the general science journal

English CPH E-Book

Section 3

Theory of CPH

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Contains:

Introduction

Theory of CPH have proclaimed by a simply definition of CPH and a principle that calls CPH Principle. By a looking, seems Definition and principle of CPH are understandable easy, but in discussion with other physicist I found for understanding CPH Theory, it needs to time and precision. Because traveling our mind of quantum mechanics and relativity word to sub-quantum area has combined with its difficulties.
For these reasons a section of e-book belongs to old discussion on CPH Theory.
So, I guess over than precision I guess read discussion section.
Any fresh opinions are most welcome.

With Best Regards
Hossein Javadi

What means CPH?

CPH stands of three words Creation Particle Higgs. But question is what the Higgs is?
The **Higgs boson** is a hypothetical massive scalar elementary particle predicted to exist by the Standard Model of particle physics. As of 2006, no experiment has directly detected the existence of the Higgs boson, but there are indirect indications of it. The Higgs boson was first predicted in 1963 by Peter Higgs.
The particle called Higgs boson is in fact the quantum of one of the components of a Higgs field. In empty space, the Higgs field acquires a non-zero value, which permeates every place in the universe at all times.
CPH Theory has reconsidered 4 theories (Classical Mechanics, Quantum Mechanics, Relativity and Higg). In fact CPH Theory is a new looking and developing of **Quantum Chromodynamic**. So, CPH Theory is a **Sub Quantum Chromodynamic theory**.
In this section I will show graviton that quantum mechanics have propounded behaves like charge particle. So, it is a great step for combining Quantum Mechanics and General Relativity and finding a unification theory. In a summary we must do change our conception of graviton. Our conceptions of graviton depend to our knowledge about graviton and photon that come of quantum mechanics and relativity. So, of the first let's to that what are photon and graviton in modern physics. Then I Beginning CPH Definition by color-charge and magnet-color, according the electromagnetic wave and its behavior in gravitational field that has explained in aforetime sections.

Graviton

In physics, the **graviton** is a hypothetical elementary particle that transmits the force of gravity in most quantum gravity theories. In order to do this, one theory posits that gravitons have to be always-attractive (gravity never pushes), work over any distance (gravity is universal) and come in unlimited numbers (to provide high strengths near stars). In quantum theory, these requirements define an even-spin (spin 2 in this case) boson with a rest mass of zero.

Gravitons are postulated simply because quantum theory has been so successful in other fields. For instance, the electromagnetic interaction can be very well explained by the application of quantization to photons, a science known as quantum electrodynamics. In this case photons are being continually created and destroyed by all charged particles, and the interactions between these photons produce the familiar effects of electricity and magnetism. In the same way, the strong nuclear force and the weak nuclear force are mediated by gluons and by W and Z bosons, respectively.

Given the widespread success of quantum theory in describing the basic forces in the universe except for gravity, it seemed only natural that the same methods would work well on gravity as well. Many attempts finally led to introduction of a so-far unseen graviton, which would work in a fashion somewhat similar to the photon, the gluon etc. It was hoped that this would quickly lead to a quantum gravity theory; although the mathematics became convoluted and no internally consistent theory has yet emerged.

Gravitons and models of quantum gravity

While the classical theory (i.e. the tree diagrams) and semi-classical corrections (one-loop diagrams) behaved as expected, the Feynman diagrams with two (or more) loops led to ultraviolet divergences; that is, infinite results that could not be removed because the quantized general relativity was not re-normalizable, unlike quantum electrodynamics. In popular terms, the discreteness of quantum theory is not compatible with the smoothness of Einstein's general relativity. These problems, together with some conceptual puzzles, led many physicists to believe that a theory more complete than just general relativity must regulate the behavior near the Planck length. Superstring theory finally emerged as the most promising solution; it is the only known theory in which the quantum corrections of any order to graviton scattering are finite.

String theory predicts the existence of gravitons and their well-defined interactions which represents one of its most important triumphs. A graviton in perturbative string theory is a closed string in a very particular low-energy vibrational state. The scattering of gravitons in string theory can also be computed from the correlation functions in conformal field theory, as dictated by the AdS/CFT correspondence, or from Matrix theory.

An interesting feature of gravitons in string theory is that, as closed strings without endpoints, they would not be bound to branes and could move freely between them; this "leakage" of gravitons from our brane into higher-dimensional space could explain why

gravity is such a weak force, and gravitons from other branes adjacent to our own could provide a potential explanation for dark matter. See brane cosmology for more details.

Some proposed quantum theories of gravity do not predict a graviton. For instance, loop quantum gravity has no analogous particle.

Gravitons and experiments

Detecting a graviton, if it exists, would prove rather problematic. Because the gravitational force is so incredibly weak, as of today, physicists are not even able to directly verify the existence of gravitational waves, as predicted by general relativity. (Many people are surprised to learn that gravity is the weakest force. A simple experiment will demonstrate this, however: an ordinary refrigerator magnet can generate enough force to lift a mass against the force of gravity generated by the entire planet.)

Gravitational waves may be viewed as coherent states of many gravitons, much like the electromagnetic waves are coherent states of photons. Projects that should find the gravitational waves, such as LIGO and VIRGO, are just getting started.

Problems with the Graviton

Many believe the graviton does not exist, at least in the simplistic manner in which it is envisioned. Superficially speaking, quantum gravity using the gauge interaction of a spin-2 field (graviton) fails to work like the photon and other gauge bosons do.

But more importantly the spin-2, linear wave (classical gravitational wave) is only a perturbation on certain, highly restrictive metrics. In general there are wave-like fluctuations, but they are non-linear, as is often the case in General Relativity. 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 only perturbative and not exact.

The more analogous gravitational object to the electromagnetic wave is actually the Weyl curvature. In classical electromagnetism you have fields determined by sources along with electromagnetic waves that are source-free. And in gravity, the Ricci curvature is determined by the stress-energy tensor along with the source-free Weyl tensor which contains the gravitational waves.

Photon

A photon is usually given the symbol γ, the Greek letter gamma, although in nuclear physics this symbol refers to a very high-energy photon (a gamma ray).
The photon is one of the elementary particles. Its interactions with electrons and atomic nuclei account for a great many of the features of matter, such as the existence and stability of atoms, molecules, and solids. These interactions are studied in quantum electrodynamics (QED), which is the oldest part of the Standard Model of particle physics.

In some respects a photon acts as a particle, for instance when registered by the light sensitive device in a camera. In other respects, a photon acts like a wave, as when passing through the optics in a camera. According to the so-called wave-particle duality in quantum physics, it is natural for the photon to display either aspect of its nature, according to the circumstances. Normally, light is formed from a large number of photons, with the intensity related to the number of them. At low intensity, it requires very sensitive instruments, used in astronomy or spectroscopy, for instance, to detect the individual photons.

Properties of Photon

Photons are commonly associated with visible light, but this is actually only a very limited part of the electromagnetic spectrum. All electromagnetic radiation is quantized as photons: that is, the smallest amount of electromagnetic radiation that can exist is one photon, whatever its wavelength, frequency, energy, or momentum, and that light or fields interact with matter in discrete units of one or several photons. Photons are fundamental particles. They can be created and destroyed when interacting with other particles, but are not known to decay on their own.

