also c. The acceleration acting on the orbital electron is continuously and constantly acting; but, does not increasing its linear velocity; instead it is shifting its velocity vector such that, it should remain always in quadrature to the radius of the orbit of the electron. Thus, it is the momentum of an orbital electron 'mv' that keeps an orbital electron in its orbit rotating; not allowing the electron from sinking into the nucleus.

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$$F= (q_1.q_2)/ (4\pi\varepsilon r^2) \text{ N, where,}$$

($4\pi r^2$) is the surface area of the sphere formed by the orbit in which the electron under reference is rotating around the nucleus of the atom. The formula is based on inverse square law obeyed in free space where the electrical charges at a remarkable distance. But, inside an atom the electron and its proton are very near to each other; hence, their fields opposite to each other's; engage within themselves totally. Therefore the force due to one charge doesn't act partially, according to inverse square law; but act fully. Hence, the term in above equation ($4\pi r^2$) is replaced by unity, i.e. by 1. Because, the charge say q_1, doesn't engage partially as ($q_1/4\pi r^2$); but it engages fully as q_1 with the opposite charge q_2 due to reasons discussed just above. Next, the absolute electrical permittivity of the medium is ε. That of free space is ε_0. But, where in space the electric flux medium itself is an electrical field with full density of the field; then the medium is fully permissive. Therefore the constant 'ε' is also replaced by one. Thus, the force between a proton in nucleus and an electron in its orbit becomes,
$$F = q_1.q_2 \text{ N}$$

Obviously it should balance the mechanical centrifugal force (mc^2/r), which cannot be true under the facts of electric field between a proton and orbital electron, doesn't follow inverse square law but follow unity law i.e. full fields of opposite both charges are engaged completely with each other. Hence,
$$F = q_1.q_2 = k.mc.$$

The term 'mc' represents the momentum of orbital electron and 'c' there in represents acceleration of electron to attain the speed c along curvilinear orbital path of the electron as explained in figure-1 above. Hence, the proportionality constant k = 1. Hence,
$$F = q_1.q_2 = mc.$$
$$F= (q_1.q_2)/ (4\pi\varepsilon r^2) \text{ N}$$

In above relation the force decreases in inverse proportion of square of the distance between the two charges. The charges exert their forces on each other by means of their electrical field which rarify at far, as per inverse square law of distance from the charge. The law follows is, the electric field emanate from its source charge, in radial direction to the charge, from the center of the charge, up to infinity in free space. Similar charges repel each other; so also, similar field lines repel each other. But, when two field lines, one from negative charge and other from positive charge, unite with each other; then, these field lines, opposite to each

other, forming one single line, does not react with neighboring field lines; as if it has become neutral. Therefore, other neighboring field lines, one from negative charge and the other from +ve charge, shift towards the engaged conman field line formed above. In this fashion, as the charges are brought nearer to each other, more and more field lines, between the opposite charges unite with each other; and resultantly, at a specific distance, all field lines of negative charge, electron and the positive charge, the proton, both resting in free space, unite with each other, forming space between the proton and electron completely electrified space; that's the space filled with electric field. It occurs at the distance equal to first stable orbit of hydrogen atom. In other heavier atoms the nuclei of atoms are larger and larger. Therefore, the first orbital two numbers of electrons maintain, their distance from the nucleus surface, suitable to occupy the sphere of first orbit by the first two orbital electrons. On this basis; how the relation, of number of electrons in an orbit equals to $2n^2$, where n is the orbit number given from nucleus outwards; is existed is explained below, originally by this author. Let us take a hydrogen atom. Its single electron orbits in first orbit maintaining radial distance r_h from its nucleus, where at single proton is existed. The electron charge occupies whole space around the proton, resting at the center of sphere of the electron charge cloud. So, the volume of the sphere formed by the orbital circle, of the electron in a hydrogen atom is,

$$(4/3).\pi r_h^3. \underline{\hspace{3cm}} (1)$$

The second orbit has radius equal to $2r_h$, the third orbit has the radius $3r_h$, and so on. The proton in nucleus of hydrogen atom is assumed to occupy a point at the center of the orbit. Therefore, volume of 2_{nd} orbital sphere works out, equal to,
$$(4/3). \pi. (2r_h)^3 = (4/3).\pi.8.r_h^3,$$

Dividing the volume of 2nd orbital sphere by the volume of first orbital sphere of hydrogen atom; we get,
$$[(4/3).\pi.8.r_h^3]/ [(4/3).\pi r_h^3] = 8.$$

And '8' is the number of electrons that are or can occupy second orbit. Similarly, electrons in third orbit are 18 and so on, according to above concept. And this calculation gives the number of electrons in an atomic orbit equal to $(2n^2)$. Not any other atomic model answers the question, why the number of electrons in an atom, are as per expression $(2n^2)$.

Now look please, every orbital electron in an atom, occupy the volume $(4/3).\pi r_h^3$, within an atom, from respective orbital's surface to the nucleus of the atom. Therefore, the electron charge field density increases from the surface of an atom towards its center.

