

Quantum Gravity Chromo Dynamics (QGCD)

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Abstract:

In general relativity, gravity is a consequence of curves in space and time that works perfectly for describing gravity on the macroscopic scale. But when general relativity equations for calculating the outcomes of gravitational interactions are applied to the smallest possible ripples in the space-time fabric the bundles of energy known as gravitons the calculations go with infinities. Physicists have searched for a theory of quantum gravity for 80 years. Though gravitons are individually too weak to detect, most physicists believe the particles roam the quantum realm in drove, and that their behavior somehow collectively gives rise to the macroscopic force of gravity, just as light is a macroscopic effect of particles called photons. But every proposed theory of how gravity particles might behave faces the same problem: upon close inspection, it doesn't make mathematical sense [1]. Most theories containing gravitons suffer from severe problems. Attempts to extend the Standard Model or other quantum field theories by adding gravitons run into serious theoretical difficulties at high energies because of infinities arising due to quantum effects. Since classical general relativity and quantum mechanics seem to be incompatible at such energies, from a theoretical point of view this situation is not tenable. One possible solution is to replace particles by strings. String theories are quantum theories of gravity in the sense that they reduce to classical

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general relativity plus field theory at low energies, but are fully quantum mechanical, contain a graviton, and are believed to be mathematically consistent.

So, to date there is no way to explain the process that describes how particles as photon absorb gravitons. We have studied years long the relationship between gravity and photon in the blue shift phenomena. According to the results of this research we can claim definitely say that there are a few fundamental problems in theoretical physics that causes all these efforts reach to fail. These problems barricade we monitor physical phenomena with the law of nature and not by our laws. We can separate our theories and laws for explaining macroscopic and microscopic phenomena, but nature does not. At the beginning of the 20th century, Newton's second law was corrected considering the limit speed c and the relativistic mass. If we ignore the zero rest mass and modify the relativistic Newton's second law, then much better and more real physical phenomena would be explainable. The speed of the created particles is a function of the internal interaction and the mechanism of creation of subatomic particles, and the external forces that are exerted on them. Quantum gravity using the gauge interaction of a spin-2 field for graviton fails to work the way that the photon and other gauge bosons do. Maxwell's equations always admit a spin-1, linear wave, but Einstein's equations rarely admit a spin-2, linear wave, and when they do it is not exact. However, in the present article the photon is made of gravitons. To resolve this problem, according to gravitational blueshift we need explain this process is using color charged and magnetic color concept that derived from quantum chromodynamics and photon properties for gravitons .

Keywords: graviton, photon, relativity, Blueshift, pair production, color-charge, magnetism color, negative and positive virtual photon, QED, QCD, interactions, broken symmetric, spin, electromagnetic, Zero point energy, Dirac equation, Hawking radiation,

1 Introduction;

Scientists describe the universe in terms of two basic partial theories - the general relativity and quantum mechanics. General theory of relativity describes gravity as the geometry of space; it is called space-time and the large-scale structure of the universe. Quantum mechanics, on the other hands, deals with phenomena on extremely small scales. These two theories are known to be inconsistent with each other, they cannot both be correct. There are many ways to do combine these theories and many theories such as Loop Quantum Theory and String Theory had propounded. But Theory of CPH (Creative Particles of Higgs) takes a new way. CPH Theory has reconsidered 4 theories (Classical Mechanics, Quantum Mechanics, Relativity and Higgs). In fact CPH Theory is a new looking and developing of Quantum Chromodynamic. So, CPH Theory is a Sub Quantum Chromodynamic theory. In fact we must do change our understanding of graviton.

We know there is a unit informer in universe that is photon, and all of our information of universe transfer by photon. Until we do not know everything about photon and its structure, our information's about universe is questionable. Notice that many physicists, such as Faraday and Planck noted the great similarities between electric fields and gravity. Also, gravity and EM waves are related via Einstein's field equations via the energy-momentum tensor of EM field. If a unified field theory can be found, someone must resolve whether or not it is based on particles and gravity fields or electromagnetic fields. But CPH theory is some in between these two concepts.

