

An Outline on How Nature's AI Based on Space-time and Nano-Quantum Dimensionality Produced all Creations Out of Absolutely Nothing Except a Universe with Only Infinite 3D Space

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ABSTRACT

We summarized from what we currently know from all experimental data how creation of all matters out of absolutely nothing was produced by Nature, due to just the existence of Space-time nano-quantum dimensionality and listed it logically step by step in this article.

Keywords

5 Dimension Space-time, Nano-quantum Temperature, Generalized Fermat's sum.

From all the knowledge we have accumulated via experimental results in the High and Low energies regions, including those from the formation of hadrons and leptons at high energies down to the Electromagnetic Theory at low energies, we are now possible to summarize all creations only out of space-time and nano-quantum dimensionality. We shall discuss and list all the possible creations below in logical successive steps:

1. The pure Space-time obeys a quadratic Fermat's sum equation according to the Fermat's Last Theorem [1], such that a finite space with SO(3) symmetry can be generated out of absolute nothing, when time is introduced, resulting in the Fermat's sum: $(ct)^2 = r^2$, with SO(3).

That means finite empty space and time are created out of nothing when time is introduced, giving us at least a homogenous 4D topological manifold.

This Fermat's sum gives us the interdependence between t and r , through the fixed speed c for light in empty space.

2. Thereby an error in simultaneous measurements of both

space and time will necessarily have to occur, thus leading to nature's imposition of the Quantum Uncertainty, namely: $dx \cdot dt > h/2\pi$. where h is the Planck's constant, and x is any projected space vector in the 3D manifold.

3. By applying Fourier transformation to r and t , we get the corresponding Energy E and momentum p , Fermat's sum, namely: $E^2 = [cp]^2$. Preserving the SO(3) symmetry for the p space.

This expression correlates the existence of a propagating massless vector field with speed c when Energy E , is present.

This expression however does not give us the size of the space and time domain where the propagating massless field with momentum p is within the finite homogenous space time manifold.

4. In order to be able to correlates the E , p Fermat's sum to that within the finite r , t manifold that is created from nothing, we need to insert a completely imaginary component to p , when certain amount of energy is converted into a mass m obeying Special Relativity as follows: $E^2 = (cp)^2 + (Gm/r)^2$. where G is the Newtonian gravity constant and m is a finite mass obtained from conversion of part of the energy present into such a rest mass that obeys the theory of Special Relativity, located at the center of a finite SO(3) 3D space.