Now, let us see, the field distribution due to positive electric charge concentrated in the nucleus in an atom. Its positive electric field will be denser around it raring radial towards the outer surface of the atom. It coincides with the field distribution of electros in orbits. The electric field of orbital electrons all ending in nucleus of the atom, and are concentrated in the protons in nucleus.

It is true that electron shells can hold 2,8,18, 32, 50, …electrons. While 2, 8, 18,32,50, ….. are each wice a

quadratic number $(1, 4, 9, 16, 25,….n^2)$. It is natural as the author above; it is the cause of particular volume an electron occupies in its any of the orbit.

It is the maximum occupancy of two electrons in the first the smallest orbit which leads to the nice quadratic sequence; so that each shell numbering (1, 2, 3, 4, …, n) can hold (2, 8, 18, 32,…$2n^2$) electrons.

Now, consider nucleus instead of a point with number of protons as per the atomic number of the atom; definitely the nucleus will not be a point nucleus; but will have certain radius. The, all orbital diameters will be increased by additional amount of the nucleus radius. It does not affect the electric field value and distribution of the field between the orbiting electron and the nucleus.

The energy of an electron in n^{th} orbit is given by,
$E_n = -hcR_{infinity} [Z^2/n^2]$,.
Approach towards exactness of energy of an orbital is made by substituting. $Z_{effective,}$ the
Effective nuclear charge is, the net positive charge experienced by an electron in a poly-electronic atom.

Where, $R_{infinity}$ is Rydberg Constant. h is Plank's constant and E_n is energy of an orbital. The -ve sign indicates the energy gradient is assumed or accounted from the center of the nucleus, radial towards the outermost shell. The square of the ration [Z/n] indicates that, the electric field inside an atom also, follow inverse square law. And third assumption seen in above relation is, orbital electrons have different speeds on the law of speed followed for orbiting planets around the Sun. As per the perception of author; all three concepts considered in above equation are incorrect.

In preset Rutherford Bohr model or any other recent model as per quantum mechanics; though inverse square law of field is followed in atomic space inside atom, resultantly each of the orbital can get their equal and opposite field from the nucleus; but, it affects the results, may it be very seriously, as is seen ahead in this paper.

One major difference between this Relativistic model and, Rutherford Bohr model with application of quantum theory; is that, inside an atom, electric field doesn't follow inverse square law. Instead, the field of electron and a proton are established between them engaging each other completely, as mentioned above.

Please be very cautious. In relativity, when the source moves with some relative speed 'v' then, the speed of light doesn't become, $(c + v)$ or $(c- v)$ but, decrease to $(c^2 - v^2)^{1/2}$ in both of the cases; where c is speed of light and v is the speed of the source w.r.t. the observer as proved in An Innovative Review of Kennedy-Thorndike Experiment; published in Scientific Research Journal (SCIRJ), Volume V, Issue V, May 2017: ISSN 2201-2796: Free access.
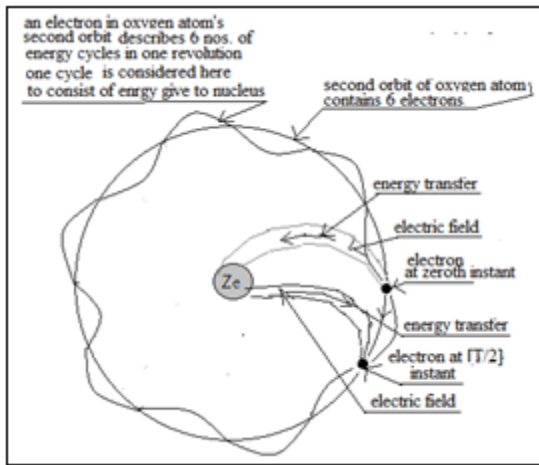
There is limiting value of field in free space that is its saturation value in the respective medium. So in saturated field space, an electrical charge electron cannot show its effect to full extent. It can act to the extend up to which the saturation is weak; that is by which amount, the field