CPH Theory started of relationship between force and energy. Photon appears to have no further internal substructure. But many phenomenons as Compton's effect, pair production, red-shift and blue-shift... lead CPH Theory show photon has a structure. Theory of CPH have proclaimed by a simply definition of CPH and a principle that calls CPH Principle. In fact CPH theory is an empiric and sensibility theory. And it does different CPH Theory with other theories. Shortly, CPH theory proclaims the following conceptions;

1- When we will be able to explain quantum level phenomenon that we do thinking on sub quantum quantities.

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2- To explaining relationship between fermions and bosons, we must do change our mind of gravity and graviton. In fact gravitons behave like charge or magnet force in sub quantum levels.

3- We never can do combine Quantum mechanics with General Relativity without attention to Higgs theory. In fact there is an especial relationship between force and energy like mass and energy in relativity. This shows we reconsider the second Newton's law. It shows a unified theory comes up of reconsideration the quantum mechanics, relativity, Higgs theory and classical mechanics.

In CPH Theory, the ZPE (Zero Point Energy) explained by using a novel description of the graviton. This is based on the behavior of photons in a gravitational field, leading to a new definition of the graviton. In effect, gravitons behave as if they have charge and magnetic effects. These are referred to as negative color charge, positive color charge and magnetic color. From this, it can be shown that a photon is made of color charges and magnetic color. This definition of the structure of a photon leads to an explanation of how the vacuum produces Zero Point Energy (ZPE).

Also, these color charges and magnetic color form the electromagnetic energy. Electromagnetic energy converts to matter and anti-matter such as charged particles. Charged particles use gravitons and generate electromagnetic field. In fact, a charged particle is a generator for producing virtual photons, both negative and positive photons. This view shows how two same charged particles repel each other in greater distance and absorb each other at a very small distance. To conclude, it shows how quarks produce vector bosons. In general, it appears that all known interactions between charged particles can be described through the negative and positive color charges.

2- Review and Compare Theories

2-1 Universal gravitational law: Newton's law of universal gravitation states that any two bodies in the universe attract each other with a force that is directly proportional to the product of their masses and inversely proportional to the square of the distance between them. Separately it was shown that large spherically symmetrical masses attract and are attracted as if all their mass were concentrated at their centers. Newton's claim that gravity is a universal force was contradicted by observations that seemed to show the stars were motionless. When challenged on this by Richard Bentley, he argued that the solution lay in the near-perfect symmetry of the stellar system. William Stukeley however suggested that in such a universe the sky would be filled with light similar to the Milky Way. Edmond Halley disputed this in print, but mistakenly, and later discussions of such a universe led to 'Olbers's Paradox' [2]. Assume that the observable universe would collapse by gravity, is there any force that can counteract with gravity collapse in the universe? In other word, after collapsing universe, how and by which law (or force) universe will expand again? We will answer this question.

2-2 Relativity: In 1905 Albert Einstein introduced his theory of special relativity. With this theory Einstein sought to make the laws of motion consistent with James Clerk Maxwell's laws of electromagnetism. Einstein basically sided with Maxwell! Special relativity makes two postulates: The laws of physics are the same for all non-accelerating observers. The speed of light in vacuum is independent of the motion of all observers and sources, and is observed to have the same value.

Consider reviewing in the special relativity postulates, always raises some questions like, "Is the constant speed of light (photon energy), resulting from a natural accident?" or "what is the difference between mass characteristics and energy features while the energy rate is fixed the speed of matter can be changed but it can not reach the speed of light". Meanwhile when the physical and chemical processes occur, some amount of matter is converted into energy; what happened during this process, that mass with non-constant speed is converted into energy with the constant speed? The main part of this article, according to the fundamental particle physics theories and energy issues in the production and decay of pairs of matter-antimatter are included in finding the common features between matter and energy which can be considered the constant velocity of photon as a property that can be transmitted from matter into energy and vice versa and also differences in the mass, structure of matter and its relation fields are explained by the relationship between length contraction (reduce in volume) and relativistic mass and relativistic form of Newton second law which show the mass variations (i.e., the infinite speed in classical mechanics is replaced by the infinite mass).

