Universe & Anharmonic Oscillator & Singularity Avoidance Higgs

Subjects: Quantum Science & Technology

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The functioning of our universe and atomic is based on the oscillation of the particle itself and asymmetrically between matter and antimatter. This mechanism is a classical an-harmonic oscillator and uses a linear oscillation of the particle, where the energy can be represented by the graph of a potential well. In this potential well the alternation of energies ocurs between the kinetic energy and potential energy. This an-harmonic oscillation of the particle thus occurs through a gravitational oscillator (see "*hole through the Earth simple harmonic motion*"), followed by a singularity avoidance. Indeed the important kinetics of the particle leads to a singularity avoidance to pass over the supermassive black hole to plot the Higgs field/potential. The alternation of the particle at very high frequency generates by the principle of mass-energy equivalence in vacuum ($E=mc^2$) a mass flux expressed by the quantum fluctuation determined by a scalar energy density. This scalar density represents for example the dark matter and the residues of the latter in the quantum vacuum. However a vectorial interpretation of the particle is possible as soon as its oscillation through the oscillator is really minimized before becoming a mass-energy equivalence flux. That represent the elements related to Einstein's Stress Energy Tensor. Here is the one of interpretation of quantum mechanics in relation to relativistic physics.

Keywords: anharmonic oscillator ; singularity avoidance ; gravitational oscillator ; oscillating universe theory ; oscillating model ; cyclic model ; Higgs ; universe ; theory ; kartazion

1. Introduction

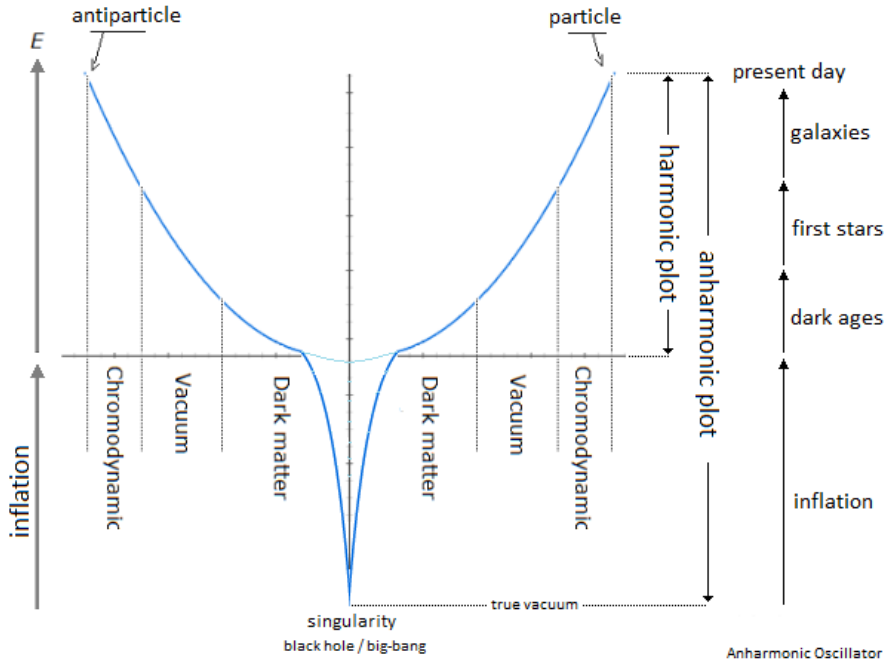

Figure 1. Once Upon a Time the Universe: Anharmonic Oscillator.

The theory and the thought experiment of this paper followed by the observations and calculations already acquired, can lead us to the following reasoning developed below. There are studied and under different interpretation, the mechanisms of the functioning of the an-harmonic oscillator. In addition and by observation a visual interpretation is deduced (**figure 2**). Indeed oscillating or alternating at the speed of light a 5mm particle from position A to position B spaced 10cm apart, would beseen as two visible points as a fixed and static appearance. The most important thing is to be able to mark a certain stop on each position of A and B, and to travel between them almost instantaneously.

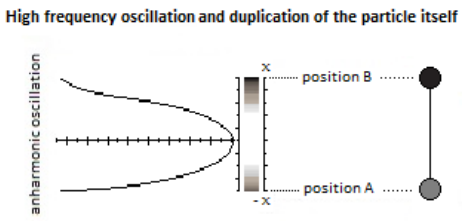

Figure 2. Duplication of the particle itself.

1.1. Background

The functioning of our universe and atomic is based on the oscillation of the particle itself [1][2]. This mechanism is a classical an-harmonic oscillator and uses a linear oscillation of the particle, where the energy can be represented by the graph of a potential well between Kinetic Energy and Potential Energy through a gravitational oscillator [3]. This an-harmonic oscillation of the particle thus occurs between matter and antimatter [4][5], followed by an avoidance of the gravitational singularity. This singularity avoidance [6][7][8] is of the supermassive black hole and/or big-bang type and is due to the high kinetics of the particle. On the other hand, and at total rest, this particle by its energy representation, is at the bottom of the potential well, at the lowest level, at the singularity, namely the total collapse of the universe which represents the state of true vacuum. But again, and through more sustained oscillation, a singularity avoidance occurs in contrast to the rest, and creates the levitation of the particle's energy to higher levels in its potential well. This singularity avoidance allows access to the current vacuum and is due to the kinetics and/or inertia of the particle. The role of the singularity in our model is fundamental and implies that it is the source and driver of the actual known result of quantum and cosmological fluctuations in relation to the motion of the particle. Indeed, the movement of the particle at very high frequency is interpreted by a flux expressed by the principle of mass-energy equivalence by scalar density. A representation related to Einstein's Stress Energy Tensor is then involved and also represent the mechanism of the cosmic inflation [9].

1.2. Harmonic Oscillator vs Anharmonic Oscillator

Harmonic Oscillator vs Anharmonic Oscillator. Indeed the difference is made here and is between the ideal harmonic layout and the absolut anharmonic layout of the energy captured in the potential well. In the case of singularity avoidance due to the high Kinetic Energy of the particle, cause that the plot of the curve of energy into the potential well tends towards a harmonic shape rather than an anharmonic one (**Figure 3)**. In contrast an oscillation of the low-kinetic particle taking one by one the steps of the energy levels will trace the anharmonicity of the singularity through the shape of the potential well due to the singularity/inflation, because more exhaustively we can still imply the internuclear distance and the morse potential to give this characteristic of anharmonicity to the oscillator. Another characteristic of anharmonicity to the oscillator is that of the variation in velocity of the particle and gives an exact representation of the scalar energy density along x-axis.

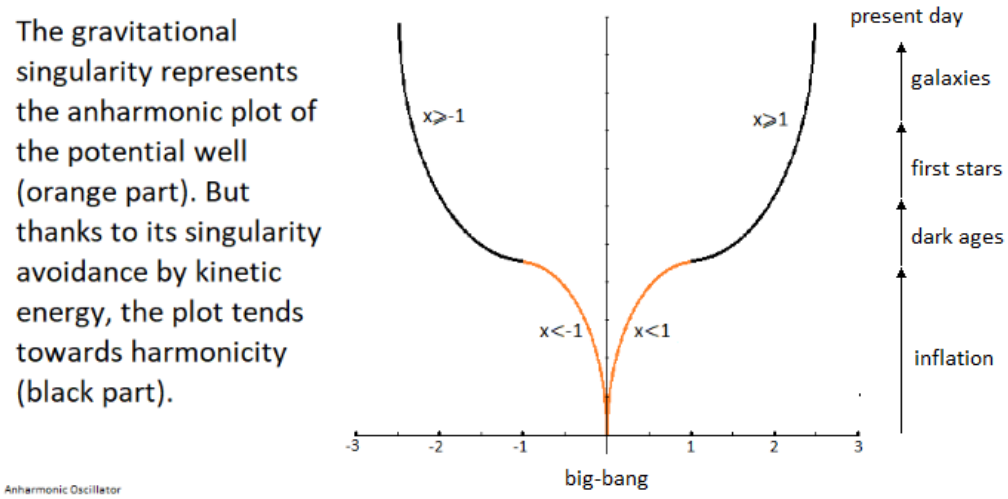

Figure 3. Graphical representation of the difference between harmonicity and anharmonicity.

In the following illustration **Figure 4** an integration of the gravitational singularity still disturbs the harmonic shape of the potential well. The greater the kinetics of the particle in its oscillation, the more the shape of the potential well tends towards harmony by avoidance of the gravitational singularity. But if the kinetics of the particle are stopped, then the

particle falls to the bottom of this gravitational singularity and traces the anharmonicity of the potential well. In the opposite case if the particle should to come out of its state of true vacuum to reach the higher energy levels, should correspond to the inflation for the universe and later that of the atom through another anharmonicity.

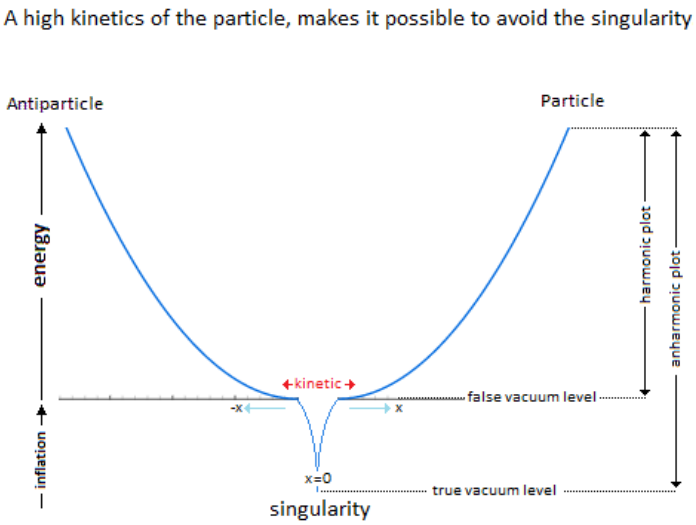

Figure 4. Singularity avoidance by the high kinetic energy of the particle.

In a second part of this introduction, it is question of the singularity avoidance where the particle by its path traces the Higgs field. The Potential Energy is related to the depth of the gravitational singularity, because to pass over a black hole would have for value an enormous Potential Energy, and would plot with the representation of the energy of the particle the curve of the Higgs potential/field.