saturation is less. If the field is as dense as that in the inside of the electron; the electron field cannot add to the field; an electron just floats as a particle as if not having a field. The field in sky, in the first two orbits is near saturation. In this condition of the field becoming more and more dense and approaching nearer and nearer the saturation towards the nucleus and saturates in first and second orbit, makes the first and second orbital electrons just to float in saturated field. It feels very small attraction from the nucleus. The electric field acts fully on the outermost orbit also; because, it is fully engaged between the nucleus and an orbital electron'. But, the effective field density in space inside of atom, towards outermost orbit, goes on decreasing. The orbital electrons are saved from sinking into nucleus of the atom by their orbiting momentum. There is very difference between action of centrifugal force and the linear momentum capable to develop a linear force. For, the reactive force to 'central attractive force' in a solar-like system, when it is centrifugal force is depended upon centrifugal acceleration (v^2/r) where as in case of orbital linear motion; it is dependent only on the linear velocity. In case, in the solar-like system, when the force on orbital objects is not varying as per inverse square law; instead it is remaining constant, not varying its distance from the center 'r'; then, one should not use, centrifugal force there as the reactive force. There he should use the momentum as opposition entity to maintain the orbital position i.e., the orbital radius constant of the object. Hence, in an atom for orbital speed; excuse me, the science has been being using centrifugal force of orbital electron to find its speed in its orbit, and carry virtual results. Only one fact makes clear that error of applying inverse square law to electrical forces inside an atom; that is, How an orbital moving at speed about 10^6, or nearing it; which is very less than light speed 'c' w.r.t.; the nucleus of the atom; can eject a light photon at speed of light 'c'. Then they may say light photon is a virtual particle. How they can say that, when, light can offer a momentum to a mass and light also exhibit a mass and gravity. Then they may say, light cannot be speeded up beyond speed c. Please see how it can happen. Because, 'the dark/black photonic fundamental, eternal photonic particles are the real source of momentum transmission; and when, in the same frame nothing can move at speed greater than 'c' and that, for transfer of momentum to a particle already moving at speed 'c' as light; the particles to rage its speed/momentum must be released from its source at a speed at least a bit higher speed than 'c'. Excuse me, only stating something virtual doesn't work true. Thus, we are carrying mistakes and mistakes in Modern Science and doing further inventions. In this situation we might be carrying a constant mistake in our further inventions. Here in this paper, author has taken rid off the inverse square law of distance; and has rightly used the opposing entity the momentum to calculate the speed of orbital electron. The author has discussed that, an electrical charge occupies certain space volume inside an atom irrespective of its orbit number or its quantum number. The second fact is that a charge's field is spread from its orbit to its nucleus. Hence, the electrical field inside an atom varies, as per Inverse Square of orbit number, being maximum at outside of nucleus or at first orbit and minimum at the outermost orbit. Field's maximum value is the field at the center of an electron. In the heaviest atom in the universe, this condition

is definitely existed; beyond that atom no atom can be present in the universe and, not any atom can be created to exist more than a while. So in such condition it is difficult to compute position of the electron in that first or second orbit of the heaviest atom. Therefore electromagnetic force acting on firs orbital electron is very small. Therefore, they revolve at the slowest speed of other orbital electrons; totally opposite result that to the now existing concept. But with pure logic it is very true and practical. As the field density is lowering in outer orbits, the orbital speeds will be increasing to oppose the nucleus force on the orbital electrons.

The two differing concepts, one the reverse action and the second is, an opposing action to maintain the present state of an entity by the entity itself. The reverse action develops force of same quality of the acting agent; e.g., To oppose a pulling force, reverse force of friction in case of a vehicle or a tensile force in case of a wire rope, reverse induced e.m.f. in case of increasing acting e.m.f., reverse gravitational force due to total mass in cosmos to the black hole force at its horizon, acting upon mass particles; these are the examples of reverse reaction. Now about opposing reaction; in opposing reaction the acting force is of one type but, the opposing force to maintain the present state of the entity the same the force is of different nature; e.g., an increasing electric force, develops magnetic force to counter balance it, in the direction, perpendicular to it so as to oppose the increase of the electric force. All these reverse and opposing forces react to maintain the varying quantity of the agency as at presently existing then. Therefore, to move the agency external additional force application is required to overcome the reverse and opposing quantities as per the case. Therefore, in doing work energy is to be utilized. In doing work energy is not consumed at all. Only thing what happens is the energy changes its form in doing work. This statement seems simple but, reveals a window to peep into the spiritual world. How? Please look! In spirituality a person can shift from one place to many light hours away within a shortest instant. That must be by the above mentioned way over here by a process unknown to us.

Now, please see, the orbital radii are different and each electron speed is c in its orbit; and that the electric and its associated magnetic fields are bound to interfere/cross with/to each other every now and then; internal energy transfers take place; and all orbital electrons are bound to oscillate between their sub-orbits defining a sinusoidal motions along their orbital periphery, as shown in the figure-2 below.
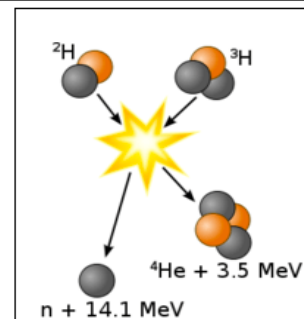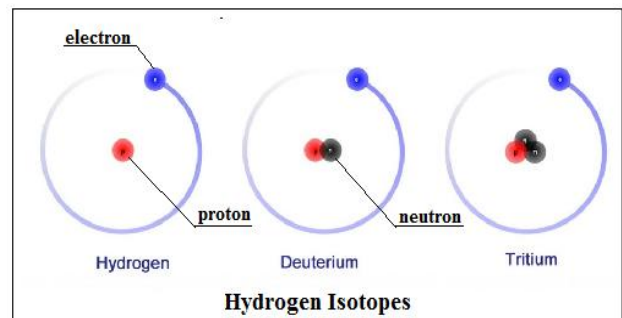
Figure 2: Orbital electron vibrating along its periphery [From, Field Mode and Photon Mode of E.M. Energy Transfer through Free Space; Published in IJCR, Volume 9, Issue 12, December 2017.]
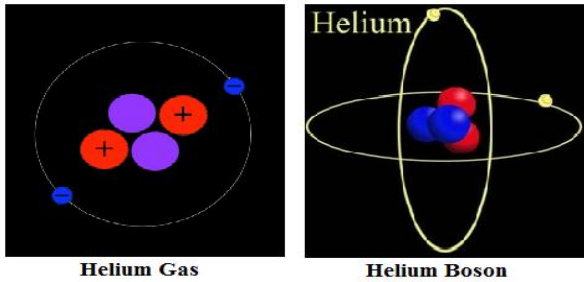
Above Fig.-2 exhibits the uncertainty principle also. In-fact, the cause of birth of the uncertainty principle in orbital motions of an electron lies in the interference of electric total field of each orbital electron with other orbital electrons mutually. Because, electrical field and its associated magnetic field of each orbiting electron is completely engaged with the nucleus of the atom; and, during rotation of orbiting electron, around its nucleus, its EM Field interferes with the EM Fields of the inner orbiting electrons. As the linear speed of these all electrons in different orbits, is nearing to 'c', the EM Field of each orbital electrons is disturbed by the field of each of the other orbital electron each time when the fields of the both cross each other in their orbital motion. Thus, the EM Field of the outermost and the innermost orbits are disturbed more times than electrons in other orbits, the most probably. By observing the figure-2 above, *it is very clearly obvious. In an excited atom, each wave on orbit corresponds to release of a photon containing a pair of polar photons oriented with respect to each other by 90°. The motions and the acts of an electron in an orbital, all are with respect to the nucleus of the respective atom.*