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In general relativity Einstein describes gravity not as a force, but as a consequence of curvature of this combined space-time. In our experience this curvature can be ignored. The Principle of Equivalence: The Laws of Physics have the same form in every uniformly accelerated laboratory as they do in an un-accelerated laboratory in a uniform gravitational field. Einstein showed that the path of light in gravity field is not straight and it is curveting. He did use tensors for showing space-time's equations in curveting space. A blueshift is any decrease in wavelength (increase in frequency); the opposite effect is referred to as redshift. In visible light, this shifts the color from the red end of the spectrum to the blue end. An observer in a gravity well will also see in falling radiation gravitationally blueshifted, described by General Relativity in the same way as gravitational redshift. In a contracting universe, cosmological blueshift would be observed; the expanding universe gives a cosmological redshift, and the expansion is observed to be accelerating.

2-3 Singularity: A gravitational singularity or spacetime singularity is a location where the quantities that are used to measure the gravitational field become infinite in a way that does not depend on the coordinate system. These quantities are the scalar invariant curvatures of spacetime, which includes a measure of the density of matter. For the purposes of proving the Penrose–Hawking singularity theorems, a spacetime with a singularity is defined to be one that contains geodesics that cannot be extended in a smooth manner.[5] The end of such a geodesic is considered to be the singularity. This is a different definition, useful for proving theorems. The two most important types of spacetime singularities are curvature singularities and conical singularities.[6] Singularities can also be divided according to whether they are covered by an event horizon or not (naked singularities).[7] According to general relativity, the initial state of the universe, at the beginning of the Big Bang, was a singularity. Both general relativity and quantum mechanics break down in describing the Big Bang. [8]

Einstein tried to propound geometrical structure of space by mathematical equations. So, he used non-Euclidian geometry. There are four considerable notations about Einstein's equations;

1- Einstein Field Equations not come up of equivalence principle directly. These equations are simply equations that are suitable with general relativity.

2- It's worth remembering that the generally covariant formalism had been developed only in 1901 by Ricci and Levi-Civita, and the first real use of it in physics was Einstein's formulation of general relativity.

3- There is any physical explain about path of light in gravitational field. Although explaining of frames reference is physical conception, but there is not any explain how gravitational field affects on photons.

4- Space-time is a continuously quantity in general relativity. But changing of photon frequency and producing of energy is quantized. That gravitational blueshift (or redshift) is a special case of gravitational field affects on photon. [3]

Question is that how we can explain the gravitational blueshift by according the relationship between photon energy and its frequency?

With several issues being raised in the late twentieth century, modern physics was challenged and while quantum mechanics and relativity did not have the ability to respond and resolve issues also they cannot do it today. Despite such problems, physicists are trying to find an appropriate and convincing response only on the scope of quantum physics and relativity and in this respect need to pay attention to the classical mechanics. Series of failures exist in some categories of these theories, that prior to their use, they should be clarified and resolved. Regarding on review of Newton's second law in this paper, we have been attempted to enter to the sub-quantum space by crossing the border of quantum mechanics then to survey of counteracting Newton's second law and the universal gravitation law and finally we can be analyzed and investigated the results. In sub-quantum space, we passed across the black hole and reach the formation of the absolute black hole by specifying the limits of Newton's second law and gravitation law, and then the singularity will be explained in the explosion of an absolute black hole. In this review we will be forced to change their attitude towards the singularity and the general conclusion in the singularity state is: volume will not be zero, density will be limited, the time is not a physical quantity (absolute or relative) and a human as an observer (who is not neutral) has invented the time just for using it to the explain the ticking

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clock. We use the time just for the clock ticking and in different physical situations we can only examine the working of the clocks or compare them to each other. [15]

2-4 Quantum electrodynamics: The subfield of physics that explains the interaction of charged particles and light is called quantum electrodynamics. Quantum electrodynamics (QED) extends quantum theory to fields of force, starting with electromagnetic fields. Quantum electrodynamics, or QED, is a quantum theory of the interactions of charged particles with the electromagnetic field. It describes mathematically not only all interactions of light with matter but also those of charged particles with one another. QED is a relativistic theory in that Albert Einstein's theory of special relativity is built into each of its equations. Because the behavior of atoms and molecules is primarily electromagnetic in nature, all of atomic physics can be considered a test laboratory for the theory. Agreement of such high accuracy makes QED one of the most successful physical theories so far devised.