2. Gravitational Oscillator & Ideal Distribution of Energies

2.1. Gravitational Oscillator

Perpetual motion is a utopia. But in our case it represents an oscillation without mechanical constraint followed by the principle and the law of conservation of energy. In an interpretation of classical mechanics, the an-harmonic oscillation of the particle can be represented through a gravitational oscillator (**Figure 5**). It is initially used gravity to subject by attraction a movement to the particle. Here it is question of an oscillation of the particle which uses the same direction as the gravity vector. The acquisition of kinetic energy through potential energy under vacuum condition allows endless oscillation of the particle motion as long as its cycle of oscillation returns to the original gravitational source to continue its next cycle. Its description is based on the "Hole Through the Earth Example Simple Harmonic Oscillator" [10][11] which does not really have an example in French but which is nevertheless well studied for its principle. Here is a summary explanation: "*If you drilled a hole in the axis of the Earth from pole to pole, and inserted a long, thin vacuum chamber into it, and then dropped an object into one end of that chamber, it would fall into the hole, picking up speed and it would move very fast when it reached the center of the Earth so it would continue until it reached the other pole where it would stop, then fall back "bounce" to come back and start again perpetually.*"

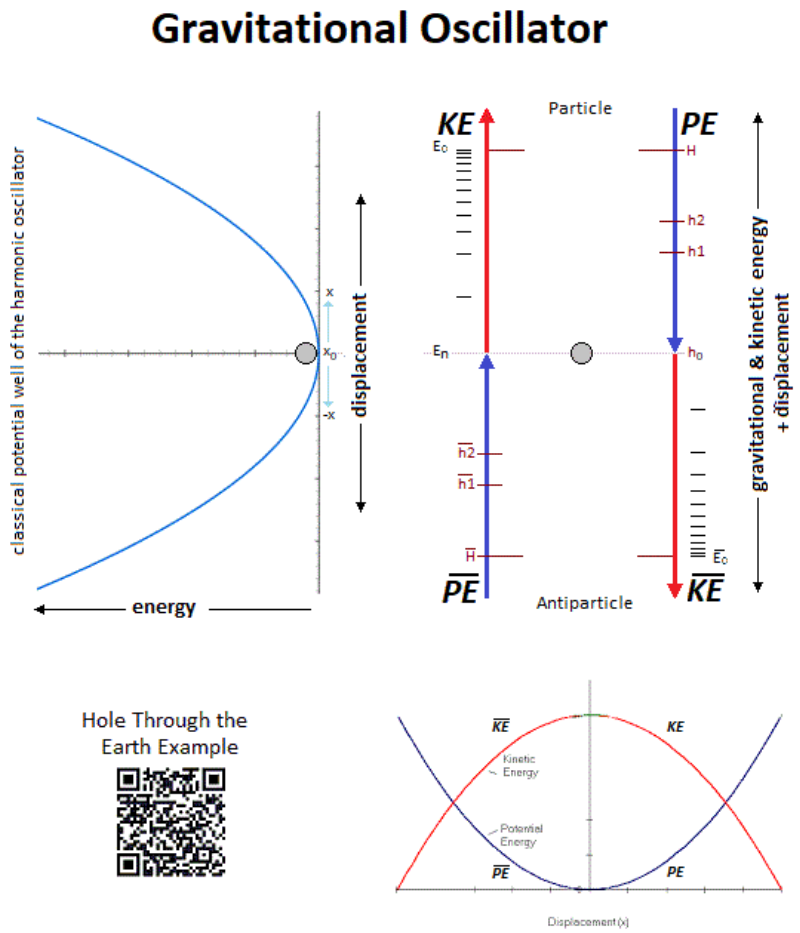

Figure 5. Gravitational oscillator and energy conservation between kinetic energy and potential energy SHO.

This linear gravitational oscillator in **Figure 5** uses a particle of mass m oscillating vertically along the gravity vector G. This oscillator reprensent an simple harmonic motion (SHO) and the oscillation has two phases. The first is the falling phase of the particle with its Potential Energy PE and the second is the reverse phase which corresponds to the Kinetic Energy KE. It is from the center of the Earth that what is in Potential Energy is transformed into Kinetic Energy and is reversed at the level at the point of origine *0* or *x=0.*

2.2. Kinetic Energy & Potential Energy

In conclusion, for the gravitational oscillator presented in **Figure 5**, use the distribution of the two energies follows the following **Figure 6** and operates according to the linear displacement of the particle, i.e. the alternation of the Potential Energy PE with the Kinetic Energy KE [12][13][14][15][16][17].

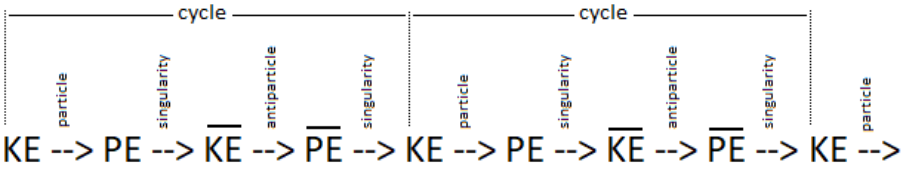

Figure 6. Oscillation cycle and alternation of Kinetic Energy and Potential Energy.

Potential Energy - Kinetic Energy = 0

2.3. Energy Path in the Potential Well

In the following illustration in **Figure 7**, the integration of the gravitational singularity is not represented.

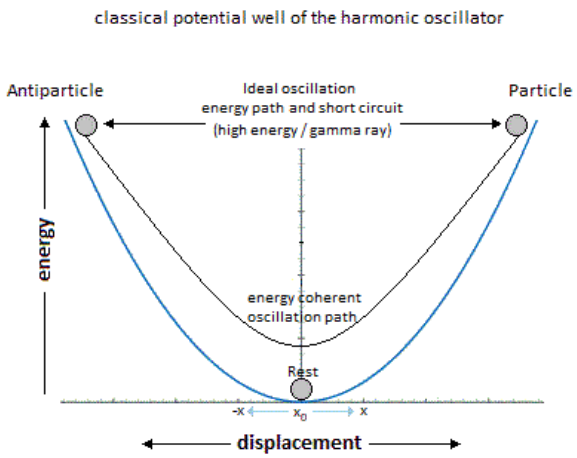

Figure 7. Potential well and energy path.

If the energy in the potential well in **Figure 7** has a curved shape, it represents the form of the amount of energy delivered to the particle according to x-axis. Which does not mean that the particle moves in a half-moon. The particle moves nice and well in a straight line in a radiative and linear way. In the **Figure 7** we can distinguish three types of possible interpretations of states or/and energy paths due to displacement of the particle. In 1 and at the bottom of the harmonic potential well at x=0, we have the rest of the motionless particle or the ZPE (the lowest possible energy in a quantum system [18][19]). In 2 and with the Kinetic Energy applied to the particle, is at x=0 the maximum speed of the particle and drawing an energy path in a form of harmonic curve. In 3 it should be noted that the ideal trajectory of the energy path is the short circuit type between matter and antimatter and would trace a straight line, namely the shortest energy path in the potential well. This utopian energy path is actually not the conventional form of energy delivered to the particle. However, the annihilation of the electron/positron pair into a gamma photon should indicate this short-circuit type trajectory, and finally defined the characteristic of a boson.

3. Source of Quantum Fluctuations & Gravitational Singularity

In our model the source [20] and the material existence as we know it, is based on the implication of the singularity of the big-bang type for the universe [21][22] and of the supermassive black hole type for the functioning for the galaxies [23][24][25] [26], and other theoretical singularity as like that of the center of an atom [27]. In other words, the divergent evolution of the volume of the singularity is responsible for the presence of the matter that remains in its space-time. As gravity (Potential Energy) attracts the particle towards the core of the singularity, and who approaches it to fall inside, is then deflected by a energy barrier or additional energy to that of the total energy accumulated emanating from that same singularity. Indeed the singularity generates in 1 the gravitational attraction noted Potential Energy PE. In 2 we have the emanation of the additional energy complementary to the total Kinetic Energy given by scattering and/or astrophysical relativistic jet or Hawking radiation from singularity [28]. Moreover in 3 it should be noted that the singularity generates eletric charges on the particle [29].

3.1. Speculative Singularity

In a more speculative and exotic definition and given our knowledge of the singularity in terms of gravitation followed by its ratio of time dilation, we could associate the center of the Earth as such. Indeed for the particle which oscillates in the radiative oscillation from the cente of the Earth to the surface and vice versa, it becomes easy to imagine a gravitational singularity at the level of the Earth's core in the same way as the supermassive black hole in relation to its galaxy [30][31].

4. Singularity Avoidance & Higgs Boson

4.1. Singularity Avoidance

Singularity avoidance [6][7][8] is due to the high Kinetic Energy of the particle. At x=0 when the particle is going as fast as possible, its Kinetic Energy allows it not to fall at the bottom of the gravitational singularity **Figure 8**. Gravity (Potential Energy) corresponds to the matter attracted towards this singularity with the Kinetic Energy accumulating through Potential Energy. In our case it is simply a particle rather than a cluster of matter.

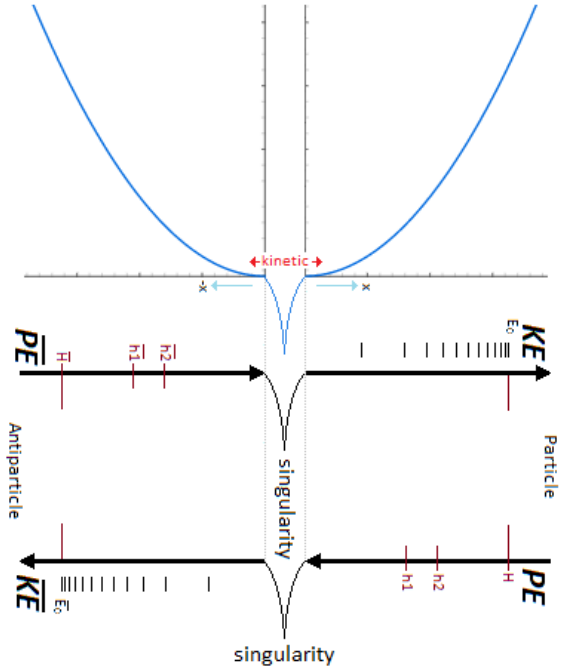

Figure 8. Gravitational oscillator and singularity avoidance by high kinetic of the particle.

4.2. Singularity Avoidance through Higgs Boson

A significant kinetics of the particle makes it possible to avoid the singularity. The path takes above this singularity by the particle energy determines the plot of the Higgs potential/field **Figure 9**. Indeed a potential barrier makes it possible to the particle to step over the singularity where the particle by its motion forms a wave of barrier of potential. An example of singularity avoidance with the Higgs implication is already done by scalar field definition [32], whereas for information the definition of vector boson is equally interpreted with or without Higgs [33][34].