A photon of a definite frequency is not a localized particle. Photons thus exhibit a position/frequency uncertainty relation similar to that of matter particles and exactly analogous to the bandwidth theorem of classical optics. Photons have zero mass and zero electric charge, but they do carry energy, momentum and angular momentum. Photons are always moving, and photons in a vacuum always move at a constant speed with respect to all observers, regardless of the observers' own velocities. This speed is called the vacuum speed of light. The energy and momentum carried by a photon is proportional to its frequency (or inversely proportional to its wavelength). This momentum can be transferred when a photon interacts with matter. The force due to photons interacting with a surface is called radiation pressure, which may be used for propulsion with a solar sail.

Photons are deflected by a gravitational field twice as much as Newtonian mechanics predicts for a mass traveling at the speed of light. This observation is commonly cited as evidence supporting Einstein's theory of gravitation, general relativity. In general relativity, photons (as well as any other object in a free fall) always travel in a "straight"

line, taking into account the curvature of space-time. (In curved space, such lines are called geodesics).

Creation

Photons are produced by atoms when a bound electron moves from one orbital to another orbital with less energy. Photons can also be emitted by an unstable nucleus when it undergoes some types of nuclear decay. Furthermore, photons are produced whenever charged particles are accelerated.

Atoms continuously emit photons due to their collisions with each other. The wavelength distribution of these photons is thus related to their absolute temperature. The Planck distribution determines the probability of a photon being a certain wavelength when emitted by a collection of atoms at a given temperature. The spectrum of such photons is normally peaked in the range between microwave and infrared, but sufficiently hot objects (such as the surface of the Sun or a light-bulb filament) will emit visible light as well. As temperature is further increased, some photons will reach even higher frequencies, such as ultraviolet and X-ray.

Radio, television, radar and other types of transmitters used for telecommunication and remote sensing routinely create a wide variety of low-energy photons by the oscillation of electric fields in conductors. Magnetrons emit coherent photons used in household microwave ovens. Klystron tubes are used when microwave emissions must be more finely controlled. Masers and lasers create monochromatic photons by stimulated emission. More energetic photons can be created by nuclear transitions, particle-antiparticle annihilation, and in high-energy particle collisions.

Spin

Photons have spin 1, and they are therefore classified as bosons. Photons mediate the electromagnetic interaction; they are the gauge bosons of quantum electrodynamics (QED), which is a U(1) gauge theory. A non-relativistic spin-1 particle has three possible spin states (−1, 0 and +1). However, in the framework of special relativity, this is not the case for massless spin-1 particles, such as the photons, which have only two spin projections, felicities, corresponding to the right- and left-handed circular polarizations of classical electromagnetic waves. The more familiar linear polarization is formed by a superposition of the two spin projections of a photon

Quantum state

Visible light from ordinary sources (like the Sun or a lamp) is a mixture of many photons of different wavelengths. One sees this in the frequency spectrum, for instance by passing the light through a prism. In so-called "mixed states", which these sources tend to produce, light can consist of photons in thermal equilibrium (so-called black-body radiation). Here they in many ways resemble a gas of particles. For example, they exert pressure, known as radiation pressure.

On the other hand, an assembly of photons can also exist in much more well-organized coherent states, such as in the light emitted by an ideal laser. The high degree of precision obtained with laser instruments is due to this organization.

The quantum state of a photon assembly, like that of other quantum particles, is the so-called Fock state denoted $|n\rangle$, meaning n photons in one of the distinct "modes" of the electromagnetic field. If the field is multimode (involves several different wavelength photons), its quantum state is a tensor product of photon states, for example:

$$|n_{k0}\rangle \otimes |n_{k1}\rangle \otimes \ldots \otimes |n_{kn}\rangle \ldots$$

Here k_i denote the possible modes, and n_{k_i} the number of photons in each mode.

Relativistic Momentum

The relativistic momentum is given by

$$p = \frac{m_0 v}{\sqrt{1 - \frac{v^2}{c^2}}} = \gamma m_0 v$$

This is the ordinary definition of momentum with the mass replaced by the relativistic mass. In the above calculations, one of the ways of expressing mass and momentum is in terms of electron volts. It is typical in high energy physics, where relativistic quantities are encountered, to make use of the Einstein relationship to relate mass and momentum to energy. In relativistic mechanics, the quantity pc is often used in momentum discussions. It has the units of energy.

$$pc = \sqrt{E^2 - m_0^2 c^4}$$

For extreme relativistic velocities where $E >> m_0 c^2$ then $pc \approx E$

A useful application of the quantity pc is in the calculation of the velocity as a fraction of c.

$$\frac{v}{c} = \frac{pc}{E} \quad \text{and when} \quad v \Rightarrow c, \quad pc \Rightarrow E$$

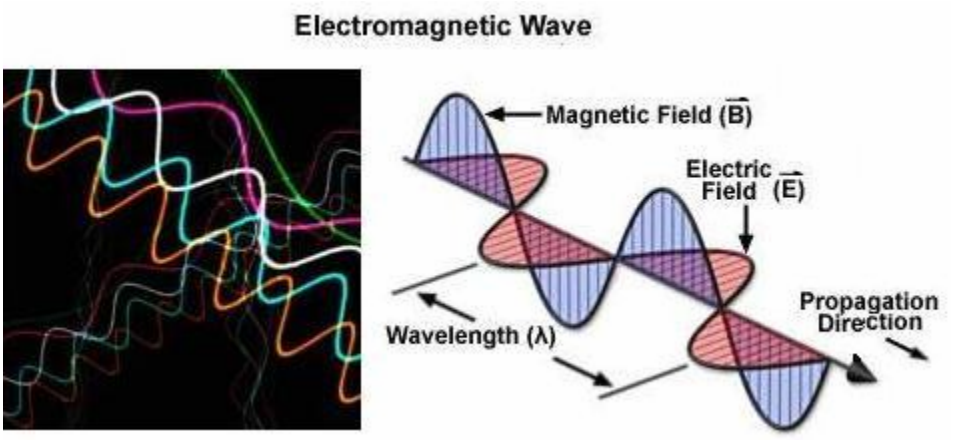
Exactly for photon v=c and pc=E

For limit of speed applies for the momentum of a photon.

A new look at electromagnetic waves

A photon becomes energy-laden by revolving. We know this because the electromagnetic fields around a "ray of light" are electromagnetic waves not static fields. Relativistic ally, the electromagnetic field generated by a photon is much stronger than the associated gravitational field. Further it is not clear at the present time whether the gravitational field of an energy-laden photon is static or oscillatory. It is not understood how the photon generates two sets of fields (electromagnetic and gravitational) of so different intensities. This is an enigma.