In 1926 the British physicist Dirac laid the foundations for QED with his discovery of an equation describing the motion and spin of electrons that incorporated both the quantum theory and the theory of special relativity. The QED theory was refined and fully developed in the late 1940s by Richard Feynman, Julian S. Schwinger, and Shin'ichiro Tomonaga, independently of one another. QED rests on the idea that charged particles (e.g., electrons and positrons) interact by emitting and absorbing photons, the particles of light that transmit electromagnetic forces. These photons are virtual; that is, they cannot be seen or detected in any way because their existence violates the conservation of energy and momentum. The particle exchange is merely the "force" of the interaction, because the interacting particles change their speed and direction of travel as they release or absorb the energy of a photon. Photons also can be emitted in a free state, in which case they may be observed. The interaction of two charged particles occurs in a series of processes of increasing complexity. In the simplest, only one virtual photon is involved; in a second-order process, there are two; and so forth. The processes correspond to all the possible ways in which the particles can interact by the exchange of virtual photons, and each of them can be represented graphically by means of the diagrams developed by Feynman. Besides furnishing an intuitive picture of the process being considered, this type of diagram prescribes precisely how to calculate the variable involved.

Notice the elimination of action at a distance, the interaction is due to direct contact of the photons. In the 1960's, a formulation of QED led to the unification of the theories of weak and electromagnetic interactions. This new force, called electroweak, occurs at extremely high temperatures such as those found in the early Universe and reproduced in particle accelerators. Unification means that the weak and electromagnetic forces become symmetric at this point, they behave as if they were one force. Electroweak unification gave rise to the belief that the weak, electromagnetic and strong forces can be unified into what is called the Standard Model of particles.

Quantum chromodynamics is the subfield of physics that describes the strong or "color" force that binds quarks together to form baryons and mesons, and results in the complicated force that binds atomic nuclei together. Quantum chromodynamics, or QCD, is the theory that describes the action of the strong nuclear force. QCD was constructed on analogy to quantum electrodynamics (QED), the quantum theory of the electromagnetic force. In QED, the electromagnetic interactions of charged particles are described through the emission and subsequent absorption of massless photons, best known as the "particles" of light; such interactions are not possible between uncharged, electrically neutral particles. The strong force is observed to behave in a similar way, acting only upon certain particles, principally quarks that are bound together in the protons and neutrons of the atomic nucleus, as well as in less stable, more exotic forms of matter. So by analogy with QED, quantum chromodynamics has been built upon the concept that quarks interact via the strong force because they carry a form of "strong charge," which has been given the name of color; other particles, such as the electron, which do not carry the color charge, do not interact in this way.

In QED there are only two values for electric charge, positive and negative, or charge and anticharge. To explain the behavior of quarks in QCD, by contrast, there need to be three different types of color charge, each of which can occur as color or anticolor. The three types of charge are called red, green, and blue in analogy to the primary colors of light, although there is no connection whatsoever with color in the usual sense. Color-neutral particles occur in one of two ways. In baryons (i.e., particles built from three quarks, as, for example, protons and neutrons), the three quarks are each of a different color, and a mixture of the three colors produces a particle that is neutral. Mesons, on the other hand, are built from pairs of

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quarks and antiquarks, and in these the anticolor of the antiquark neutralizes the color of the quark, much as positive and negative electric charges cancel each other to produce an electrically neutral object.

2-5 Mysteries of Standard Model: We wanted to note the success and mysteries of Standard Model shortly. But we would prefer the following quote from Gordon Kane has beautifully expressed [9]. The Standard Model of particle physics is at a pivotal moment in its history: it is both at the height of its success and on the verge of being surpassed. The Standard Model of particle physics is the most successful theory of nature in history, but increasingly there are signs that it must be extended by adding new particles that play roles in high-energy reactions. Major experiments are on the verge of providing direct evidence of these new particles. After 30 years of consolidation, particle physics is entering a new era of discovery. Many profound mysteries could be resolved by post Standard Model physics. There are some reasons for extending the Standard Model arises from phenomena it cannot explain or cannot even accommodate:

1. All our theories today seem to imply that the universe should contain a tremendous concentration of energy, even in the emptiest regions of space. The gravitational effects of this so-called vacuum energy would have either quickly curled up the universe long ago or expanded it to much greater size. The Standard Model cannot help us understand this puzzle, called the cosmological constant problem.