As the number of electrons and protons in an atom is equal to each other; their EM Fields are engaged in pairs. Therefore, the EM force acing on each orbiting electron is equal to $[-q^2]$ N. irrespective of its orbit number. Hence, each mutual disturbance between orbiting electrons in different orbits causes release of extra energy of the electron, in the form of series of photons having energy equal to 'h' fundamentally per packet of energy. Such 'n' number of packets released per second gives the frequency of that radiation. Further such n_1 number of packets of energy 'h' the Plank's constant gives the intensity of the respective radiation, received from external source for excitation of the atom. The light is formed of these photonic particles. Its speed is 'c' w.r.t. its nucleus. Hence kinematic-ally, the linear speed of rotation of an orbiting electron around its nucleus is/must be 'c' under excited condition. While releasing a photon in space, therefore, some small part of the field of the excited electron must have to swing in space while releasing the photon. These field swings can give radio photo of billions of light years away celestial bodies immediately. A

fundamental photon contains to polar particles and that photon is associated with its anti photon; when seen in wave form, the photon is considered as positive half of the wave and the anti-photon are considered as negative part of the wave.

To every particle there is antiparticle of its reverse characteristics. Any type of every property, have anti-property an opposing property to it. To any principle there is always an opposing principle. To a moving force either there is frictional force or any other type of reverse force or opposing force, generated from the original acting force. So, to move, to bring a change in position here in this case, energy is to be provided. That energy does the work. Now see the beauty of the nature, the energy spent in doing a work is not exhausted, in the sense, gone, from the universe, but, it is stored in another form of energy maintaining its quantum the same as before. Thus, transformation of energy from one form to other form does work. Thus, energy is eternal. Something moving; the fundamental photonic particles moving is energy in the universe called the Dark Energy. Many think a wave nature as something virtual, illusive existence. Nothing is like that. The periodic distribution in equal number of photons each say 'nh' of fundamental moving mass particles each of mass $[h/c^2]$ kg., along a line. In fact, the definition of a photon an energy packet is very wide. A fundamental photonic mass h/c^2 kg moving at speed 'c', exhibiting energy 'h' is the smallest energy packet. On the other hand the collision of whatever the biggest black holes or the galaxies when collide and emit energy; that total energy is also a photon. But, the smallest possible photon, the energy packet is the fundamental light single photon 'h' which is Plank's constant. Now we will visualize, the union of a proton.

Hydrogen Isotopes

Figure 3: Fusion of deuterium with tritium creating helium-4.

Now we will visualize, the union of a proton and an electron giving **17.59 MeV of energy and a neutron** in union of deuterium and tritium.

Please see above fusion reaction. When, deuterium and tritium unite. Peering through the reaction, we can observe that, Fusion of deuterium with tritium creating helium-4, freeing a neutron, and releasing 17.59 MeV as kinetic energy of the products while a corresponding amount of mass disappears, in agreement with *kinetic E = Δmc²*, where Δm is the decrease in the total rest mass of particles. Further explanation is added as follows.