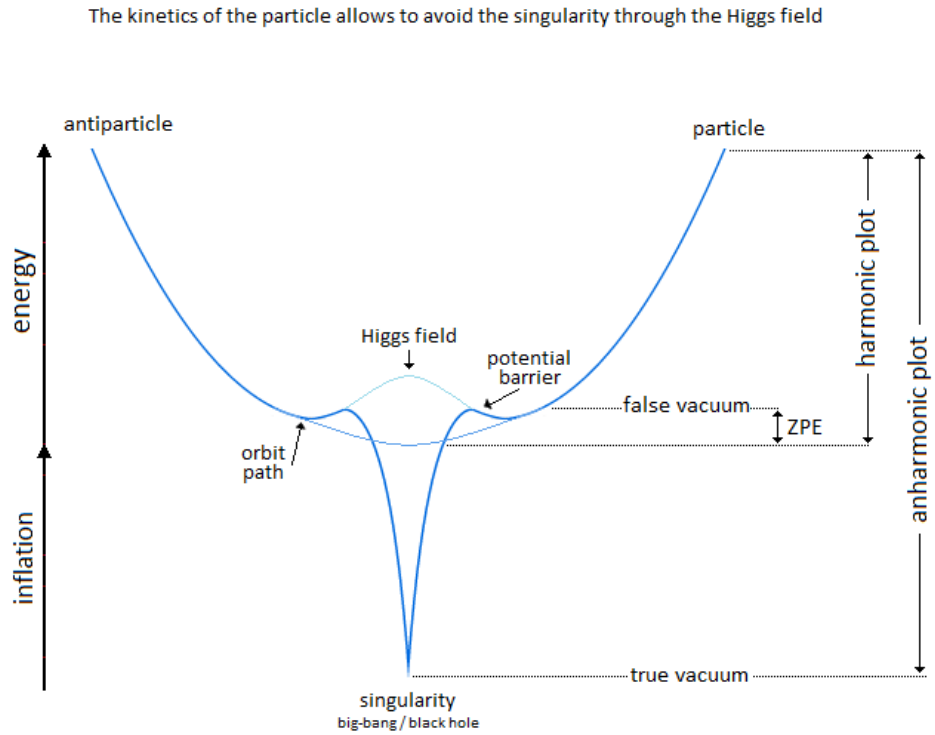

Figure 9. Gravitational oscillator and singularity avoidance through Higgs filed.

In a second time the theoretical junction between the singularity avoidance and the Higgs field can be done by the enormous Potential Energy. Indeed, the Potential Energy being that in relation to the depth of the gravitational singularity gives the particle a much greater mass, or even a maximum value.

Higgs field = gravitational singularity avoidance = enormous gravitational potential energy = mass link

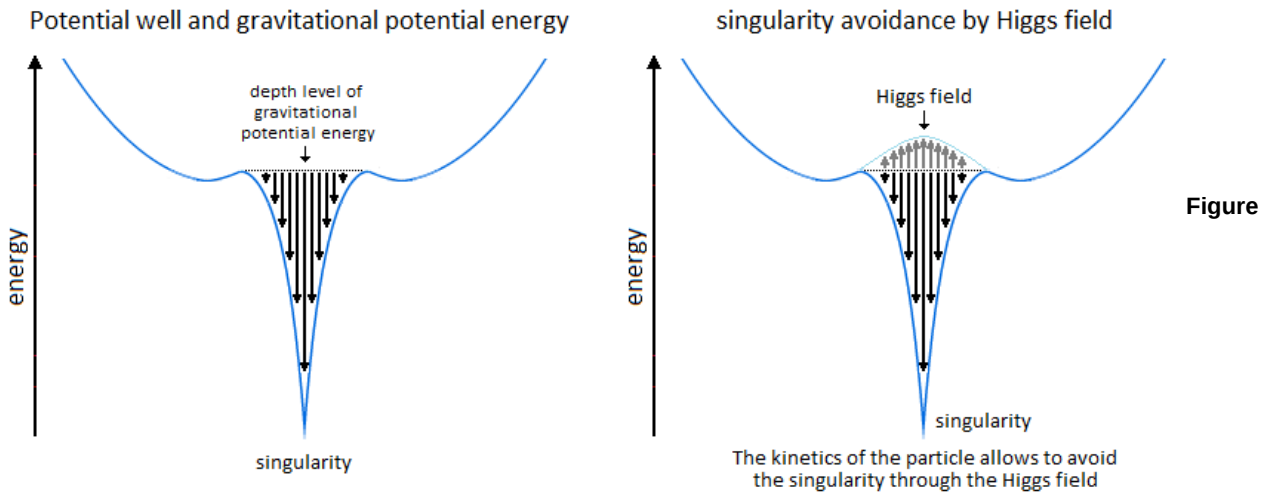

Figure 10. Potential Energy in relation to the depth of the gravitational singularity and the Higgs potential.

The Higgs field and its potential are also well used to be able to represent the vacuum metastability [35][36][37][38] of the total density of the universe, as well as its interpretation as a quantum particle for its origin from mass.

Singularity avoidance = enormous Potential Energy = Higgs mechanism = mass link

5. Orbit, Inertia, ZPE & Potential Barrier

5.1. Potential Barrier by the Massive Object

We indicate a potential barrier around gravitational singularities. This barrier is due to the deformation of the gravitational space-time curvature by a massive object. At least a difference in level where the Potential Energy is felt around the mass object. Without Kinetic Energy, the inertia of the object allows it to slide along the potential barrier that defines the path of the orbit around an even more massive object (geodesic and potential [39]). In other words, the deformation of the space-time curvature due to an average object is felt at the level of the heights of the energies, and creates a barrier arounfd it **Figure 11**. The distortion of space-time curvature is just as important for a star as some of the curves of a singularity.

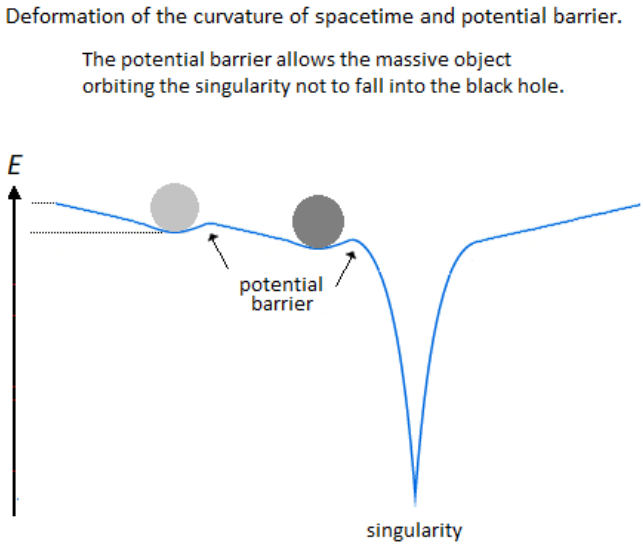

Figure 11. Singularity avoidance by inertia and orbit path (geodesic).

5.1. Potential Barrier by the Particle Motion

In the absence of mass by the massive object, it is energy which by substitution through the principle of equivalence deforms the curvature of space-time. During a high kinetics of the particle, the deformation is therefore felt on the space-time grid through the energy. Indeed through its displacement the particle/quanta/packet forms a wave of barrier of

potential which follows it until the singularity annihilates it in its surroundings; that whereas when the particle by its kinetics continues its trajectory to avoid this singularity.

5.2. The Zero Point Energy

The ZPE (Zero Point Energy) represents the initial perturbation of the particle at rest. At the quantum level this means that when the particle is at rest at the bottom of the harmonic potential well, the particle undergoes an oscillating disturbance. In cosmology this disturbance represents the inertial movement as an object orbiting around the gravitational singularity/massive object. In other words, the initial quantum disturbance of the Zero Point Energy corresponds to the cosmological movement of the object/particle located in the false vacuum in orbit around the gravitational singularity [40]. Deformation also occurs for massive objects like stars.

6. Vacuum Metastability

6.1. Vacuum Metastability

Vacuum metastability is determined by the amount of Kinetic Energy applied to the particle to trace its potential field in relation to the total energy density of the universe. If the Kinetic Energy of the particle is sufficient within the range of the energy condition allows to pass over the potential barrier, then singularity avoidance occurs; But during an attenuation of the kinetics of the particle or even a total stop of the inertia, that will cause by its amount of lower energy its fall towards the singularity and will reach the true vacuum and corresponds to the total collapse of the universe. However the vacuum metastability is under review [41].

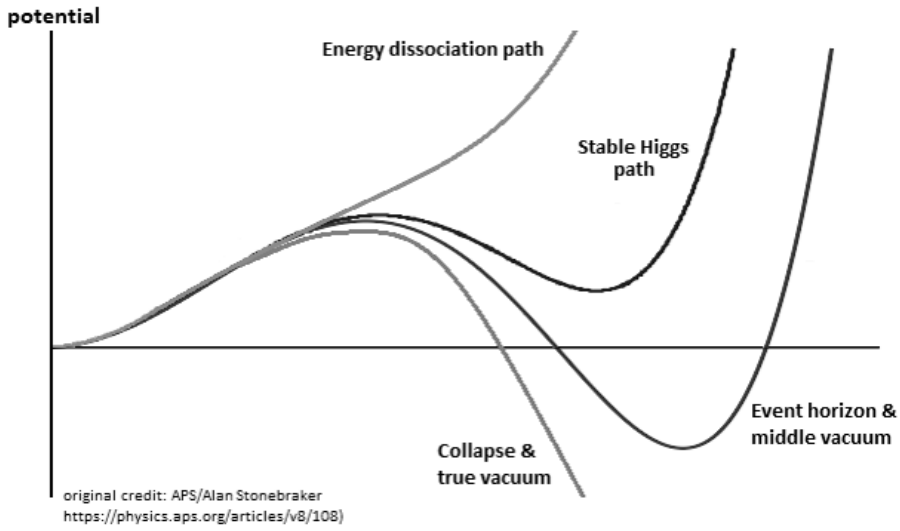

Figure 12. Potential of the vacuum metastability and the Higgs potential/field [42].

6.2. Tunnel Effect

In other words, the inertial disturbance of the ZPE of the particle makes it possible to remain in the false vacuum by inertia, until a fictitious drop in this energy slows it down and then causes it to fall through a virtual slit to reach the another/middle/true/ vacuum.