2. The expansion of the universe was long believed to be slowing down because of the mutual gravitational attraction of all the matter in the universe. We now know that the expansion is accelerating and that whatever causes the acceleration (dubbed "dark energy") cannot be Standard Model physics.

3. There is very good evidence that in the first fraction of a second of the big bang the universe went through a stage of extremely rapid expansion called inflation. The fields responsible for inflation cannot be Standard Model ones.

4. In the Standard Model, interactions with the Higgs field (which is associated with the Higgs boson) cause particles to have mass. The Standard Model cannot explain the very special forms that the Higgs interactions must take.

5. The Standard Model cannot include gravity, because it does not have the same structure as the other three forces.

In expressing these mysteries, when I say the Standard Model cannot explain a given phenomenon, I do not mean that the theory has not yet explained it but might do so one day. The Standard Model is a highly constrained theory, and it cannot ever explain the phenomena listed above. Possible explanations do exist. One reason the supersymmetric extension is attractive to many physicists is that it can address all but the second and the last three of these mysteries. String theory (in which particles are represented by tiny, one-dimensional entities instead of point objects) addresses the last three [10]. The phenomena that the Standard Model cannot explain are clues to how it will be extended.

When we used sub quantum energy to explain the interactions between photon and charged particle, we found that the interaction of charged particles and light is based on a concept; "During the conversion of energy into mass, the interaction properties between the Sub Quantum Energies (SQEs) are transferred from photon to fermions and bosons". We have begin with this question whether the gravity is the effect of mass or gravity which produces mass? Although gravity is the first force known in physics, our knowledge of gravity is less than other forces. We have accepted that nature of gravity is quantized, but according to the behavior of photons in the gravitational field, we provide a new definition of gravitons. Then we explain the relationship between gravity and electromagnetic energy. According to the experimental observations, we generalize the Maxwell equations of electromagnetism to the gravitational field. We use the pair production and decay to show that a charged particle acts like a generator, the generator input and output are gravitons and virtual photon. The negative charged particle produces positive virtual photon and positive charged particle produces negative virtual photon. A negative and a positive virtual photon combine with each other in the vicinity of a charged particle and cause the charged particle to accelerate.

Although this approach to Quantum Field Theory (QFT) is presented, it has some differences. The mechanism of negative and positive virtual photons interaction is easier and more realistic than exchange particles of QFT, and it also has no ambiguities of QFT. After all, we explain the real photon and its structure by using the virtual photons. Regarding the equivalence of mass-energy and the photon structure,

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structure of matter was explained. Then we will explain the relationship between speed and spontaneous symmetry breaking, when the particles linear speed is reduced, physical symmetry, one after the other is broken spontaneously.

3 The Photon in a gravitational field

Look at the behavior of a photon in a gravitational field. The fields around a "ray of light" are electromagnetic waves, not static fields. The electromagnetic field generated by a photon is much stronger than the associated gravitational field. Suppose a photon falls in a gravitational field, its energy (mass) increases as $\Delta E = \Delta mc^2$. The force of gravity performs work on the photon, so the mass (energy) of the photon increases too. However, the energy of a photon depends on its electric and magnetic fields. Therefore, one part of the work done by gravity converts to electrical energy and the other part converts to magnetic energy. How can the Higgs boson show how particles acquire mass? Moreover, according to the Higgs boson, what happens in during the blue shift? In quantum mechanical theory, every field is quantized. In addition, force is described as energy per distance shown by: $F = -dU/dx$. We can define units that for length we take $dx=1$, so that $F = -dU$ [11]. If we consider this equation from the aspect of quantum mechanics, a few graviton that are carrying gravitational force, enter into the structure of photon, and energy of photon increases. As a result, a few gravitons disappear and the energy of the photon increases. Similarly, Red Shift has the opposite effect. As a photon escapes from a gravitational field, its frequency shifts to red and its energy converts to gravitons. How can we describe this interaction between photons and gravitons on a sub quantum scale such as in the structure of a photon?

3-1 Rest mass: Now it is possible to change the definition of the rest mass of a particle. As we know, some particles such as photons are never seen at rest in any reference frame. According to relativity however, they do have mass that derives from their energy. For example, a photon has a mass given by: $m = h\nu/c^2$, So, there are two kinds of particles in physics;

1- Some particles like the photon move only with the speed of light c , in all inertial reference frames. Let's call this kind the NR particles or Never at Rest condition particles

2- Other particles like the electron always move with speed $v < c$ in all inertial reference frames; they have a rest mass, and could not call NR particles, that we can call them particles.