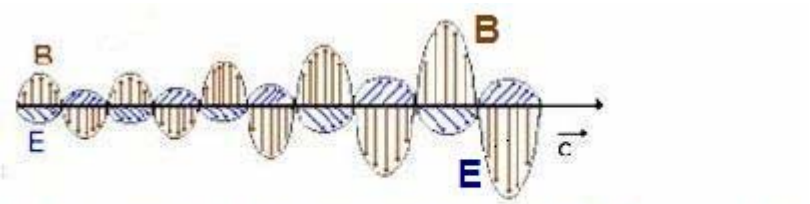
Let's take a new look at behavior of electromagnetic wave in a gravitational field; it can help for resolving this enigma. As we know an electromagnetic wave has form of two vertical electricity field and magnetic field (figure)



As General Relativity predicted and experiments show, the frequency of photons changes in a gravitational field. Remember Mossbuaer Effect. According Higgs boson what happens in this case?
By reconsider to these thee ideas, we are able take a different and new result.

1- **Energy of photon increases and according relativity mass-energy, its mass increases.**
2- **According Mossbuaer Effect and $W=\Delta mc^2$, when gravity force acts on photon, mass (energy) of photon increases.**
3- **Remember Higgs boson that How Particles Acquire Mass?**

4- A part of gravity work converts to electricity energy and other part of gravity work converts to magnetic energy.



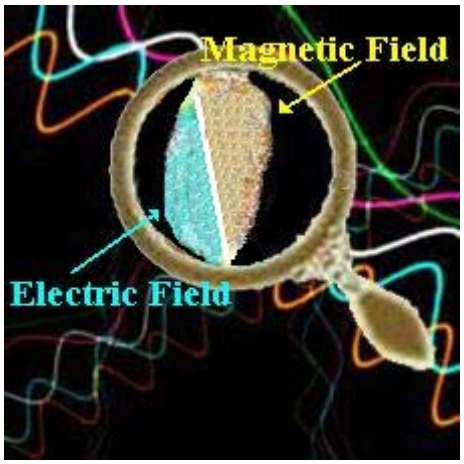
When a photon falls in a gravitational field, the strongly of magnetic field and electricity field increase.

According relations;

$$\nu' = \nu\left(1 \pm \frac{GM}{rc^2}\right) \text{ and } E=h\nu$$

Increasing and decreasing of photon's energy were doing part by part. And photon's energy comes of its electricity energy and magnetic energy, so in red-shift and blue-shift electricity and magnetic energy of photon do change. So, intensity of electricity field and magnetic field change by gravity effect.

Zoom on an electromagnetic wave. There are two electric field and magnetic field. These fields move with linear speed of c. But they have other motion that the paths of these motions are changeable.



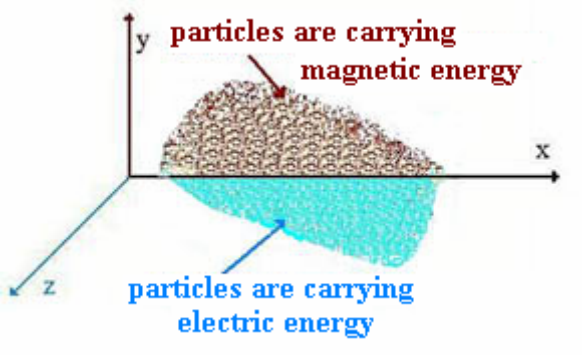
Do consider to top and down of wave.

Amount of seep is not stable.

Above picture shows the amount of wave speed on top is greater than down. Let's explain it more by combining relativity, quantum mechanics and Higgs ideas.

Is the speed of electric field and magnetic fields same as c?

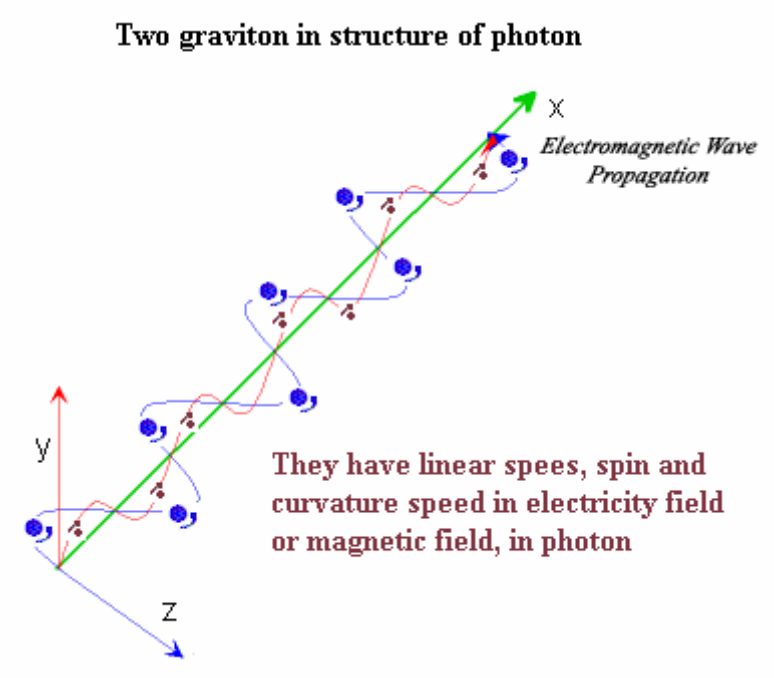
Again zoom on this part of electromagnetic wave on axis. But in this case take a new look by consider to Higgs ideas (following picture).



Suppose every field has formed of particles that they are moving. So, magnetic field contains many particles that they are carrying magnetic energy. And electric field has formed of articles that they are carrying electric energy, too. This looking is able give us very interesting conceptions about electromagnetic energy and how gravity affects on it.

New definition of graviton

According above explain take a look at photon that is falling in gravitation field. Gravity acts on it and the energy of photon (also, it's mass) increases. How we can explain this increasing of photon's energy by graviton theory? As we know gravity is a force and force is energy per distance, **F=-du/dx**. According Higgs conception, we can accept that graviton enters to structure of photon and during this action, a graviton disappears and the energy of photon increases. But graviton has spin and it cannot attaches to other particle that they have spin too. So, graviton keeps its spin and moves in structure of photon with the linear as speed of light (Following picture).



So, the amount of passing path per time is not equal c and it is greater than c.

But there appear a great problem in above explaining. Because lots gravitons enter to photon and the energy of photon increases, how we can explain the intensity of electricity and magnetic field of photon increases too?

It is a fact that the energy of photon increases in gravitational field and other fact is photon generates two sets of fields (electromagnetic and gravitational) of so different intensities. How we can explain theses facts about photon in gravitational field?

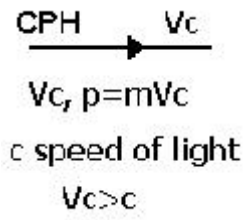
Our explain must be able to resolving two problems;

1- **When photon's energy increases in gravitational field, why and how the intensity of electricity and magnetic fields increase too?**
2- **Why the amount speed of electricity and magnetic fields that appear around photon on other axis are not constant?**

Now we are on a place that guesses some provable conceptions about photon and new definition of graviton. I will continue with definition of CPH and Principe of CPH and then return to above subject.