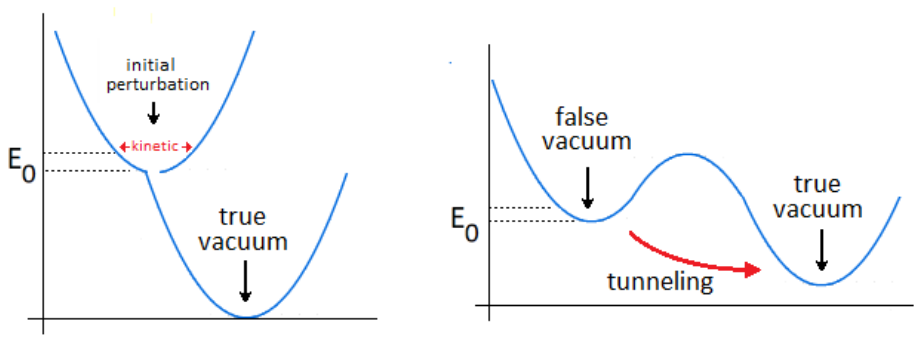

Figure 13. Tunnel Effect and virtual slit.

6.3. Bifurcation & Energy Dissociation

The energy applied to the particle which is at the bottom of the potential well in its state of true vacuum, should then be able to rise in higher energy levels through the anharmonicity of inflation. After acquiring enough energy and at the end of this inflation anharmonicity curve, energy dissociation [43][44][45] occurs and allows the energy of the particle to pass into the upper level of the well to trace its harmonicity, until the anharmonic meeting to represent the atom. ionic covalent bonding [46][47][48][49][50]. This cycle can then be applied without limit and rise from well to well in higher levels by the principle of energy dissociation **Figure 14**.

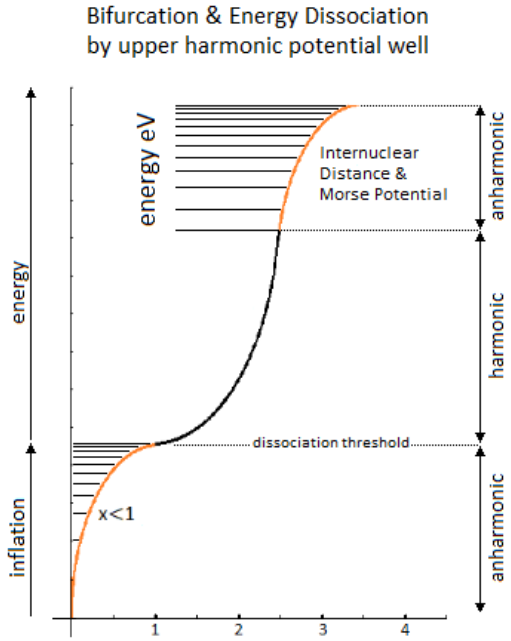

Figure 14. Bifurcation & Energy Dissociation by upper Potential Well & Internuclear Distance & Morse Potential & Ionic Bond.

Without any kinetic energy being subjected to the particle, it will take the path of total collapse through the virtual slit/slots. The kinetic energy helps avoid passing through the slit. Bifurcation in **Figure 15** is directly related to energy dissociation for each higher potential well level. A large amount of kinetic energy allows the particle to pass through the upper well by the energy dissociation.

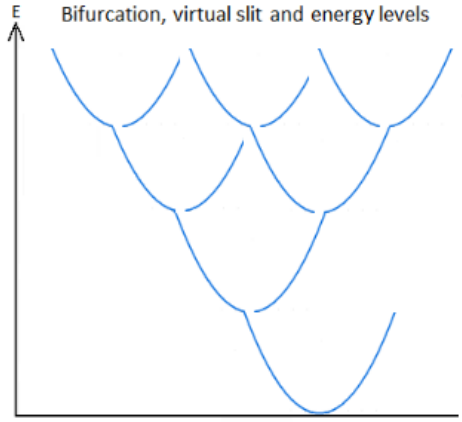

Figure 15. Bifurcation and virtual slit and level of energies. Energy dissociation to upper well [51].

7. Second Interpretation of Singularity Avoidance

It should be understood that in the event of a attempt to stop followed by slowing down of the kinetics of the particle due to the high potential barrier, the particle will then tend to pass through by the tunnel effect, instead of the singularity avoidance by the Higgs field and finds itself at the level of the black hole event horizon. This being said, this does not mean that the particle will finally reach true vacuum because the minimum kinetic/inertia was then send to the particle in order to be able to take the contuinity of its journey through the event horizon. This contrary scenario of the Kinetic Energy sent or subjected to the particle in order to be able to eject it again into the upper harmonic well of our vacuum, represent the singularity avoidance by the mechanism of Hawking radiation toward the upper harmonic energy well of our vacuum. This second Interpretation is to be considered as a singularity avoidance at the black hole event horizon (**Figure 16**) instead of the singularity avoidance over it by the Higgs field.

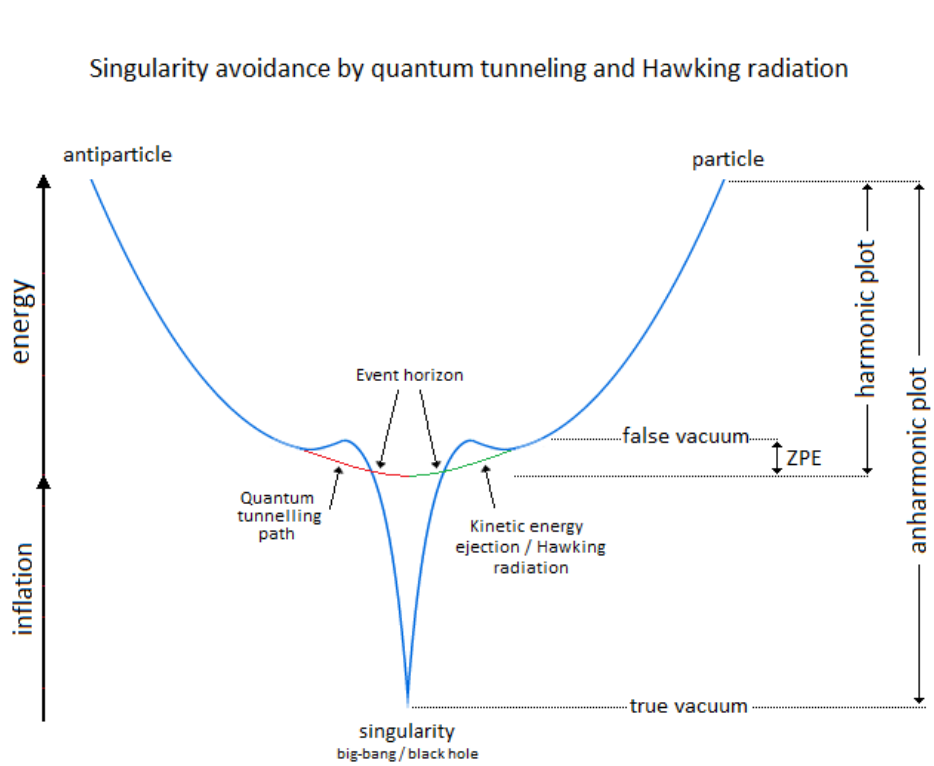

Figure 16. Singularity avoidance at the black hole event horizon by quantum tunneling and Hawking radiation.

8. Graviton & Potential Energy

In **Figure 17** and according to the units of Planck, the number and the quantity of gravitons put end to end (point to point) along the vector of gravity G, then gives the total of the energy of gravitational potential. Each increment/decrement of the graviton, is obtained by adding or subtracting a linear total of energy quanta. The graviton/quanta can be represented by the size of the particle. It becomes easy to take into account the number of gravitons accumulated over the length of a ray noted in nm where this ray is parallel to the length of the vector G in order to be able to have a relationship between the number of gravitons in relation to the Potential Energy [52][53].

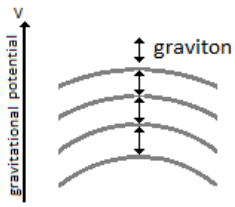

Figure 17. Relationship between number of gravitons in relation to the Potential Energy.

9. Asymmetry Matter Antimatter

Most important is the role and the why of antimatter. As we can see the gravitational oscillator looks like a balanced perpetual motion without mechanical constraints. It is precisely on this side of the balance without mechanical constraint of the oscillation, that it makes that between Kinetic Energy and gravitation (Potential Energy) that the role of the antimatter becomes important. This allows the particle to simply bounce (due to deceleration from depletion of the particle's Kinetic Energy) to turn around using Potential Energy. There is therefore no impact of the particle that occurs in its cycle of oscillation. The Dirac Sea is a perfect representation of what the electron becomes in the depths of energy. Dirac predicts antimatter and the positron [54]. We must therefore imply an anti-inflation followed by its anti-universe [55][56]. This therefore explains why we do not find the expected antimatter in the matter side of the universe, because antimatter is indeed found on the anti-universe side. In conclusion during a high energy collision, the annihilation of the pairs of particles make detect thanks to the gamma photon the presence of antimatter through the space-time.

10. Symmetry Breaking CP & Arrow of Time T

We understand that the symmetry breaking is located at x=0 at the level of the gravitational singularity. There is therefore a link between the Higgs potential and the symmetry breaking at x=0. If the charge and the parity CP are inter-changed following a linear movement of the particle either from bottom to top, then the arrow of time is perpendicular and flows for

example from left to right. Still based on the oscillation of the particle itself, its presence distribution through its momentum and its position according to x (displacement) is asymmetrically arranged between matter and antimatter [57]. Indeed the particle cannot be on matter and antimatter at the same time.