5. This modified E, p Fermat's sum has a solution for the momentum $p=0$, iff when $E-Gm/r=0$, thus verifying the Newtonian Law of gravity is always attractive. When we have the propagating massless electromagnetic field with energy E totally converted into a charge Q with mass m at rest in the center of the 4D space domain. This result is consistent with the Big Bang model for the creation of a charge Q with mass m out of absolute nothing, if energy is available and the Newtonian law of gravity is obeyed by the created mass. Because the gravity potential due to such a creation process it also proves that through the Covariant Riemannian Geometry for the Lorentz space-time filled with masses Einstein's General Relativity theory [2]. And the massless charge independent boson field with energy E convertible into mass must be the quantum graviton. Thus the finite homogenous 4D E,p manifold must be filled with such gravitons. Since in the 4 Dimension Electromagnetic theory we need the presence of a vector charge current to be able to generate the EM fields, which implies that the 4D Space-time only is not sufficient if EM fields are able to be generated out from such a finite 4D homogenous manifold unless we expense the homogenous space-time dimension to 5D, by introducing the 4th Space dimension as an entangled coordinate given by r, the radius vector in the spherical symmetry as proposed by Maxwell [3] and is totally filled with magnetic monopoles, convertible to mass and are thus also gravitons.
 6. Since the photon field cannot exist without the existence of a vector charge current, creation out of nothing requires also the creation of charges that carry the energy. From our knowledge of EM theory, where we have charge currents generated by the flow of electrons, each having rest masses of 0.5MeV. and having a charge value of -e. Since the charge unit -e, is also mathematically the Cartan generator for the SU(2) Semi-simple Compact Lie Group. But only the presence of -e charges from SU(2) group within the 4D space-time manifold violates the creation principle out of nothing unless the current vector is obtained from a set of unobservable magnetic monopole with net 0 monopole pair charge strength, as first suggested by T.J. Maxwell, by extending the homogenous 4D into a homogenous 5D manifold such that a cancelling +e charge can be added through the addition of a set of SU(3) Cartan generators, namely: $[2/3]e$; $[2/3]e$, and $[-1/3]e$, which add up to exactly +e, and as they satisfy the normalization and the commutative rules required by the SU(3) group, namely: $[2/3]^2 + [2/3]^2 + [-1/3]^2 = 1$ and $[2/3]x[-2/3] + [2/3]x[1/3] + [-1/3]x[-2/3] = 0$ [4].
 7. Through the maintenance of the SO(3) symmetry, this, 4th space dimension then must be the radius r, which make the radius r, an entangled variable of the finite 5D manifold, so that from which a set of the unobservable magnetic graviton monopoles can be formed by the forming of ODLRO of Lie Groups generators with charges Q(j) in terms of massless 2Q(j) pairs having velocity c which carries energy. Since when we sum over all these magnetic monopole terms [5] obtained from both SU(2) and SU(3) generators they exactly cancelled, thereby maintaining the creation out of nothing principle including a net 0 charge.
 8. This total net 0 monopole charge requirement for the homogenous 5D manifold can be easily verified by addition to the SU(2) group that gives us the electron charge -e to those Qj charges from the SU(3) group, which are the Cartan generators: $(2/3)e$; $(2/3)e$ and $-(1/3)e$. giving us 3 pairs of Qj, for the monopoles that exactly sums up to +2ce. Since all quantum charges are spinors that satisfy Dirac equation, then the monopoles being composed of product of two spinors are Bosons, but being unobservable in the 5D space-time must therefore be in a condensed Bose-Einstein Ground State, as suggested by Higgs [5]. In fact, these magnetic monopoles because of their ODLRO, Off-Diagonal-Long-Range-Order, of the pair spinor charges, must also be in a superconducting state, hence implying that the Higgs vacuum is in fact in the superconducting ground state which must have a critical temperature Tc, that depends on the value of r and t of the 4D manifold. This means the homogenous 5D manifold created out of nothing must contain energies carried by these magnetic monopole graviton superconducting Boson fields which are in the ground state vacuum. Hence in order to create free massive charges from the superconducting monopoles due to SU(2) as well as those due to SU(3) it must be caused by a thermal excitation to temperature above Tc that will then breaks the ODLRO condensation, quite similar in form to the mechanism governing the Superconductivity in a HTC ceramic, where the valence band hole states are in the ODLRO, different from the BCS metallic superconductors formed by an electron pair [6]. Although in HTC, the ODLRO valence band hole pair states are induced by the coupling to the excitonic states within the band gap of the HTC ceramic [12] and also that these valence band hole pairs are not magnetic monopole [7].
 9. With this homogenous finite 5D manifold created, matters and charges with mass are created via thermal excitations to temperatures above the Tc of the 5D Higgs vacuum [5]. In order to have thermal excitation mechanism so that the Higgs vacuum filled with monopoles from SU(2) and SU(3) can be converted into massive charges at the same instant and temperature we need to modify the finite r in the 5D Space-time Fermat's sum to include Temperature T, as an imaginary quantum parameter to time in the Fermat's space-time sum out of nothing. Following the same mathematical method as in our Energy, momentum Fermat's sum modification where we inserted the Gravitation potential term due to Special Relativity that mass motion must obey as an imaginary component to the momentum, thus giving us the modified space-time Fermat's sum as follows: $(ct)^2 + [(h/2\pi)/kT]^2 = r^2$. where k is the Boltzmann constant.
- This new form has some very interesting physical features. As we let T goes to infinity, the Fermat's sum reverted to the original homogenous 5D form, which implies indeed creation obeys a