Definition of CPH

Suppose there is a particle with mass of m that is moving with speed **Vc** in an inertial reference frame. And **Vc>c** (c is the speed of light). So, CPH linear momentum gives with **p=mVc** (See Figure). It is Called CPH (Creation Particle Higgs). When CPH has spin, it calls **graviton**.



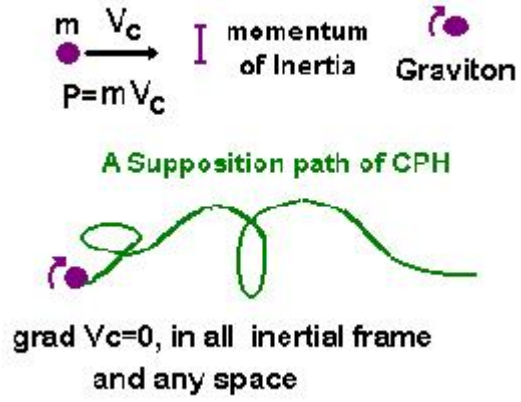
Principle of CPH

CPH is a particle with constant mass m and moves with constant amount of speed equal Vc. CPH has the momentum of Inertia **I**. In any interaction between CPH and other particles/masses/forces, the amount of Vc does not change, so;

gradVc=0 in all inertial* reference *frames and any space

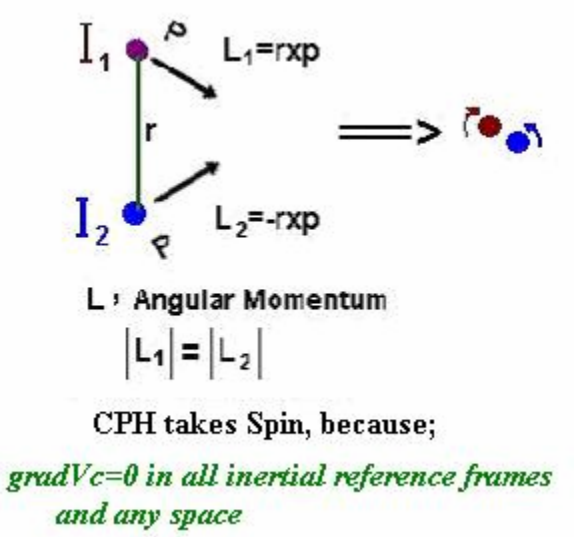
Explain

CPH carries linear momentum of P=mVc. So, CPH has inertia and also has Momentum Inertia I. When an external force is applied on a CPH, then a part of its linear momentum (P=mVc) converts to angular momentum and CPH takes Spin, so that the amount speed of CPH does not change in any case. When CPH has Spin, it is called GRAVITON (Following figure).



When gravity works on an object/particle, graviton does disappear and converts to energy. Because it is not acceptable that force acts and produces energy; and force does not have any effect on itself while producing energy.

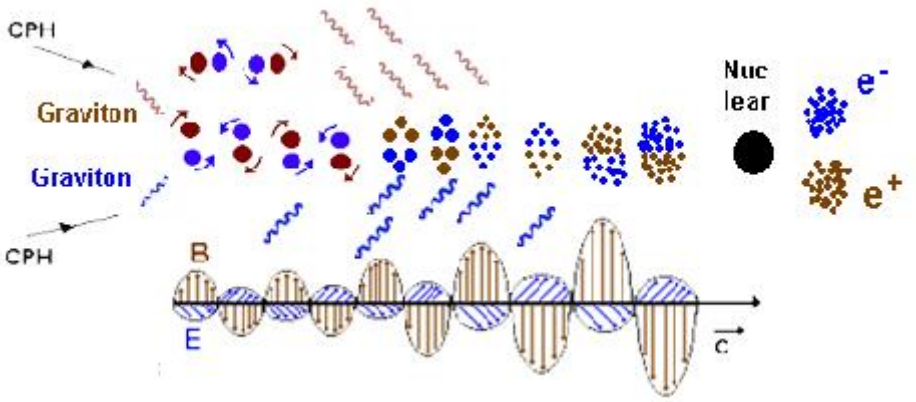
All efforts for finding a unified field theory had no success, because physicists do not consider the conversion of force and energy. Also, a graviton combines with another gravitons and produces energy (See Figure).



The picture above shows two CPH with the mass of m, speed of Vc and linear momentum of P=mVc, in distance of r feel each other (see color-charge and magnet-color item). They absorb each other and “r” decreases. But CPH must move with the amount speed of Vc, so they lose a part of their linear speed and takes Spin and graviton appears.

A Photon is formed by lots of CPH that they have spin and photon has spin too. So, when a photon is traveling with speed of c, CPH has linear speed of c and it has itself spin and a speed equal to the speed of the photon (according to the structure of photon).

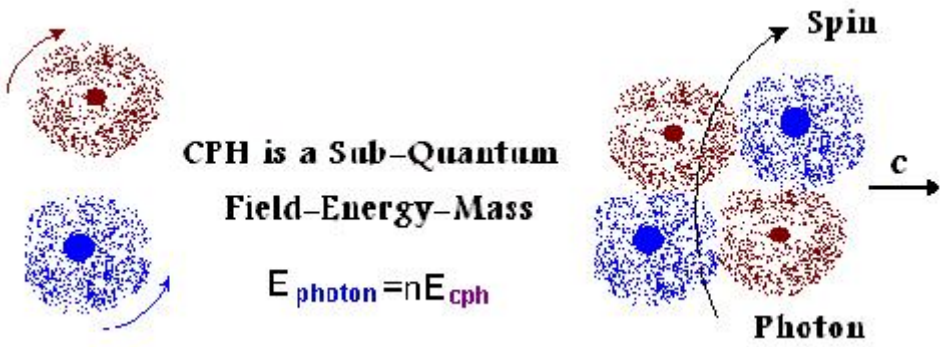
In a gravitational field, when a photon shifts to blue, gravitons convert to energy. And when the photon shifts to red, energy converts to graviton. And when energy decays, it produces Matter and Anti-Matter. See Figure. In fact every thing formed of CPH.



Color charge and magnet color

A photon becomes energy-laden by revolving. We know this because the electromagnetic fields around a "ray of electromagnetic" are electromagnetic waves not static fields.

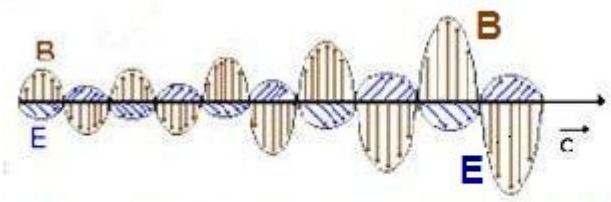
Let's return to at behavior of electromagnetic wave in a gravitational field again; it can help for resolving this enigma. As we know an electromagnetic wave has form of 2 vertical electricity field and magnetic field.



Suppose a photon is falling in a gravitational field, its frequency increases.
What happens in this case?
When gravity acts on a photon, according relation:

$$W=\Delta E=\Delta mc^2$$

a part of gravity work converts to electricity energy and other part of gravity work converts to magnetic energy (see figure).