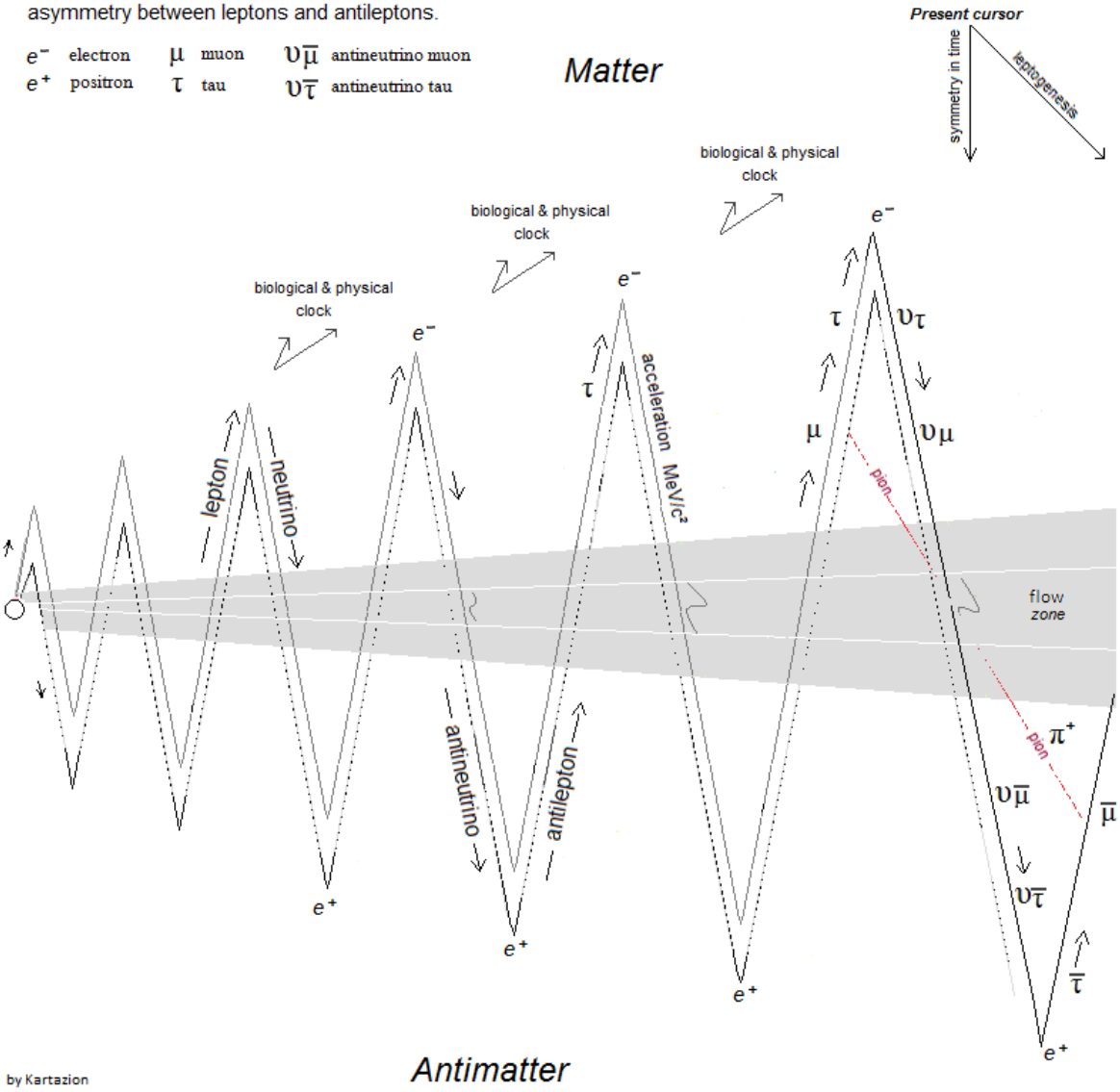

Figure 18. Asymmetry between leptons and antileptons, and leptogenesis.

11. Scalar & Vector Interpretation of the Particle

11.1. Invariant Transformation

Invariant transformation between vector and scalar interpretation of the mass-energy equivalence of the particle through the oscillator. The scalar interpretation of the particle represents the entropy of a very high frequency oscillation of it by its density occurring through the principle of mass-energy equivalence. But during a weak or almost non-existent oscillation, the particle is then represented by a vectorial position during its movement. For example, a point mass object in the space-time reference frame is then represented by an orbital state vector during its movement around a star (conventional interpretation). But in the same proportion the particle in its dizzying oscillation can only be detected and measured by its energy density, and depending on the type of anharmonic oscillation its flow of entropy of the particle can be represented by an point mass object through a static value by a scalar value **Figure 19**.

In conclusion, this leads to moving a scalar value of the same density vectorially. The goal being the invariance of mass-energy bound by the particle.

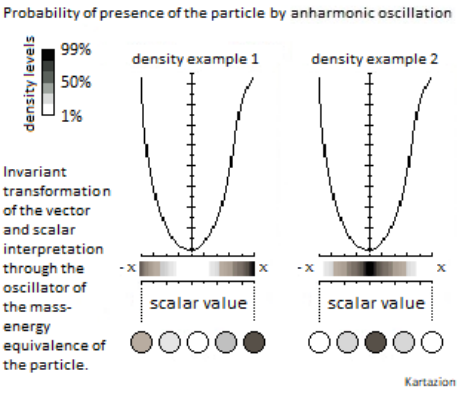

Figure 19. Anharmonic oscillation & probability of the Particle by scalar densiy.

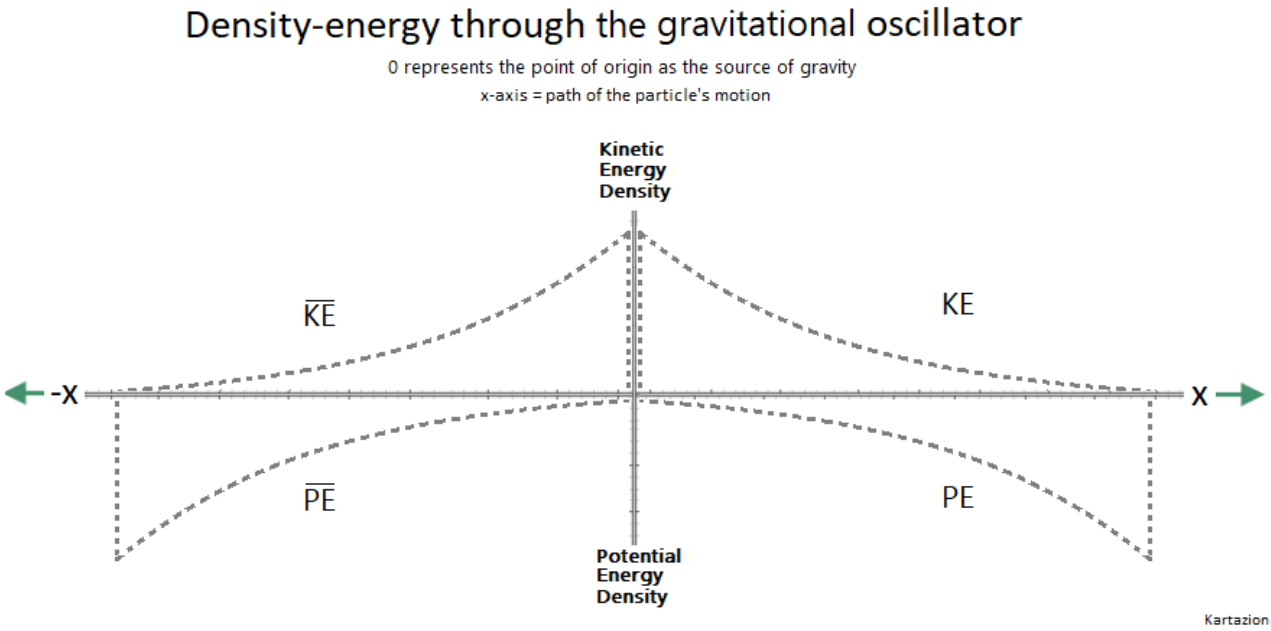

Figure 20. Scalar representation of the energy according to the position of the particle.

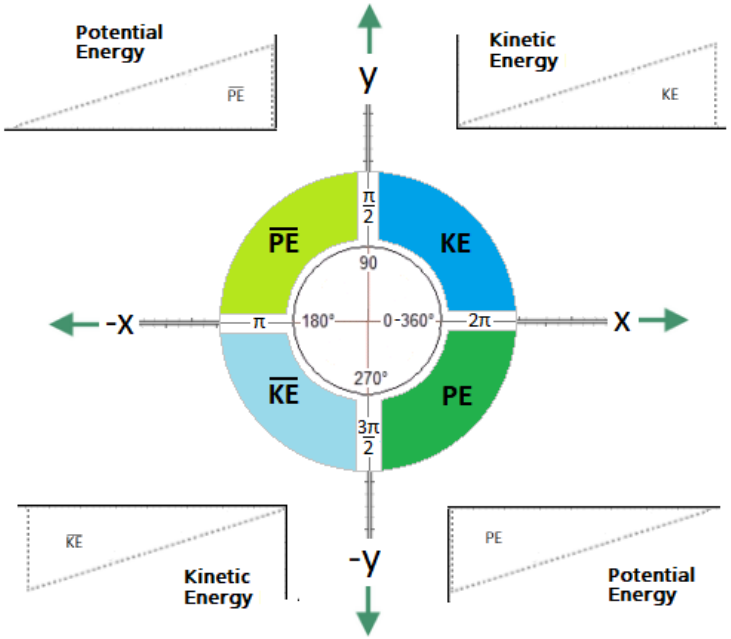

Figure 21.

11.2. Cosmic Inflation & Stress Energy Tensor

In an inverse configuration when the particle is at rest gives a description of the first step of inflation directly related to Einstein's Stress Energy Tensor or by the Klein-Gordon equation version of the energy-momentum as soon as an enormous momentum of the particle takes on a scalar definition through a flux. The flux represents the maximum amount of movement (momentum flux) through mass-energy equivalence (energy flux) during the start of inflation until its energy dissociation. Following the anharmonic inflation in space-time is therefore represented by the internuclear distance levels up to energy dissociation.