According to above definition, photons and gravitons are NR particles, while electrons and protons are particles. Now let's come back to blueshift. In interaction between gravity and photon (blueshift), when gravity acts on photon and gravitons enter to photon, gravitons do change the intensity of electricity field and magnetic field belongs to photon. So, gravitons behave so that they are carrying charged and magnetic effects in the structure of photon. According to quantum mechanics the gravitational field is made up of gravitons. When gravitons enter into photon, the intensity of electricity and magnetic field increase, but photon has no electric effect. So, there should be two groups of gravitons that behave like electric field and a group annihilates the electric effect of other group. So, a group of graviton behaves like positive electric field and other one behaves like negative electric field and they annihilate each other electric effect. But they are moving, so a group of gravitons behave like magnetic field, and two vertical electric field and magnetic field do appear. So, gravitons are color charge or color magnet. When a photon shifts to blue in a gravitational field, gravitons convert to electromagnetic energy. In fact gravitons convert to color charge and magnetic color and enter into electric field and magnetic field of photon. It is acceptable because when photon is falling in gravitational field, its electric field and magnetic field increase. So, a Photon is made up of color charges and magnetic color, that they have linear speed equal c with photon motion and nonlinear speed in the structure of photon, so they are moving faster than light speed.

3-2 Speed of graviton: It is important that we note to speed of graviton (also color charge and magnetic color) that shown with V_g and explained before, its speed is faster than light speed, so that $V_g > c$, that V_g is sum of linear and nonlinear speed of graviton (or color charge and magnetic color), so that:

$$\text{grad}V_g=0 \text{ in all inertial reference frames and any space} \quad (1)$$

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Many physicists believe that the graviton does not exist, at least not in the simplistic manner in which it usually envisioned. Superficially speaking, quantum gravity using the gauge interaction of a spin-2 field (graviton) fails to work the way that the photon and other gauge bosons do. Maxwell's equations always admit a spin-1, linear wave, but Einstein's equations rarely admit a spin-2, linear wave, and when they do, it is not exact. However, in the present article the photon is made up of gravitons. To resolve this, we need to continue with the definition of CPH and the Principle of CPH and then return to properties of a graviton.

What is a CPH? It is the Creative Particle of Higgs, or, CPH is an existence unit of nature. In other words, everything is made of CPH. Therefore, a CPH is appropriately referred to as the unit of nature, although this not meant to be a "particle" as this concept has been traditionally referred to in physics. A CPH is a NR particle of a kind nonetheless, with a constant NR mass CPH m , that moves with a constant magnitude speed of $V_{CPH} > c$ in any inertial reference frame, where c is the speed of light. When a CPH has spin, it is called a graviton. So, CPH does obey of relation (1), because its magnitude of speed is constant in any reference frame and any space. (For more see [12]). Accordingly, a CPH with spin is called a graviton, so space is full of CPH.

4 Sub Quantum Energy SQE

A sub quantum energy or SQE is a minimum set of color charges and magnetic color that has electromagnetic energy properties (that it is undetectable, see virtual photon). Every photon is made up of a number of SQEs, so that photon energy E given by $E=nSQE$, where n is an integer, and n depends to photon frequency, this proportion does not claim that n is equal the frequency of photon, but simply represents the this physical fact that frequency has direct relation with the number and interactions of SQEs in the photon structure. Also for SQE we can shown:

$$\text{grad } V_{SQE}=0 \text{ in all inertial reference frames and any space} \quad (2)$$

This relation shows that in every condition the speed value of SQE remains constant and only the linear speed of SQE converts to nonlinear speed or vice versa. Besides the relation between SQE's, we could conclude that the SQE linear speed in vacuum relative to the inertial frames of reference is actually the speed of light c . Since SQE in photon's structure has a linear speed equal to c and also it has nonlinear motions, the real speed of SQE is when all SQE nonlinear motions turn into linear motions and it only takes linear motion. In other words the limit speed of SQE is $VSQE$ which is faster than light speed c , i.e.