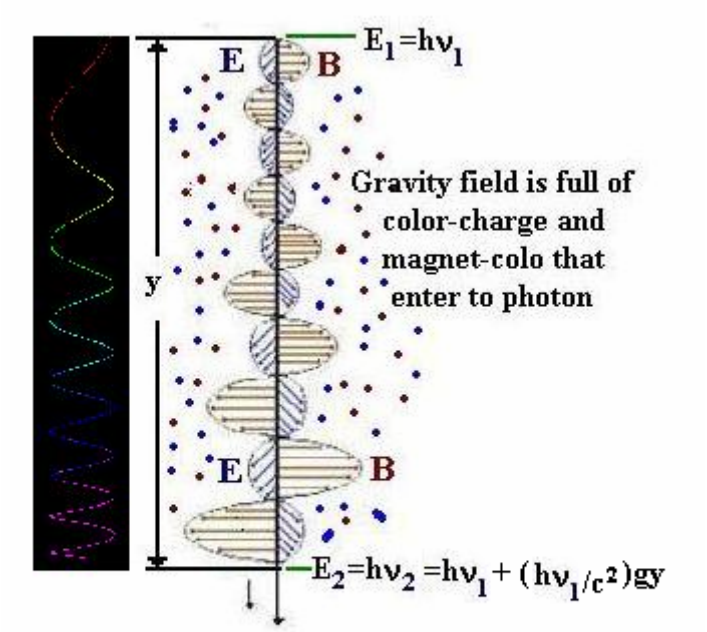


When a photon falls in a gravitational field, the strongly of magnetic field and electricity field increase.

There is no any explain about this phenomenon in theoretical physics. But CPH Theory explains it very simply.

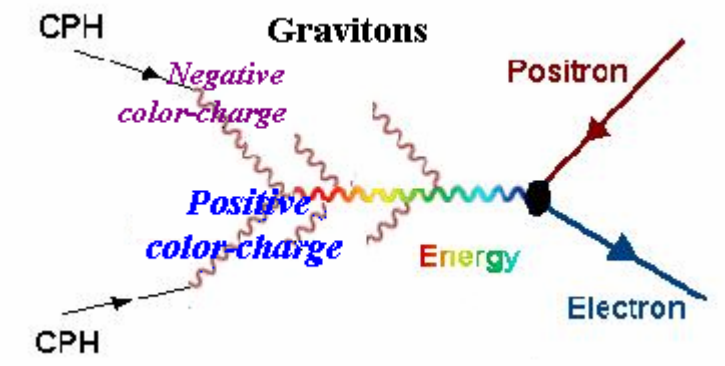
Color charge and color magnet

When a CPH feels other CPH, they take Spin and are called graviton. A graviton behaves like positive electricity charge and other one behaves like negative electricity charge (they annihilate each other), but they are moving and a CPH behaves like magnetic force, and two vertical electricity field and magnetic field do appear. It's acceptable because when photon is falling in gravitational field, the electricity field and magnetic field around it increase. Gravitational field has formed of gravitons. Gravitons enter into photon, the electricity and magnetic field increase, but photon has no electricity effect. So, there are two groups of particles that behave like charge and a group annihilates the effect of other group. But it depends to intensity gravity, for low intensity, gravity is not able to provide color-charge and magnetic-color for this projection (see picture).



When photon falls in gravitational field it's intensity of electric and magnetic fields increas.

According graviton has spin, so gravitons are color charge or color magnet.
A Photon is formed of lots CPH that they have spin and photon has spin too. So, when a photon is traveling with speed of c, CPH has linear speed of c and it keeps itself spin, and a speed on other axis (in electricity field on magnetic field, consider to properties of photon).
In a gravitational field, when a photon shifts to blue, gravitons convert to energy. In fact color-charge and magnetic-color enter into electricity and magnetic fields of photon. And when photon shifts to red, energy converts to graviton. Color-charge and magnetic-color of electricity and magnetic-color leave photon's structure. And when energy decays, it produces Matter and Anti-Matter. See Figure4. In fact every thing formed of CPH.



In fact a CPH is a sub-quantum of existence in nature. CPH has mass that is a manifest of matter; its movement is a manifest of energy. CPH has sub-quantum bounding Color charge or Color magnet field around itself.
A CPH feels another CPH, when they contact or they are very near (a distance like Plank Length that is equal $1.6x10^{-35}$ m). In this case their color charge/color magnet are able act on each other and do combine.

Photons (and all subatomic particles) are formed of many CPH that they have spin. So, CPH has many kinds movement. For example do consider to electron that moves on its orbit in an Iron atom in car. CPH has these movements, itself Spin, spin of electron, on orbit of electron, speed of car and so on. So that;

gradVc=0 in all inertial* reference *frames and any space

Any changing of CPH's movement is changing of its transfer movement to spin or spin to transfer movement. And according CPH has a constant mass of m, so its energy is being stable too.

Gravity
According TO CPH Theory, gravity is a currency among objects. For example consider the interaction between the earth and the moon:
Earth has a gravitational field. The gravitational field is formed by gravitons that are moving toward the earth and they are interacting with each other. Suppose the earth is alone and there are no interactions between earth and other bodies in universe. When gravitons (in fact color charge) reach the earth, the earth absorbs them. Look at a positive color-charge that reaches to an atom on the earth. Its effect is positive charge, so absorb with an electron. This positive color charge is not able annihilates the electron's charge, and does disarrange the conserving of electron's charge. So, electron excretes positive color-charge. But positive color charge has positive effect charge and pulls the electron behind of it (see section 4 Analyses of CPH Theory.) toward the moon. Also when a graviton reaches the moon, the same projection happens on the moon. So, every thing is bombarded by gravitons continuously.

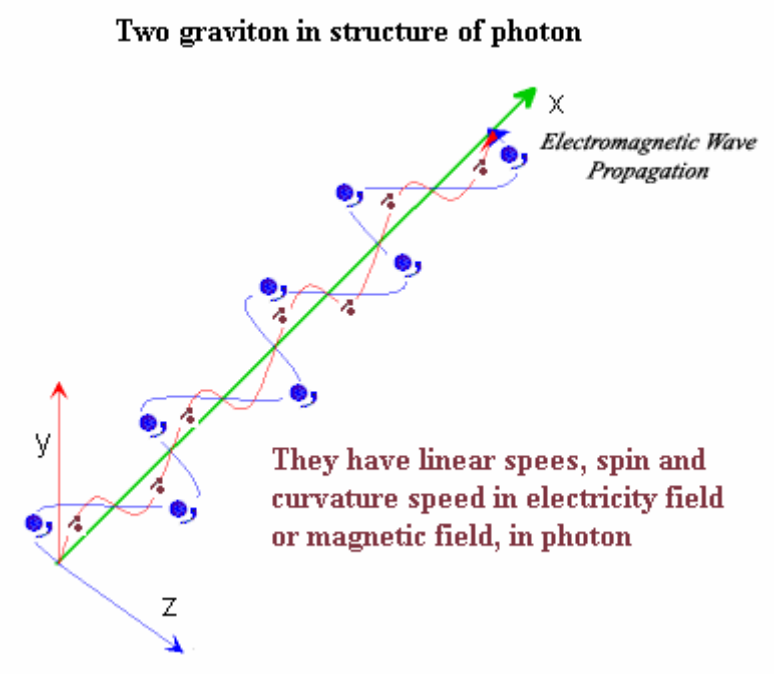
Color charge and magnet color equations

Suppose a CPH enter to photon. According **gradVc=0**, it has spin,
We can write;

$$\text{gradVc}=0 \rightarrow a_x\mathbf{i}+a_y\mathbf{j}+a_z\mathbf{k}=0,$$

Which a_x is accelerating on x axis, a_y is accelerating on y axis, a_z is accelerating on z axis and **i, j** and **k** are unit vectors.