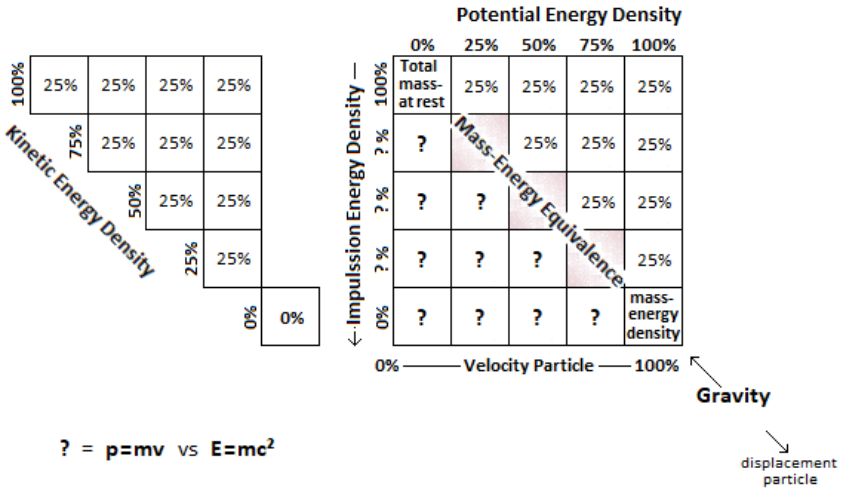

Figure 22. Tensor vs Matrix

12. Path of the Particle, Quantum Fluctuation & Dark Matter

Based on the functioning of the mechanism of the anharmonic oscillator, involves during the movement of the particle, to make it go through different physical stages due to its high speed of displacement between matter and antimatter. We can also talk about the particle's energy flow to express the different cosmological or quantum states observed (Kasimir effect, etc.) [58][59]. The path of the particle is therefore linear and forms round trips. The path of the particle is therefore radiative. When the particle reaches a sufficient speed, a transformation into mass energy by the equivalence principle occurs. A small trace of this energy is found in vacuum and represents quantum vacuum energy. The successive addition of vacuum energy gives dark matter. In other words, the convergence of the energy flow (quantum fluctuation) of the quantum vacuum, in a more restricted space, close to the singularity, then in turn becomes dark matter [60][61][62][63]. At its opposite and the opposite of the singularity, there is matter expressed by quantum chromodynamics. Dark matter and quantum vacuum energy/quantum fluctuation is produced with the condition of the particle moving at very high speeds. Indeed the low frequency of oscillation of the particle through the oscillator, allows a vectorial interpretation as a point particle, while the high frequency of the particle through the principle of mass-energy of equivalence disappears from its shape punctual and is interpreted by a scalar density. Here in **Figure 23** is an example of the absolute path taken by the particle.

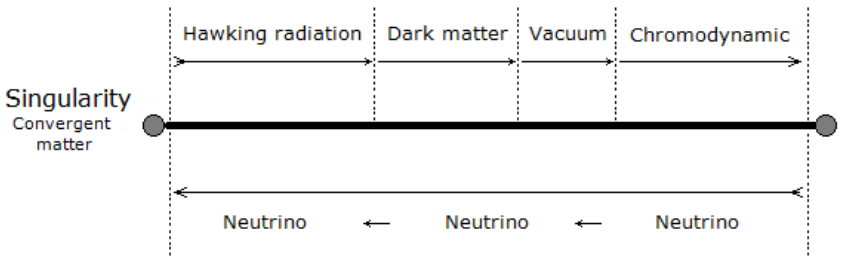

Figure 23. Absolute path taken by the particle through the oscillation.

Here in **Figure 24** is a simple potential well of energy to explain dark matter and quantum vacuum and quantum chromodynamics in relation to the oscillation of the particle:

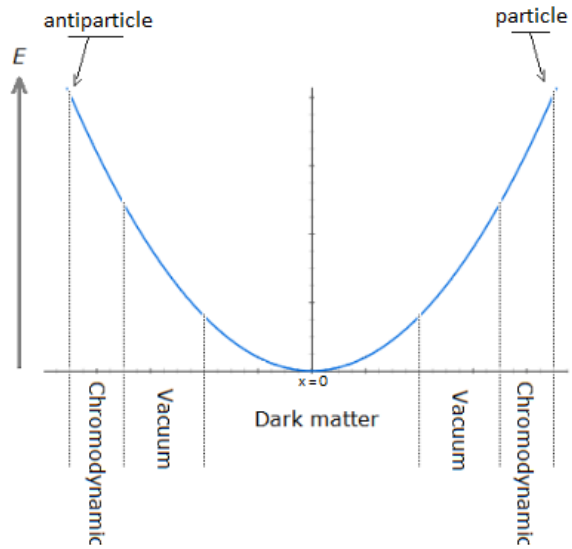

Figure 24. Explain dark matter and quantum vacuum and quantum chromodynamics in relation to the potential well of the simple harmonic oscillator (SHO).

13. Dark Energy

Dark energy corresponds to the increase in the size of the potential well. In the gravitational oscillator, the incrementation of the particle, that is to say a height of radiation greater than the previous height in the potential well, is produced by additional energy called dark energy; And which makes the particle advance further and further from its gravitational source. The example of a galaxy, where inside does not know an expansion of size in relation to its super massive black hole, uses a constant amount of Kinetic Energy in relation to gravity (Potential Energy). The increase in this Kinetic Energy that we have seen so far, then becomes dark energy, while it is only a amount of energy greater than the previous energy impulse. In other words, to move the particle further and further away from the singularity (i.e. big-bang) with the gravitational oscillator, more energy is needed. This extra amount of energy is dark energy [64][65][66].

14. Quantum Superposition

Schrödinger's Cat is a thought experiment that illustrates the result of the quantum superposition paradox. If the particle is on A, then it cannot be on B. But at very high frequencies the particle has almost a 50% chance of being on A and B at the same time, hence the superposition state. If you were to randomly choose a position between A and B, then you would either have the particle in the hand (alive) or no particle in the hand, hence the cat experiment. In prediction, the quantum superposition states is at least straddling matter and antimatter before being detected on the matter side [67][68][69].

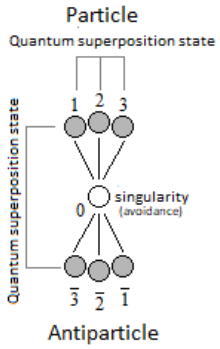

Figure 25. Combination of quantum superposition states.

15. Quantum ChromoDynamics

15.1. Coupling Constant & Asymptotic Freedom

Quantum ChromoDynamics (QCD) would only be a duplication of the particle itself. It describes the mechanics of the quark superposition transition. In other words, quantum chromodynamics is the alternation of the particle itself to form the different combinations of quarks. QCD is the oscillation of the field which interferes with the particle in its convergence of the position towards its point of oringne 0 [27] and relating to the coupling constant (gauge coupling parameter). On the other hand during the material divergence due to the corelation of the particle on the surface of the energy sea, separating

the quarks (which is only e.g. the alternating oscillation of the particle between 0 and 1 and 2 **Figure 26**) acts on the contrary of the coupling constant on asymptotic freedom [70][71][72][73][74][75]. It becomes obvious to make the link between entropy and plsma oscillation [76][77][78][79][80][81].

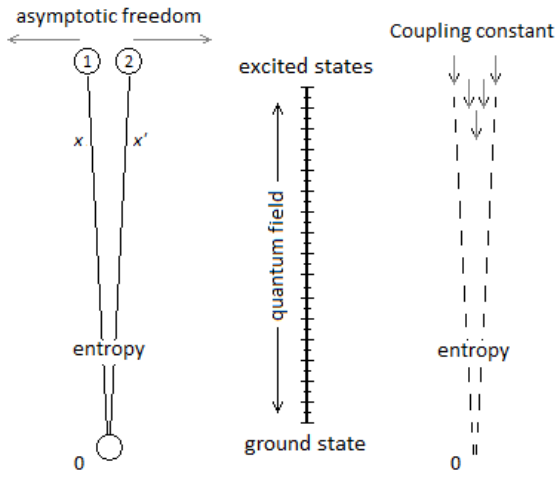

Figure 26. Quantum ChromoDynamics and coupling constant and asymptotic freedom.

15.2. Gluon & Quark

The gluon makes it possible to maintain the coherence of the quark in relation to the asymptotic freedom. But we can also understand that the gluon is more important and in terms of connection during the variation of the coupling constant towards its convergence at the level of the confinement of the quarks [82][83]. Here we understand through quantum chromodynamics, which represents correlated matter, that the general interaction field of quarks in its form of confinement, shapes objects as we perceive them (entropy [84][85]). In other words, the general field of the universe guides the quarks by forming the different atoms through the harmonic oscillator. This field is responsible for where the particle is located in the universe.

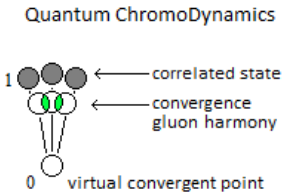

Figure 27. Quantum ChromoDynamics.

16. Particle Radiation & Boson

The implication of radiation is simply due to the fact that the particle in its oscillation is linear. The direction of the work of the particle is along the vector of gravity, namely parallel to it. With the example of the lepton/baryon the gravitational oscillator has two types of radiation. First there is the vertical radiation, called fermionic, i.e. the normal oscillation of the particle from bottom to top and from top to bottom; And there is the horizontal radiation, or bosonic radiation which is not the oscillator. For the fermionic radiation and with the example of the lepton **Figure 28** we have a movement of the particle from bottom to top in the oscillator which makes it possible to transport an electric charge to the surface of the sea of energy. In the opposite direction, either from top to bottom the particle goes down again in neutrino, or with a neutral charge. IOW this model, there is the link between Kinetic Energy and electric charge, and the neutrino follows the gravity (Potential Energy). Bosonic radiation, in its analogous interpretation, emits a kind of electric arc that occurs horizontally.

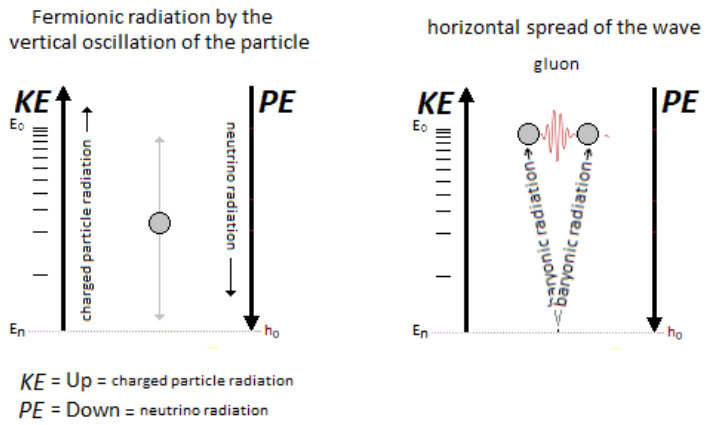

Figure 28. Fermionic radiation and Bosonic radiation.

16.1. Stimulated Emission & Boson Emission

Stimulated emission and photon emission in relation to the oscillation of the electron between its positions in orbitals in specific energy levels of the atom **Figure 29**.