In deuterium there are two hydrogen atoms. One hydrogen atom can accommodate two numbers of electrons in its first orbit, with two neutrons in its nucleus. Or, one electron of each hydrogen atom in deuterium can share the orbit of the other atom of hydrogen atom there in. In tritium there is one more hydrogen atom as compared with deuterium. The orbiting electron of this third hydrogen atom becomes rather free and shares the orbits of two hydrogen atoms when they are empty. That free electron in tritium posses total energy the internal binding energy in quarks and its external to it, energy due to its orbital motion, equal to 14.1 MeV. When deuterium fuses with tritium, the free electron finds no place in the combination and gets out of atomic structure; releasing as free electron. The free electron releases its energy 14.1 MeV minus the kinetic energy of the freed one neutron. The kinetic energy of one neutron is logically assumed equal to [3.5/4 = approximately =] 0.9MeV Thus, total energy of electron equaling to 13.2 MeV (Please refer above figure-3). Now, with reference to, ' Length Contraction, Time Dilation, Gravity, Total Existence of Universe and Beyond; Published in IJCR: Volume,9; Issue 11, Nov. 2017: : ISSN:0975-333X.' and, ' An Innovative Review of Kennedy-Thorndike Experiment; published in Scientific Research Journal (SCIRJ), Volume V, Issue V, May 2017: ISSN 2201-2796: Free access.', We are going to reveal How we are observing energy 14.1 MeV with the one free neutron released in the above fusion process of deuterium with tritium.

In above fusion process one number of electron from one hydrogen atom is lost and from the fusion of deuterium and tritium, creating Helium-4, converting one electron completely into radiation energy and freeing one neutron from tritium; because, that one is loosely bonded in tritium atom. [Now, please see below math's calculations. Please see the maths below.
Rest mass of electron=9.109x10⁻³¹ kg.

An excited electron in an atomic orbit, eject a light photon fundamental masses at speed of light; hence, the excited respective electron is rotating around its nucleus at linear speed 'c'. Therefore the energy with the electron w.r.t. its nucleus is,
9.109x10⁻³¹x (3x10⁸)² = 81.981x10⁻¹⁵ Nm]

In above process one electron is completely converted into radiant energy. Actually its orbiting kinetic energy plus the binding energy of fundamental photonic particles of all the quarks in the electron is converted into energy in motion of each photonic particle to speed 'c'; plus, the binding energy of the freed neutron plus the energy of being separate one proton from tritium and plus the binding energy of deuterium; all these total energies equal to 17.6 MeV are transformed into radiant energy in formation of ⁴He. **This phenomenon indicates that; what electrical charge is. It is relative perception by an observer, of the fundamental, eternal field of attraction. All the fields, the gravitational, electrical, magnetic, cosmic, atomic strong and weak fields, all have differing properties from each other; because of the type of motion of the particle and state of particle in respect of its motion.** It is being explained as below.

Attraction is the fundamental force in the universe. In order to exist the universe, dual of each property is existed in the universe kept separated by natural force exerted by Dark Energy beyond the universe all around it up to infinite distances. Therefore, the counterparts are kept pulled apart from each other at a distance from each other greater than effective distance. The effective distance is defined by the author as the distance between two opposite or similar particles; when come nearer to each other within their effective distance of any one of the two and/or within both of them; the attractive force between them becomes much greater than the universal and its beyond, attraction force acting the two particles opposite to one another. Due to adding one side attractive force by scientific means or anyhow, separation of those particles takes place and when observer keeps his concern with those particles only; he defines it as Repulsive force. In these nano-processes, **the forces acting on photonic fundamental masses are of the order of thousands of Newton. And it is not possible without the existence of Dark Energy, its fundamental inertial particles to contain the energy called the photonic particles and their any motion at linear ultimate speeds and their existence in all directions within and beyond up to infinite distances all around the universe.** When these particles whirl around each other they form purely Dark Energy. when these particles move ate speed of light w.r.t. an observer, they form the light, When these particles get excited to increase their speeds beyond 'c' w.r.t. each observer some unknown link between an observer and the photonic mass increases its force to pull the photon not to allow its speed beyond 'c' because, beyond that the link becomes fatigue and loose its property. It makes it to disappear. For visual existence of anything means anything in universe; three properties are the must be properties; those are Mass, motion and its field. This factual behavior of fundamental photonic mass particles leads to the fact that a field has also existence of elastic virtual material; its thin thread transparent to all, even to mass also, connects tech fundamental mass to each and every fundamental particles in

the hole cosmos (the author include all beyond the universe in cosmos.) Up to speed 'c' of the photonic particle the pull on the gluon thread gives an observer the feel of gravitation. The energy fed to the particle, after achieving speed 'c' by the particle it creates, additional attractive forces between the observed particle and other particles in universe coming under influence of the referred particle. Those are differentiated by name electromagnetic forces. Due to it, the energy to increase speed of the particle under consideration; is transferred other similar particles in the effective zone of the considered particle for our discussion. When energy is evacuated by the source assumed stationary; from the photonic particle in speed 'c' moving away from the observer; the particle stops first and then moves towards observer at speed 'c'. If the evacuation is continued the particle speed is not increased; instead additional pull is increase, but not increasing velocity of approach of the particle towards the observer; instead the energy is transferred to other particles in universe electromagnetically. So, so electromagnetism is the phenomena, that takes place when the negative attraction force between two particles due to Dark Energy is tried to change beyond speed of perception 'c' for an observer by feeding energy to the particles by the observer attached to a particle considered stationary; the other particle transfers that extra energy to other particles near around it in succession. Those energy transferring links are electromagnetic but working similar to original link to affect the attractive force mutually. The fundamental particles in linear motion at speed 'c' create electrical current and its associated magnetic field. But, when this action takes place in respect of photonic particles spinning around themselves, that particles extra field acts locally and it is said static electric field. Its magnetic field is limited to within itself only. Rotating speed, whose tangential speed component is 'c', has another centripetal speed component due to spinning around itself. It cannot increase the spinning speed beyond 'c'; hence, that spinning component gives rise to peripheral speed equal to 'c' maximum. Therefore, the additional speed component creates the polar magnetic field around the particle and the spinning particle constitutes charge flow exhibiting equatorial current. Thus, the particle itself, represent only electrical charge. And the group of such particles forms static electricity/ the static electric charge.