Thus there should be a logical explanation between energy increases and frequency increases. therefore, based on SQE definition and relation (2) could relate the relation between photon's energy and frequency and the interaction between SQE's in photon's structure, i.e. with the increase number of SQE's in photons, the interaction between SQEs in photon will increases and the frequency that originates from the interaction between SQE's will increases too.

Note: When comparing the two relations (1) and (2), one question arises in terms of speed: what difference is there between V_g and $VSQW$? The answer is that the linear velocity of a particular is as a function of the internal interactions of the SQEs that particle is made up them and properties of particle. Therefore, electrons and other particles cannot reach the speed of light c . Consider that a Gama photon moves with speed c , and when converts to electron and positron, they move with speed $v < c$. Also, photon, electron and positron are made up of SQEs.

4-1 ZPE: Zero Point Energy (ZPE) describes the random electromagnetic oscillations that are left in the vacuum after all other energy has been removed. One way to explain this is by means of the uncertainty principle of quantum physics, which implies that it is impossible to have a zero energy condition.

Space is full of gravitons. Gravitons interact with each other and convert to color charges; Interaction between gravitons depends on their density $r \rho(g)$ in a given volume. According to the above expression, we are able to explain the mechanism of ZPE. Some gravitons with the same NR mass of m convert to

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color charges, and two electric fields form. These fields neutralize each other. However, positive color charges repel each other, and the same action applies to the negative color charges. Therefore, when the intensity of color charges grows, about each field (negative and positive fields) a magnetic field forms. This magnetic field maintains the electric field. In a simplified version of the explanation, Hawking predicted that energy fluctuations from the vacuum cause the generation of particle-antiparticle pairs near the event horizon of a black hole. One of the particles falls into the black hole while the other escapes before they have an opportunity to annihilate each other. The net result is that to someone viewing the black hole, it would appear that a particle has been emitted. How is Hawking radiation explainable by the equation for the ZPE? To resolve this problem, there are three aspects of a black hole to consider;

- The density of gravitons is extremely high around a black hole
- Gravitons convert to photons readily
- The Dirac equation shows how photons produce matter and anti-matter.

According to the above expression, the space around a black hole produces high energy photons whose energy is enough for pair production. (For more see; [12, 13]).

According to the Definition of SQE, we are able to reconsider the gravitational blueshift, Pair Creation and Decay, Boucher Experiment, better and easier than before. Newton's second law is the only relation that shows the interaction between force and matter. This equation has the sufficient efficiency to explain and investigate physical phenomena, when it would be formulated based on the natural reality of matter and the effect of force on the matter. The reality is that the external force, no way and under any physical condition, could not change the speed value and it only could convert the linear motion of the constituting particles of matter and energy to the nonlinear motion and vice versa. Moreover, one could explain the expansion of the universe better and more real through reviewing Newton's second law (For more see; [12], [14]).

5 Definition of Singularity due to Newton's Second Law Counteracting Gravity

In classical mechanics, a massive body can continue to grow by absorbing mass from its surroundings. Also, Gravity is described as an attractive force between masses. Also, absolute time and space respectively are independent aspects of objective reality.

Quantum mechanics is based on uncertainty and probability. According to these laws, elementary particles are not the infinitesimally. The occurrence of quantum mechanical singularities in certain spherically symmetric and cylindrically symmetric (including infinite line mass) space times is considered.

According to general relativity a singularity, space and time cease to exist as we know them. Thus the usual laws of physics break down near such a singularity. So it's not really possible to envision something with infinite density and zero volume. In the SR and GR, time dilation is an actual difference of elapsed time between two events as measured by observers either moving relative to each other or differently situated from gravitational masses.

Sub quantum describes every particle is made up of SQEs.. A SQE is not the infinitesimally. SQE has volume and non-zero rest mass. We considered to interactions between a SQE and external force that applied on SQE. In singularity of an absolute black, gravity force changes of attractive force to repulsive force. The time is not included SQEs. And each physical existence is a clock and the time is a name that we use for the ticking clock. It is very well consistent with the inflation theory. In addition, we showed that how we can use the sub-quantum space to describe nature of time in order to understand better the nature of space-time. With a detailed look at the sub-quantum space, we can investigate better the interaction between quarks in a very small space of proton. Using such approach to generate matter-anti matter, we can explain that how Bosons are generated from fermions and then can provide an important context for the unification of forces. (For more see [15]).