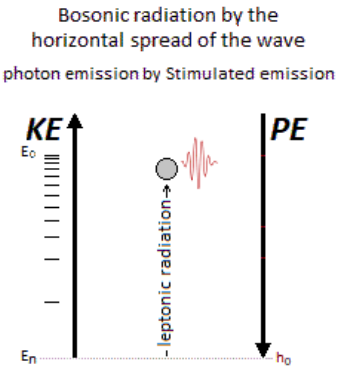

Figure 29. Stimulated emission and photon emission in relation to its orbitals.

17. Atom & Quantum Atom

The quantum atom is basically composed of quantum leap of the particle between matter and anti-matter. These jumps correspond to the Bottom-up oscillation and have an almost instantaneous value. They can for example be of the order of a few million or a few billion jumps in a nanosecond. The Pauli exclusion is always respected because there is only one particle present per atom created by a reiteration of its position in different and unique states.

The atomic model described in **Figure 30** represents the synopsis of the logical sequence of the oscillation mechanism of the particle through to the anharmonic characteristic. Its oscillation is located between matter and antimatter, where between two its acceleration would then be almost instantaneous by singularity avoidance. We can see by the anharmonic oscillator the classic version of the internuclear distance followed by the morse potential to be able to give the energy wanted to the particle.

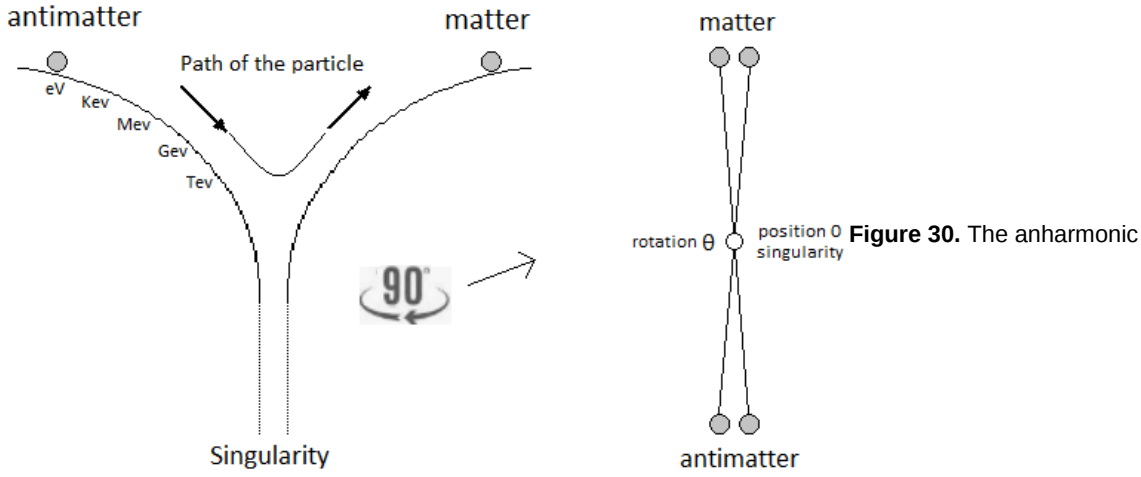

Figure 30. The anharmonic characteristic of the oscillator by the internuclear distance follow by the morse potential, makes it possible to give by the quantity of kinetic energy received from the particle its mass in term of electron-volt.

In **Figure 31** the neutrino represents the particle without electric charge and is electrically neutral. The neutrino has a direct relationship with that of Potential Energy [86]. On the contrary, when the particle is emitted by Kinetic Energy, the latter carries an electric charge.

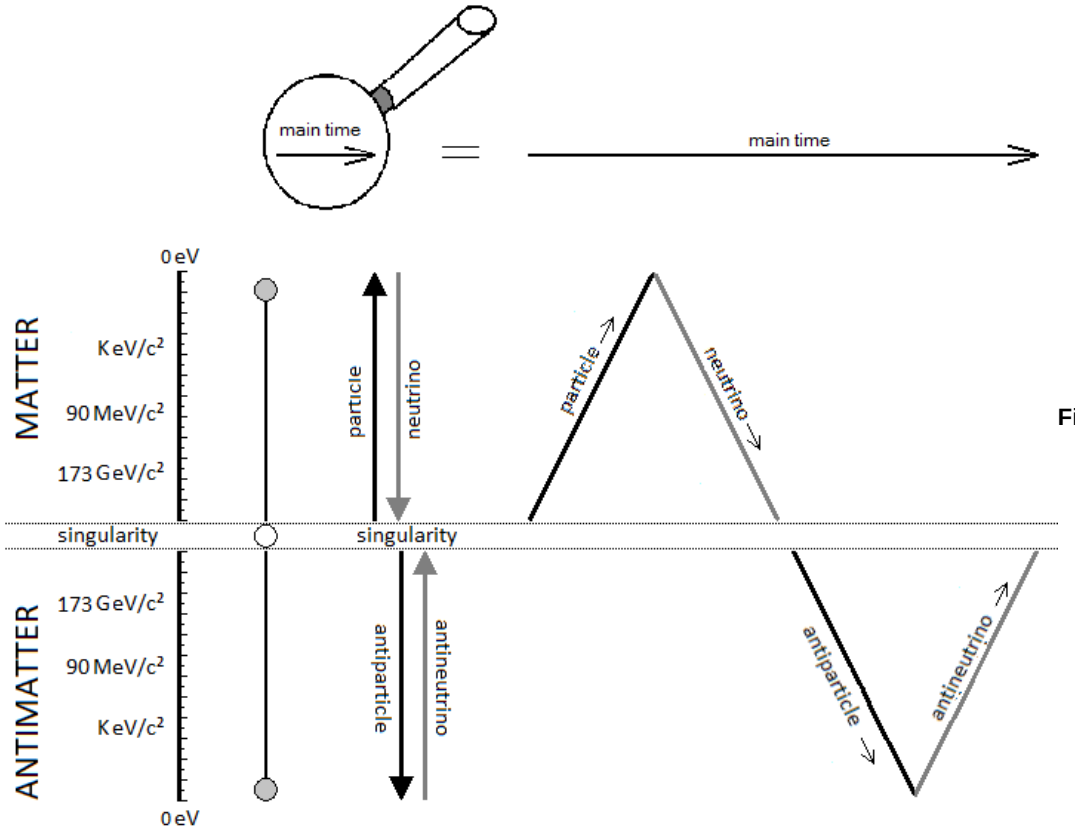

Figure 31. The linear characteristic of the displacement of the particle in its oscillation makes it possible to easily represent a radiative form of the atom followed by the spin of the particle on the surface of the sea of energy.

The dosage of the Kinetic Energy through the anharmonic oscillator with the internuclear distance makes it possible to deliver the amount of energy necessary in term of electron-volt.

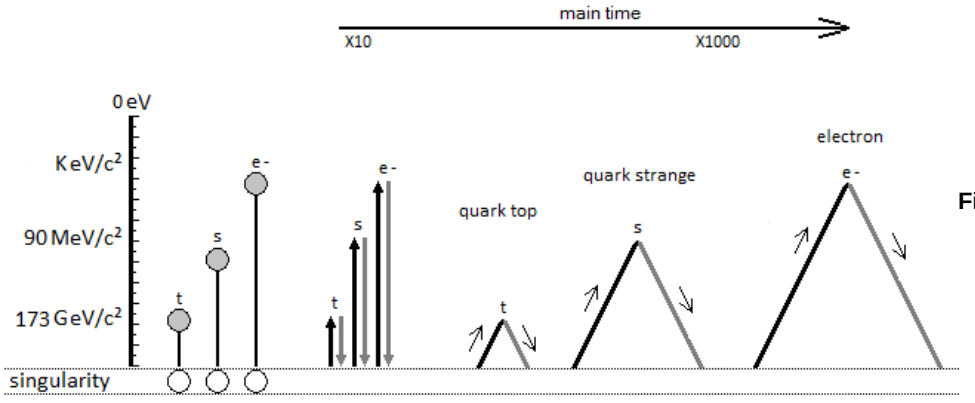

Figure 32. Atom produced by the amount of kinetic energy applied to the particle according to the morse potentials (characteristic due to the anharmonicity).

Reiteration in series of neutron N and proton P to be able to define the mathematical simulation of the pure quantum atom. The pure quantum atom is non-isotropic. It corresponds to the two choices which is that of the neutron N or the proton P. The reiteration in a series of Neutrons N followed by Protons P (same number of N as of P) is a pure atom.

Thanks to the principle of reiteration, and if you had the choice between neutron and proton, the probability of finding an N

neutron followed by a P proton like NP or NPN in the atomic nuclei is substantial. Which brings us, and in relation to the atomic signature, to the conclusion of a composition rich in Deuterium, Tritium and Helium 4-5-6 (**Figure 33, Figure 34, Figure 35)**.

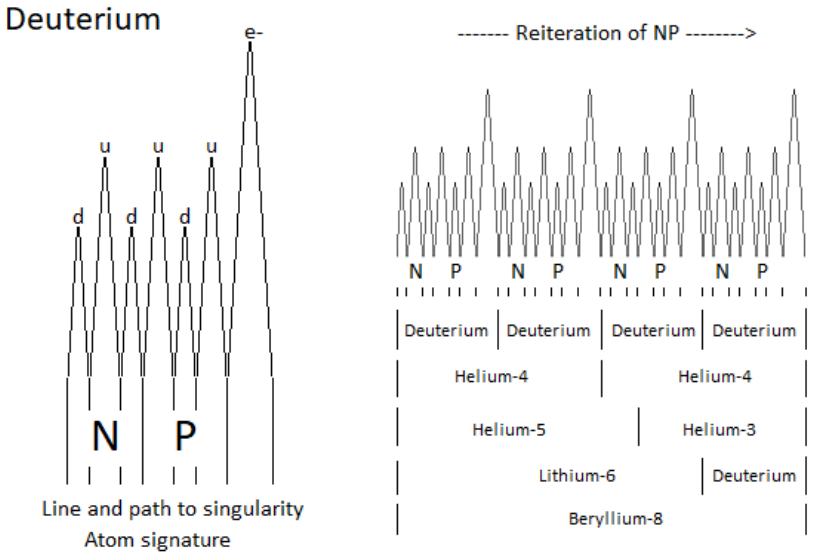

Figure 33. Deuterium Atom and reiteration of NP in series.