Suppose it transfers on x axis, but in an electromagnetic wave, v_x is constant and equal c, in an inertia frame (see following Figure).
So, its speed changes on y and z axis only, because $a_x=0$ and $a_y+a_z=0$. when $a_y=0$, then a_z is maximum. And when a_y is maximum, then $a_z=0$.



One CPH is color charge. Suppose it is accelerating on z axis, and we can show its moving with a wave function as;

$$Ec=EcmCos\omega(t-x/c),$$

Ec stand of color charge and Ecm is its maximum amount of color charge. Because there is a relationship between its spin and speed on z axis. Remember its $v_x=c, v_y=0$ (in structure of photon), and v_z is changeable, only.
When spin of color charge increases, v_z decreases. If it is negative color-charge, there is a positive color-charge that behavior same as negative color-charge.
For magnet-color we can show it is moving with a wave function too;

$$Bc=BcmCos\omega(t-x/c),$$

Bc stand of magnet-color and Bcm is its maximum amount of color magnet-color. Also, there is a relationship between its spin and speed on y axis. Remember its $v_x=c, v_z=0$ (in structure of photon), and v_z is changeable, only.

Color-charge and magnet-color in usual form

The number color-charge in a photon is even, because half of it is for negative color-charges, and other half is positive color-charges. Also, according $E=cB$, so, we can write;

$$E=nEcmCos\omega(t-x/c)$$
$$B=mBcmCos\omega(t-x/c)$$

Which n is an even number and $m=n/2c$.
When a photon is falling in a gravitational field, n increases. So, the amount of E and B increase too. It means a lot of CPH enter to structure of photon.

Electricity Alfa Number

The importance of the number 137 is that it is related to the so-called 'fine-structure constant' of quantum electrodynamics. This derived quantity is given by combining several fundamental constants of nature:

$$\alpha = \frac{e^2}{4\pi\varepsilon_0 \hbar c} = 1/137.035$$

Where e is the charge on the electron, c is the speed of light, h-bar is Planck's constant and the epsilon represents the permittivity of free space. Despite the fact that each of these constants has their own dimensions, the fine-structure constant is completely dimensionless!

The importance of the constant is that it measures the strength of the electromagnetic interaction. It is precisely because the constant is so small (i.e. 1/137 as opposed to 1/3 or 5 or 100...) that quantum electrodynamics (QED) works so amazingly well as a quantum theory of electromagnetism. It means that when we go to calculate simple processes, such as two electrons scattering off one another through the exchange of photons, we only need to consider the simple case of one photon exchange -- every additional photon you consider is less important by a factor of 1/137. This is why theorists have been so successful at making incredibly accurate predictions using QED. By contrast, the equivalent 'fine-structure' constant for this theory of strong interactions (quantum chromodynamics or QCD) is just about 1 at laboratory energy scales. This makes calculating things in QCD much, much more involved.

It is worth noting that the fine-structure 'constant' isn't really a constant. The effective electric charge of the electron actually varies slightly with energy so the constant changes a bit depending on the energy scale at which you perform your experiment. For example, 1/137 is its value when you do an experiment at very low energies (like Millikan's oil drop experiment) but for experiments at large particle-accelerator energies its value grows to 1/128.

Gravity Alfa Number

As have explained before gravitons behave like charge effect and they named color-charge (or magnet-color). So, color-charge we are able choice a Gravity Alfa Number for the exchange gravity particle.
For that we do consider to relative electricity force and gravity force between two electrons in a stable distance equal r, which are

$$Fe=\frac{e^2}{4\pi\varepsilon_0 r^2} \quad \text{and} \quad Fg=\frac{Gm^2}{r^2}, \text{ m, electron rest mass}$$

$$\alpha_g=\alpha\frac{Fg}{Fe}=\frac{e^2}{4\pi\varepsilon_0\hbar c}\cdot\frac{Gm^2}{4\pi\varepsilon_0 e^2}=\frac{Gm^2}{16\pi^2\varepsilon_0^2\hbar c}$$

Gravity Alfa has no dimension.

How a charge particle emits electromagnetic wave?

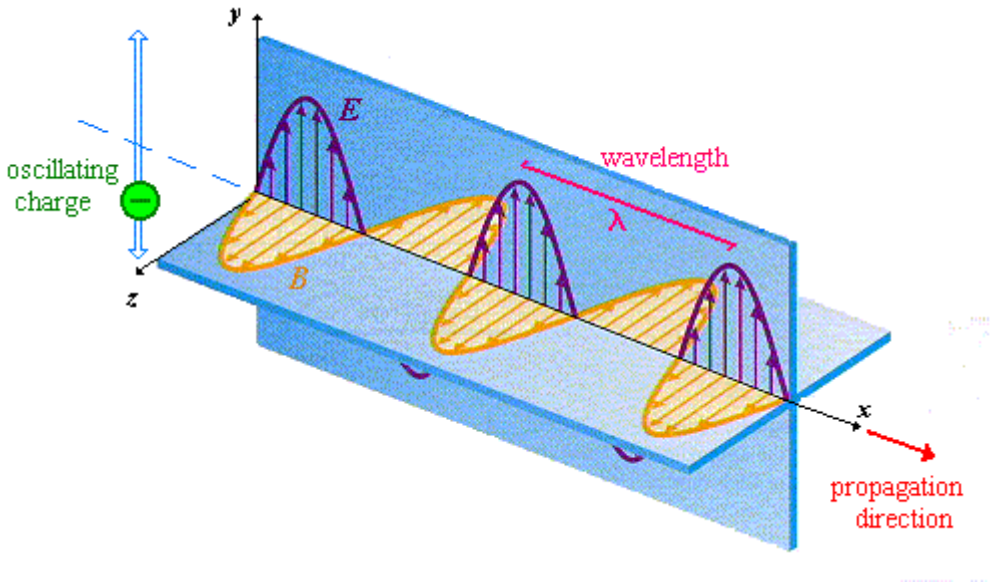
As we know when a charge particle oscillates, it emits electromagnetic energy. In usual case, when a particle charge accelerates, it emits electromagnetic energy.
Whine a force works on an electron (if W>0);

$$W=dE=\Delta mc^2$$

$$\mathbf{W_{(on\ electron\ or\ proton)}=E}$$

$$\mathbf{W=0 \rightarrow E=0}$$

Lots of CPH enter in structure of electron. In fact force converts into energy, or bosons convert into energy (Following Figure).