Thus, each force existed in the universe is the force of attraction; and, its different manifestations according to its specific action; they are named differently. The force of attraction is the original fundamental, eternal meaning by, ever existed force and its field which can be varied according to respective different field; is in fact unified field. And gravitational attraction of the Dark Energy all over and beyond the universe is the unified field theory. Work in respect of this line can only give unified field theory. Let us try.

All fundamental quantities in nature, in universe, in the whole cosmos are eternal, existing when the materialistic universe may or may not be existing; when, a feel is existed about these fundamental quantities by themselves physically like some specific physical properties; that's the almighty the God, The Brahma. In physics we see it with the help of materialistic instruments where as in spirituality, we see it

with the help of mind, intellect by perceiving the concerned facts pure logically and logic is also a science. In fact spirituality is very microscopic science. Viewing it macroscopically has separated the modern sciences from hem. Now again the modern science can view it with its virtual materialistic microscopic view; both the spirituality and the sciences will found no bounds like beyond the universe.

All forces except, the force of gravity have each of them reverse force. Hence, it seems that, the gravitational force is the fundamental force and the electric force, with its associated magnetic force are, its associated forces.
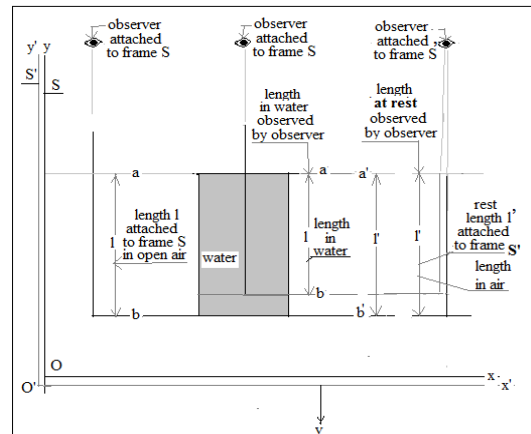

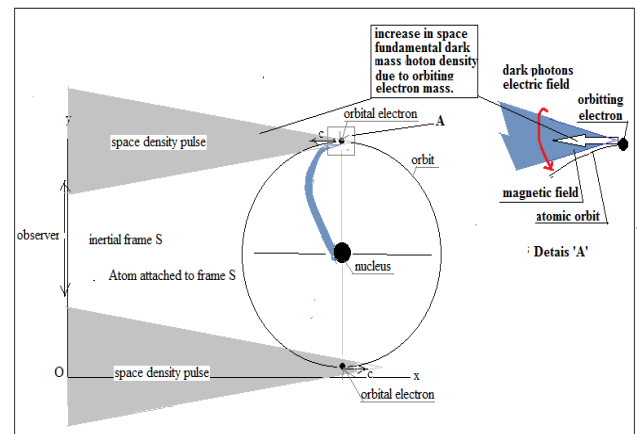**Figure 4:** Length contraction Due to Refraction

Figure 5: Mass in Speed 'c' Make Dense, Dark Energy Release Electric Charge with Magnetic Field

As per Special Relativity principles, and the notations, the rest length l' moving at linear constant speed v, along the sight of vision of the observer O; w.r.t. the observer O assumed stationary, is seen equal to l ; so that,

$$l = l'. \ (1 - v^2/c^2)^{1/2} \ \ldots\ldots\ldots\ldots \ (2)$$

In refraction of light also, the length contraction takes place in denser medium. In practice, the science has decided, water density unity and on that base, relative densities of other materials are decided. But, for the time being, we assume, the density of fluid air unity as a base. Therefore, the density of water will now, we will consider higher than one and denote it as ρ. Please look, in relativity length contraction is due to speed and in refraction of light, the length contraction is due to density of the medium through

which the light signals informing the length, travel. In relativity, the observer is assumed stationary and observing moving length; whereas, in refraction observer is assumes, observing the length in denser medium from rarer medium, the air, the normal medium. In both cases the observer sees length contraction. In these both cases the length contraction is not real; but, it is seen. In these both cases, the length contraction is apparent. In relativity the length contraction is due to **speed**; whereas, in refraction, the length contraction is due to (higher) density. Hence, in comparative study of those both length contractions under different phenomena; we can truly assume **velocity in relativity proportional to the density.** Therefore, an orbiting electron in figure 5 above produces mass density in free space in its direction of motion. Nature maintains itself always **'nothing'** by itself. Due to the push of the orbiting electron at speed c the Dark Photons (Dark Energy Particles) omit electric charge fine material and wears it; thereby, establishes changing electric and magnetic field in space. The electric material originally is of negative charge as per our allotted convention. Similar charges repel each other, hence the Dark Photons densely collected in front of the moving electron, move away from the effective zone of the orbiting electron. Moving electric charge is associated with magnetic field; and that magnetic field opposes the motion of the mass particles which have worn the charge. The magnetic field energy controls the Dark Photon masses to maintain the average space density as the orbiting electron passes away.