Big Bang model, where Temperature inside the finite r , domain becomes infinitely high. And the T_c value for the superconducting monopoles is in fact the same as the Bethe fusion temperature $T(B)$, since they both represents the Critical Temperature for the breaking of the ODLRO of all the charge pairs in the Higgs vacuum. All these phenomena we mentioned above that must happen in creation must be observed in the astronomical scale from the 5D high Temperature core of a galaxy such as the Milky Way, where the sun and earth are and supported by data we must be able to obtain. In the fixed r enclosed core domain of a star, as well as in the open center of a galaxy [8]. Since the galactic core with time independent r is filled with monopoles that are also attractive gravitons, it must then act to pull all external masses towards it, thus causes all the stars in the 2D galaxy plane to revolve in planer orbits around the galactic core, a feature similar to the quantum 2D hydrogen, where the Coulomb attractive potential replaces the gravitational potential [9] if the stars are to remain outside the galactic core.

10. While in the other limit, as T becomes 0, the created space r domain given by the Fermat's sum becomes infinite, irrespective of time. A result with some religious connotation that God the creator by introducing time and Temperature into the 5D Space-time manifold is topologically represented by the Universe with an infinite 4D Space.

And matter creation is through the initiation of time together with an infinite Temperature by the creator as depicted by the Big Bang model for all matter creation out of nothing. To astronomically verify the validity of this T depending space-time Fermat's sum, let us investigate the 5D core of our Milky Way galaxy, where r appears to be fixed and independent of time. Thus by differentiating r with time t , and set it to 0, we obtain $c^2 \cdot t = [(h/2\pi)/k]^2 / T^3$.

Which is the Black Body photon radiation formula, and therefore should be observed emitted from the Milky Way core. In fact, this radiation was observed and recorded by NASA, in a photo shown on the cover of our previously published 5D field theory book [9].

11. Now let us turn to the finding of the set of eigenvalues from all the magnetic monopoles which added up to near infinity within the Higgs vacuum. If indeed we have creation given by a Big Bang at extremely high Temperatures out of nothing. Since the electron rest mass $m(e)$ is well known and given by exactly 0.5 MeV., while the Quark masses are in exact same fractional dependence as given by their charges Q_j , according to the projection theory [8] from, the homogenous 5D manifold to the in-homogenous 4D Lorentz manifold. And from experimental data obtained by fitting mass data of all the hadrons, we had found that the Quarks unit mass M , is exactly equal to 33MeV [8]. Or in another word M is equal to 66 $m(e)$. This result gives us the neutron, without the gluon binding a combination of the $2/3e$, and two $-1/3e$ Quarks has a Quark mass equal to 88 $m(e)$. Although because of the two separate $(2/3)e$ generators the Quark mass for the neutron is actually a doublet. This means that the energy associated with