But a charge particle will keep its inherent charge properties. A charge particle (as an electron) is formed of Color Charges only and electromagnetic energy is formed of two different objects, color charge and color magnet. So it emits energy.
It shows why electron does not fall in nuclear.
For charge falling in earth gravitational field, look at

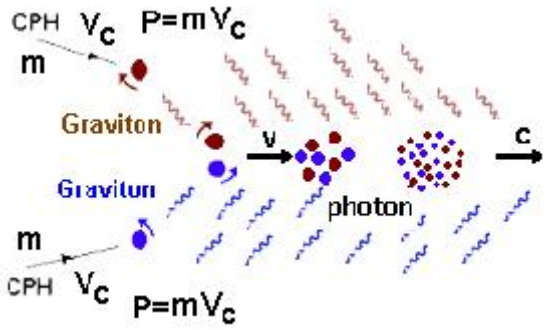
$$W=mgy$$

According the mass of charge particle and comparing with an oscillating in electricity field, and entering two couples positive and negative color-charge to structure of charge particle, appearing of emitting were so hard.

How Space-Time produces energy?

Quantum energy is formed by a lot of CPH. Also, CPH (graviton) works on CPH and produces energy.

It happens when the density of the graviton is high (Following picture).According to the size of a gamma photon and the number of CPH in it, we can calculate the density of CPH in the structure of the photon. The diameter of an electron is less than 10^{-18} m. A gamma photon (in pair production) produces an electron and a positron. Suppose the volume of a photon is 2 times of electron's volume.



Suppose that the density of CPH in structure of photon is $De(cph)=n \text{ per } m^3$,

Space is full of gravitons. Gravitons have interaction among each other. Cause, gravitons are two opposites charge (they are color charge). They absorb each other and convert to electromagnetic wave. When they convert to energy, that density of CPH reaches to

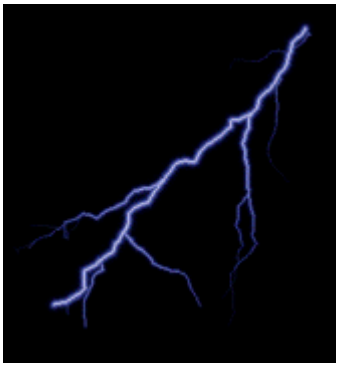
$$De(cph)=n \text{ per } m^3$$

So, for space we have;

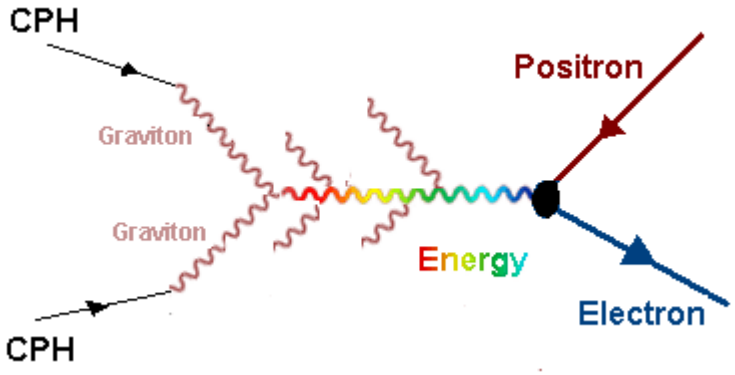
Integral on space of De(cph)=0 to De(cph)=n per m^3 on dDe(cph) = E , E is electromagnetic energy.

$$\int_{0}^{D(cph)=n \text{ per } m^3} dDe(cph) = E$$

Integration of gravitons is a projection to production electromagnetic energy.



This production happens in space that the intensity of gravity was being high like around a black hole. A gravity field high intensity of gravitons is able produces energy speedy and energy decay to matter and anti-matter speedy too (see following picture).

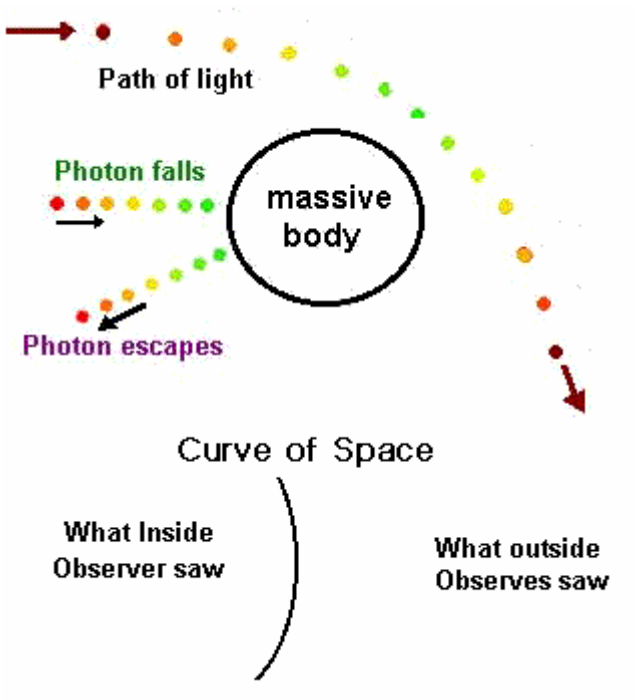


In high density graviton in space, force converts to energy.

And energy produces matter and anti-matter speedy.

CPH bends space

Now suppose light is moving in gravitational field of a massive body. Gravity works on it. When distance between photon and massive body goes to short, light shifts to blue like photon is falling. But when distance between photon and massive body goes to long, light shifts to red like photon escapes (Following Figure).

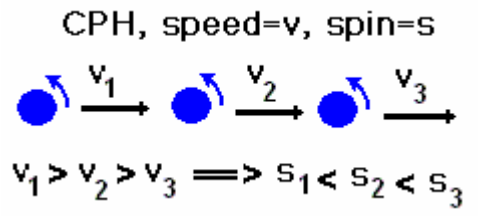


What the inside observer observes is the opposite of what the outside observer observes.

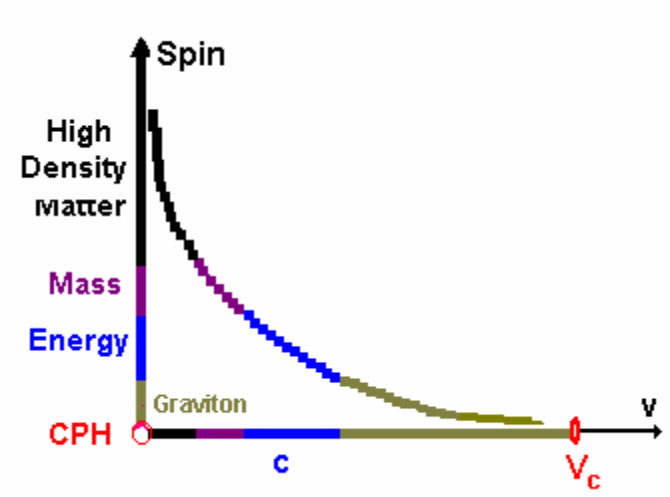
Limit of speed in universe and Spin

CPH moves with constant amount speed Vc. So, when its transfer speed decreases, then Spin of CPH increases (Figure), because;

GradVc=0, in all inertial frames and any space.