All moving terrestrial masses under normal state of them in universe produce gravitational waves. But, they are like our normal electric supply. They all in universe form the gravitational universal constant, the Big G. And during abrupt condition like collisions of stars, galaxies etc. the gravitational waves behave like impulse voltages, high voltage harmonics under fault condition. Thus, cause of all is the Dark Photons which posses the trio of mass, energy and gluon. It has gravity as said above. It has mass equal to h/c^2 as derived from Einstein's mass energy ~~conversion~~ transformation formula [$E=mc^2$] and Plank's Black Body Radiation formula [$E=hv$]. It has mass, electrics and gluons. When we found with quarks that, fractional electrical charges can exist; that time only it was inherently proved that the particles, the very basic particles from which the quarks-gluon soup is made, and light is generated from an excited atom and therein excited electron, and that, something moving is energy; is definition of energy, and that, That something which is not directly observable; and hence, it is called something by Einstein during he defined energy as above; and that, Whole universe is made from it; and that, it must exist beyond universe in whole cosmos (by the word cosmos I mean, the whole universe and its beyond whatever may be existing non-existing. Its mass is 7.3×10^{-51} kg. As calculated from above formulae. Every particle in 'standard model of elementary particles' decays but, these Dark Energy Particles does not decay at all. Each of these particles contains the very basic fundamental eight elements of the cosmos; having existence of each in the eternal three forms, as explained below.

1) Mass: As given above each particle (Dark Photon) has mass equal to 7.3×10^{-51} kg.; and, have length and breadth of the order of 10^{-51} approximately and thickness tending to zero. Its shape is like annular surface of a sphere.

2) Property of water: the dark photons in cosmos flow down the gravitation gradient in the cosmos. Outside the universe, the Dark Energy is spread all around the universe at infinite distances in all directions. Its gravity is much high. Hence the Dark Photons forming Dark Energy are moving towards high gravity along with its constructed terrestrial objects. Hence, the universe is expanding at accelerated rate. The Dark Energy is like a fluid filled up fully in the no ending cosmos. (Cosmos as defined above). As rivers go to sea; the universe's objects go to beyond universe.

3) Light, the Radiations: All elementary particles are made up of Dark Photons. We could not separate out quarks from 'quark gluon soup' at CERN; but, in nuclear reaction, the quarks of lost electron in the reaction break into, up to dark photons delivering all its energy to the energy absorbents arranged and the photons remain whirling in space wherever their energy in motion is exhausted; now have energy due to their position in cosmos w.r.t. all infinite number of dark photons in the universe.

4) Air or gas: Dark Photons have property of air or gasses. These properties like solid, liquid, gas are dependent on temperature. Temperature is nothing that, a measure of internal motions of an object. So, in the Dark Photon Form the Dark matter have these three stages within zero degree K to 2.15 K. In universe we feel it in gaseous form. In BEC it is seen in both forms liquid and solid form. When it is packed caught in the crystal, it is solid; and when it cycles in Bose Einstein Condensed it is liquid.

5) Sky: The Dark Photons do not obstruct any. This is the property of sky with them. Sky can be perceived but cannot be detected. Dark Photons can be perceived by 'Gravitational Lensing' but, cannot be detected.

6) Mind: The mind is interactions locked, being locked in brain nerves. Brain, the brain nerves all is the product of these Dark Photons. Further, the Dark Photons spread in universe also behave as per physics' laws. The physical laws make the river to flow towards sea. The physical law/feeling makes a student to go to school. Same way, the gravity acting from outside of universe, makes the dark photons and their produces to expand the universe to merge in infinite Dark Energy. It is the Universe's mind.

7) Intellect: As mind receives effects, the intellect thinks on those effects like 'mathematical unit' of a computer. All think as per natural laws. When during expansion of universe an object receives speed of many, c, then' the electrons in its atom cannot revolve around their nuclei. Hence, the Dark Photons free themselves from the elementary material totally and find their position in Dark Energy outside the universe.