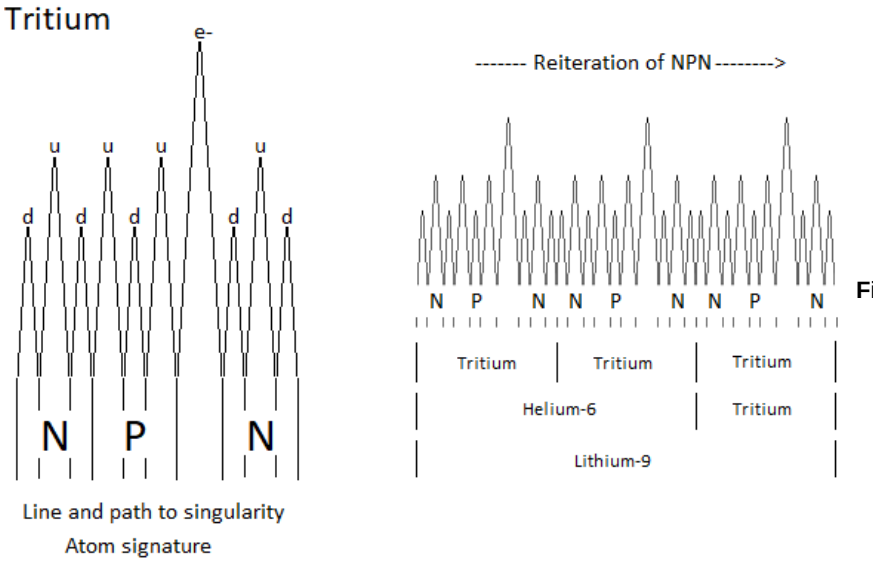

Figure 34. Tritium Atom and reiteration of NPN in series.

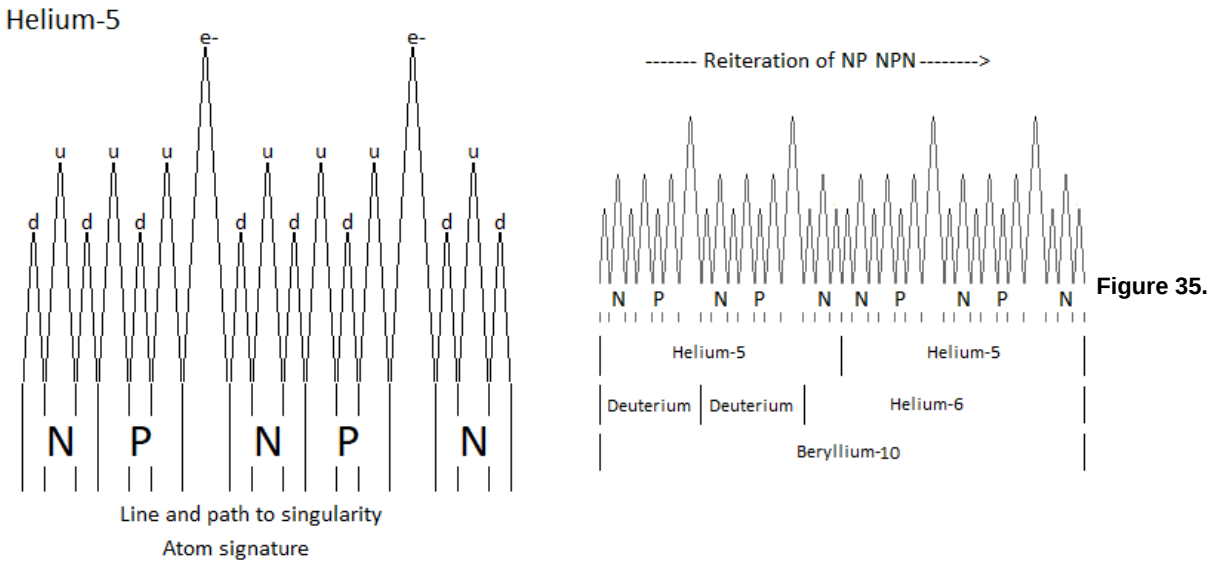

Figure 35.

Helium Atom and reiteration of NP NPN in series.

Each line in **Figure 33, Figure 34, Figure 35** with the "atom signature" represents the path of the particle to the singularity by neutrinos as it descends, and responsible for the electrical charges generated as it ascends. The line spacing corresponds to the "atomic signature" as a function of the energy delivered by the particle. The smaller the energy in electron volts, the larger the line spacing. The absence of lines indicates that there are no particles in the field to be studied.

18. Example Structures & Conclusion

18.1. Example Structures

In conclusion and by the linear radiation of the particle due to its oscillation, can build a structure by reiteration of its position and this in several places **Figure 36**. Indeed the alternation at very high frequency of the particle between its point of origin 0 and the constitutive structure, makes it possible to be able to create any object. Favoring the ironing of the particle on precise positions to the detriment of other positions makes it possible to be able to create more or less heavy objects **Figure 37**.

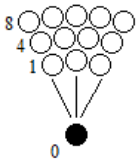

Figure 36. Reiteration by oscillation of the particle in its position in several places.

GIF

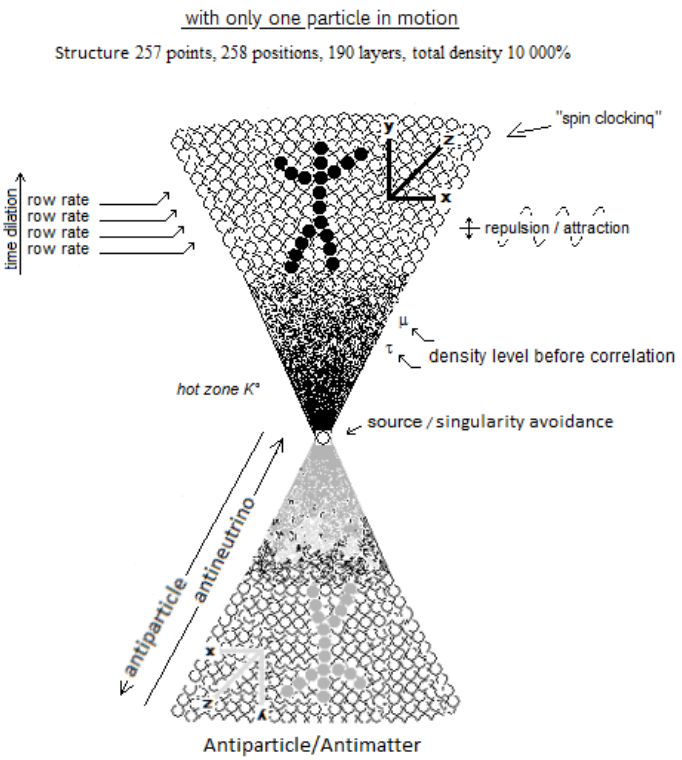

Figure 37. Example structure of the oscillation of the single particle. The field that guides the particle is responsible for the elements known.

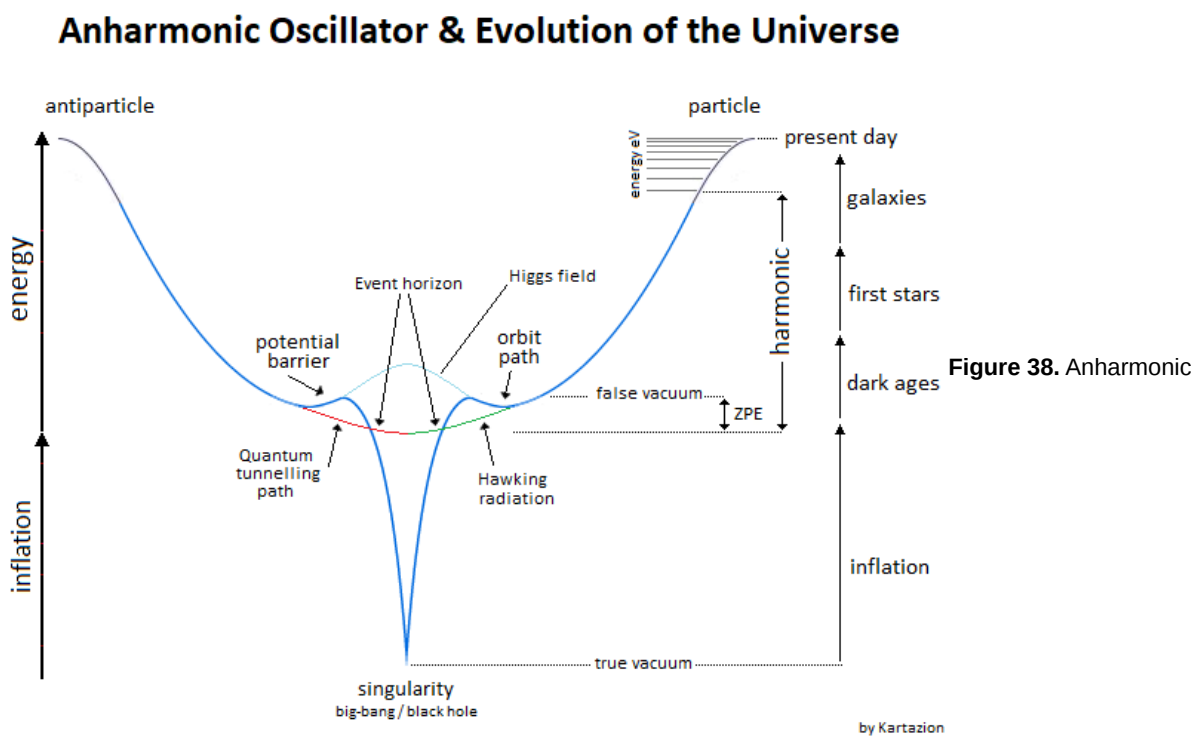

Figure 38. Anharmonic Oscillator and the evolution of the universe.

18.2. Simulation by Programming

Here is the example of a small JavaScript program [87] where its interest is to be able to put the evidence of a duplication of a particle in several places. Its operation is as follows: oscillating or alternating at the speed of light a 5mm particle from position A to position B spaced 10cm apart, would beseen as two visible points as a fixed and static appearance. The most important thing is to be able to mark a certain stop on each position of A and B, and to travel between them almost instantaneously.

18.3. Virtual Particles

Virtual particles are very well studied in Quantum Field Theory. Here [88] is the synoptis and the interpretation in image of what is a production of virtual particles. Indeed we can see there an extrapolation from the particle to the antiparticle as naturally as an an-harmonic oscillation [89].

18.4. Conclusion

The constitution of the physical laws as well as the result of this chaos of the universe until us suggests that it was premeditated.

The name of the main theory described in this paper is called Kartazion. Kartazion model of quantum physics and cosmological according to Arnaud Andrieu.

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