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6 Sub Quantum Energy and Interactions Properties

Precise understanding of strongly interacting fermions, from electrons in modern materials to nuclear matter, presents a major goal in modern physics. We think that gravitons and the given structure of elementary particles are useful in better understanding of the interaction between fermions. In quantum electrodynamics (QED) a charged particle emits exchange force particles continuously. This process has no effect on the properties of a charged particle such as its mass and charge. How is it explainable? If a charged particle as a generator has an output known as a virtual photon, what will be its input? Now we explained the mechanism of electrodynamics fields around the electron and positron.

Look at the electron and positron. Electron is in the centre of a spherical space. The electron contains a number SQEs. This rotational sphere-like (electron spinning) is in a look into gravitons. The electron has two opposite interactions on gravitons around it, and converts them to negative and positive color charges. Also, magnetic field around the electron acts on negative and positive color charges. Magnetic field (electron spinning) compresses positive color charges and repels them. We can define an operator for the production of positive and negative electric force particles that call virtual photon in physics. In general, a charged particle is a generator that its input is gravitons and its output is virtual exchange particles that form the electric field. When a virtual photon from the electron reaches to around the positron, it combines with oposit virtual photon and they form quantum energy. This quantum energy is transferred to the positron, and positron accelerates toward the electron. The same process repeat, when next virtual photon reaches around the positron. Same process happens for electron.

There are many ambiguities in modern physics that standard model is not able to answer them [9]. For solving these ambiguities we need to change our approach to fundamental particles. Is it logical that we have accepted an unstructured photon with zero rest mass is convertible to two fermions with non-zero mass and different charges? As long as we do not change our view on the photon, solving physics problems seems very unlikely.

Attention to photon structure and using new definitions for graviton, charged and exchange particles, will change our perspective on modern physics. It also provides us with a new tool to be able to overcome physics problems in a better way. This approach will show us how particles are formed and when physical symmetries are broken spontaneously (For more see [16]).

Conclusion

According to this article we have generalized color charge from the nuclear regime to the photon. This new view of color charge means that we can redefine the graviton and electromagnetic energy. Gravitons behave like charged particles and in the interaction between gravity and the photon, gravitons convert to negative and positive color charges and magnetic color. These color charges and magnetic color form the electromagnetic energy. Electromagnetic energy converts to matter and anti-matter as charged particles. Gravitational blueshift indicates that energy is a condensed or concentrated field, also Einstein's equation, $E=mc^2$, says that mass is actually a concentrated form of energy. Summarized in a simple conclusion:

$$\text{Gravitational energy} \Leftrightarrow \text{Electromagnetic energy} \quad (3)$$

$$\text{Electromagnetic energy} \Leftrightarrow \text{Matter+Antimatter} \quad (4)$$

For identifying mechanism of physical relationship between the two sides (3), and converting gravitational energy into electromagnetic energy and vice versa, we must use the equations of Maxwell's electromagnetic theory to explain gravitons. And for relation (4), using pair production and decay. This view shows how particles appear and when Spontaneous Symmetry Breaking has occurred.

$$\begin{aligned} &|V_{CPH}| \gg c \quad \text{CPH has not spin} \\ &\text{CPH is isolation and moves on one axes that never seems} \end{aligned}$$

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$$c \leq |V_{x-cph}| + |V_{y-cph}| + |V_{z-cph}| < |V_{CPH}| \quad \text{CPH has spin that calls graviton}$$

Space (vacuum) is full of graviton that is able produce electromagnetic energy (ZPE)
Gravitons convert to color charge and magnetic color and form electromagnetic wave

$$|V_{x-cph}| + |V_{y-cph}| + |V_{z-cph}| = c$$

Electric and magnetic fields appear
The first Spontaneous Symmetry Breaking has occurred.

$$|V_{x-cph}| + |V_{y-cph}| + |V_{z-cph}| < c$$

Matter and anti-matter appear
Spontaneous Symmetry Breaking has occurred.

When Spontaneous Symmetry Breaking has occurred, fundamental particles appear. For example, reconsider pair production, before of pair production, there is a photon only, but after of pair production, there are an electron, a positron and virtual photons (boson) that carry electric force.

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