In other words, the Spin of CPH depends on the density of mass.
By the increase of the mass, spin increases too (Figure below).



Information about Big Bang and Inside of Black Hole

According to the Big Bang theory, the universe began about 14 billion years ago as an unimaginably hot and dense fog of light and exotic particles. The Universe has since continuously expanded and cooled. The whole Universe is bathed in the afterglow light from the Big Bang. The light that is now reaching us has been traveling for about 14 billion years, thus allowing us a look back through time to see the early Universe.
A looking at data of universe maybe help us resolves some universe mysteries.

Age of universe
Universe is 13.7 billion years old
$T=13.7x10^{12}$ years $=4.3x10^{20}$ s

Radius of universe
$R=1.6x10^{26}$ m

Volume of universe
$V=4/3\ \pi R^3$
$V=17.1x10^{78}m^3$

Density of universe
$D=10^{-18}$ kg/m^3

Mass of universe
M=(density)x(volume), so;
$M=DV=10^{-18}x17.1x10^{78}=17.1x10^{60}$ kg

And when universe collapses?

For a moment forgets accelerating universe and expanding universe.
Now suppose universe is collapsing.

What will happen exactly?
Oh, in this case;
All evidence shows universe is contracting. Of the first, stars light shift to blue. Distance between bodies decrease. So, distance between earth and moon decreases. Distance between earth and sun decreases too. Moon connects to earth, then earth and other planets fall to sun.
The strength of gravity increases. Sun swallows everything around it. Sun and nearest star to it (Alpha Centauri) absorb each other.
Distance between bodies decrease speedy. The volume of universe decreases. Intensity of gravity increases and pressure of gravity increases too.
What happens for atoms?
The radiuses of atom's orbits do decrease. Then electrons fall into nuclear.
Density of matter increases so speedy. So, there is nuclear only.
Also, maybe the volume of nuclear decreases, but there is no experiment shows it. So, let continue with using the density of nuclear.
Density of nuclear is $=2x10^{17}$ kg/m^3.
So, suppose universe collapses completely.
Then, according mass of universe and density of nuclear we can calculate volume V_0 of universe.

$V_0=M/D=17.1x10^{60}$ kg/$2x10^{17}$ kg/m$^3=8.5x10^{43}$ m^3

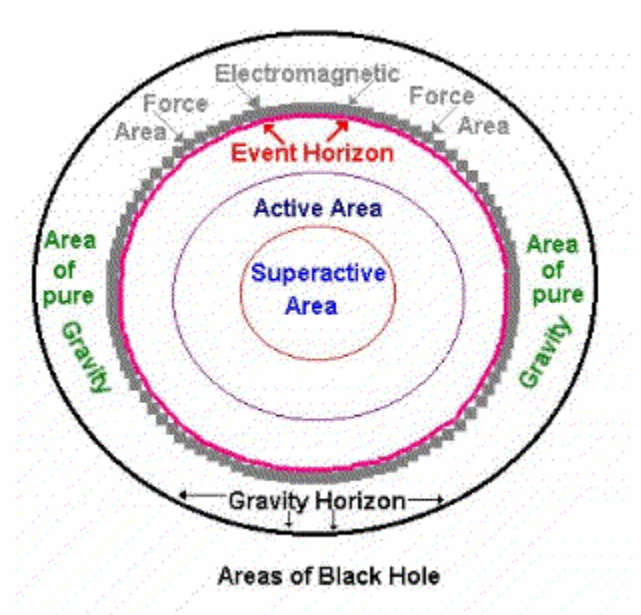
Then we can calculate R_0, radius of universe when it collapses completely. We will have;
$R_0=2.7x10^{14}$ m
It is an absolute black hole.

Absolute Black holes

A massive body first eats matter, then eats light (it is a block hole), and the end eats gravity. It is an absolute black hole.
According to CPH Theory every thing is formed by CPH and nucleus is formed by CPH too. CPHs are moving with a spin near each other in structure of nucleus. CPH has Spin and transferring movement so its amount speed is constant and equals Vc. so that;

graVc=0 in all inertia frame and any space.

Hence, a CPH has a transferring speed of v and spin of s. When v goes to zero, s goes to maximum.
When the pressure of gravity increases so much, distances between CPHs decreases.
No object, no light and no other electromagnetic waves and gravity effect are able escape of it (Figure below).



There is the straight velocity of CPH so much near to zero. Big Bang happened in a black hole as strong as this.
According to the following equation, we can result in a good conception about Big Bang.

$$\frac{\partial V_c}{\partial x}\frac{dx}{dt}+\frac{\partial V_c}{\partial y}\frac{dy}{dt}+\frac{\partial V_c}{\partial z}\frac{dz}{dt}=0$$

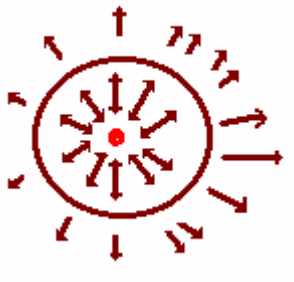
Big Bang Equation

Suppose the intensity of gravity is so much that Vc of CPH changes to its spin on the surface of an absolute black hole.
Then CPHs don't obey the external forces and the absolute black hole explodes.

$$\frac{\partial V_c}{\partial x}\frac{dx}{dt}=\frac{\partial V_c}{\partial y}\frac{dy}{dt}=\frac{\partial V_c}{\partial z}\frac{dz}{dt}\longrightarrow 0 \quad \text{Big Bang Equation}$$

Of the first time CPHs with velocity of Vc go further and gravity effect distributes to all sides.
According to $Ro<<2.7x10^{14}$ m and the speed of CPH, of the first universe expands so much, but there isn't any matter or energy
There is CPHs only, which they move with the speed of Vc.

But CPH has interaction with each other (they are color-charges) and they absorb each other. CPH takes spin and the small quantum of energy starts to form.
There are CPHs with linear movement with speed of Vc, lots CPH with Spin and transferring movement, and electromagnetic waves.
This item takes a great time.
Gradually energy forms easily and rapidly. Lots of big quantum energies appear.
Look at the center of the universe before it explodes.
The center of absolute black hole is like great bodies. The pressure goes to zero in its center. So, when the universe explodes, its center is under such a great pressure from all sides. See figure below.



During the first second of universe's explosion, there are so many interactions in center of the universe.
So, lots of quantum of energy are formed there and convert to matter and anti matter.
Then, gradually dust and bodies appear.
By the expansion of the universe, the size of the atoms increases too.

AND THIS IS THE STORY OF OUR UNIVERSE.

With Best Regards
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References;

http://scienceworld.wolfram.com/
http://en.wikipedia.org/wiki/Graviton

http://www.newphysics2000.org/photon.htm

http://www.toequest.com/

http://www-groups.dcs.st-and.ac.uk