8) Conscious: The act of mind and the intellect represents conscious. In the universe nothing means nothing, takes place beyond physical rules. These rules are obeyed by the universe in the cosmos invariably, strictly, without fail. That shows the conscious of the universe. The lat important fact is that, there are fundamental basic rules. Laws and behaves of the cosmos; whose origin cannot be found. And that is the stage where Supreme Power of whole cosmos and human entity which is continuously had been being hunting for it appears scientifically. The

fixed laws of nature which are very fundamental ones are the laws determining the universe's functioning; like Govt., GRs. In Spirituality it is called the reign of the God, *in Vedas, 'Eeshwari Satta'* . And the Supreme Power works through the Dark Energy made up of moving dark photons. ***Hence, placing the 'Dark Photon' and 'The Ganapati', the Idol of whole cosmos representing from the Dark Photon to existing total universe will complete the "Standard Model of Elementary Particles".***

The light generation from an excited electron, confirms the excited speed of electron in its orbit to be c+ .The question of why ultimate speed 'c' come into existence? And how electric property to restrict a speed change at ultimate speed, leads to confirm that? Dark Photons do have electric charge; under speeds less than c, it doesn't act, but at speed just incremental speed tending to cross the ultimate speed the charge appears out of the dark photon creating associated magnetic field of the electric charge, opposing the speed rise and maintaining the photon speed limited to 'c' w.r.t. its source atom or source electron. In BEC the light photons ride on orbiting electrons at cycling speed and as the electrons come in line of motion of the light photon, the light photons just slip away and fly out at light speed. This indicates that the gluons act as spring attached to light photon in front of it. When the photon is obstructed, it sticks to obstruction pressing the gluon spring; as the ghost atom of BEC rotate at cycling speed, the photon slips along the fin or wall formed by orbital electrons of the BEC ghost atom; and soon the photon comes in line of its previous travel; it just slips from the Atom and fly away at speed of light, releasing the spring. It doesn't rebound from there; because, it exerts always forward force; one of the property of Dark Photon of Dark Matter got revealed thus, here. In formation of matter these gluon springs get skewed between each other forming Quarks and other not skewed remain sticking to quarks to form quark gluon soup. **So by giving certain orientation to the quarks in the soup, the quarks can be separated from quark gluon soup. From BEC we can learn that, angular speed orientation given suitably to the Quarks can slip out the quarks from the liquid of the soup.**

3. Conclusions

In an atom, inside of it, the electric field of each revolving electron and that of respective proton in the nucleus, at the center of the atom are, completely engaged with each other and the field of each electron and proton, revolves with the respective electron around the nucleus.

The electric field and its associated magnetic field, entangle with each other, during their rotation and cause, internal energy oscillations between orbits like L-C circuit in electrics. If external energy is fed to the atom, these oscillations give out that extra energy out in space around the atom in the form of radiations. The atomic internal circuit works then as R-L-C circuit in electrics.

An orbiting electron has a specific annular surface area of sphere formed by the orbit. That controls the number of electrons in each orbit as it to be equal to $2n^2$ where n is the orbit number.

Under normal stable conditions, an orbiting electron rotates around the nucleus at linear speed of the order of 10^6 m/s., but, when it is excited by external energy, it reaches to light speed ejecting out the extra energy in the form of light radiations. Light is emitted from excited electron at speed 'c'; hence, the respective electron emitting light; must revolve around its nucleus at speed 'c'.

Inside an atom, complete electromagnetic field in between orbiting electrons and the protons in the nucleus, is packed totally inside of an atom. Therefore, the electric permittivity and magnetic permeability inside an atom is unity.

The electromagnetic field inside an atom is very dense at the surface of the nucleus and rarifies radial to atomic center, as per inverse square law.

In nuclear reaction, an electron is lost in conversion of its total mass in to fundamental Dark Photons moving at speed 'c' transforming the total internal energy of an atom into energy. Moving mass is energy. Energy and mass cannot be separated from each other as the magnetic south and north poles can never be separated from each other. Even wave nature of energy is formed from light particles/photons. Bundles of fundamental mass particles, each having mass h/c^2 collected together in the form of end to end section of coconut, having thickness tending to zero; such two sections connected to each other tail to head, form light photon with polar nature. This h/c^2 mass is of fundamental each mass particle. They all fundamental masses are eternal. They form the 68% of Dark Energy of the universe; and total energy beyond the universe.

All forces in the universe are attractive forces and its respective repulsive forces except the gravity. Gravity is the fundamental eternal unique force.

'Dark Photon' and 'The Ganapati', the Idol of whole cosmos representing from the Dark Photon to existing all universes will complete the "Standard Model of Elementary Particles".

4. Acknowledgement

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[11] **Refraction of Light** - Hyperphysics http://hyperphysics.phy-astr.gsu.edu/hbase/geoopt/refr.htmlRefraction is the bending of a wave when it enters a medium where its speed is different. The **refraction of light** when it passes from a fast medium to a slow ...

[12] **Dark Energy**, Dark Matter | Science Mission Directorate https://science.nasa.gov/astrophysics/focus-areas/what-is-dark-energyWe know how much **dark energy** there is because we know how it affects the universe's expansion. Other than that, it is a complete mystery. But it is an important ...

[13] Hyperphysics: web: Refraction of Light.

[14] *Bertone, G.; Hooper, D.; Silk, J. (2005). "Particle dark matter: Evidence, candidates and constraints". Physics Reports. **405** (5–6): 279–390. arXiv:hep-ph/0404175. Bibcode:2005PhR...405..279B. doi:10.1016/j.physrep.2004.08.031*.