creating one of the two neutron states from Quarks which is also the lightest nucleon will be equal to the creating as much as simultaneously 88 electrons. Should we replace these 88 discrete energy levels figuratively in term of sound wave frequencies, though way higher than the audible range, figuratively they still exactly give us the piano keyboard. In this sense the mixing of all matter creations through thermal fluctuations above T_c resembles a Symphony music piece. But beyond this piano key board range, we still have another 22 $m(e)$ levels before we get to the bare proton Quark mass. Only at that energy value, we can regain charge neutralization from the simultaneous creation of a proton to neutralize the electron such that we can have the formation of charge neutral atoms. Since the highest Quark mass energy state is the doubly degenerate neutron with energy $2 \times 88 m(e)^2$, which is higher than that of creating a hydrogen atom. In another word thermal excitation of the monopoles within the 5D homogenous manifold is also responsible for the creation of atoms. If $T(c)$ represents the critical temperature necessary to create an electron by thermal excitation, then $kT(c)$ where k is the Boltzmann constant $= 1.38 \times 10^{-10} \text{ MeV/K}$. is the thermal energy for creating one electron, and $kT\{N\}$ the energy for thermally creating a neutron would have to be equal to $88kT(c)$, while the Temperature $T(P)$ needed for creating a proton would be equal to $110T(c)$, but because of the two $(2/3)e$ Cartan generators in $SU(3)$, the neutron state is a doublet, hence has a bigger weight in the fusion process on creation. Since $kT(c) = 0.5 \text{ MeV}$. Giving us $T(c) = 0.3623 \times 10^{10} \text{ K}$. Experimentally we found that fusion creation Temperature for both the neutron and proton expressed as $T(B)$ temperature is of order 10^{14} K , which is roughly 10^4 higher than that of $T(c)$. This higher critical temperature result is of course due to the necessity for maintaining the charge conservation as matter is created by thermal excitations above T_c of the Higgs vacuum, so that there exist one and only one Thermal phase transition temperature T_c ; that is the Fusion temperature $T(B)$.

12. The creation of a neutron in terms of Quarks, requires exactly $88kT(e)$, which is a doublet. Therefore, in the ODLRO breaking process, to get a neutron, we require a thermal energy of $2 \times 88kT(e)$, and for the creation of a proton, we need $110kT(e)$. As monopoles are formed by pairs of same charges, hence the energy involved in the breaking must all be double those of each particle, giving us a total amount from all the monopoles $\{2 \times 0.5 + 2 \times 2 \times 44 + 2 \times 55\} \text{ MeV} = 287 \text{ MeV}$. This results in a $T(B)$ fusion temperature of $2.07974 \times 10^{12} \text{ K}$. Because the monopoles are along r in the homogenous 5D manifold, we need to also multiple $T(B)$ with the phase space factor of 4π , which then gives us $0.26134 \times 10^{14} \text{ K}$. Finally, because of the homogeneity of the 5D space-time manifold, we need to further multiply $T(B)$ with the factor 5, giving us the Bethe fusion temperature $T(F) = 1.3067 \times 10^{14} \text{ K}$, a value that agrees very well with the observed experimental value. The numerical $T(F)$ result due to the multiplication factor 5 confirms the 5D dimension of the Space-time manifold, shows perfect agreement with the Maxwell's EM theory. Since the pure

neutron is composed of 2 $-(1/3)e$ and 1 $(2/3)e$ Quarks having an energy of $88kT(e)$ is the lowest stable matter from the SU(3) Quarks, in the astronomical scale it must be the lowest mass state of a star which also agrees well with our astronomical observation as a dead star with near 0 temperature will eventually become a neutron star. Therefore, we should expect as temperature decreases from the fusion temperature $T(F)$, more complex structures, due to Coulomb and gravitational forces together with dimension reduction mappings will be formed, leading us to the multitude of elements and the near infinite types of chemical compounds. Using the hard sphere model representing each nucleon the element helium nucleus is a Boson in the form of a simple 2 D ring, with a 0 size 4D empty center, therefore the element He cannot contain a monopole core and is very stable resembling a quantum size galactic ring structure which can remain in its BE condense state despite its two protons are not in an ODLRO state. This picture of He also satisfies the projection theory given by the Perelman Ricci-flow entropy mapping [4]. To form a totally enclosed nucleon quantum size spherical 4D void according to the hard sphere model [4] generated by Perelman mapping, we have to go to the nucleus of Carbon 12, with 6 protons and 6 neutrons, there and there only we have a 4D space void of a nucleon size, so that an ODLRO monopole state with certain discrete wave-lengths can exist by the quantum tunneling mechanism whenever a closed ring consisting of carbon 12 is present [12]. It is this feature that makes Carbon 12, very special and as a co-valence atom, it can readily form into hydrocarbon structures with such closed loops. In biological cells such closed loops structures can be formed by joining the 2 dimension Nitrogenous bases into the form of DNAs [8]. There the integer dimension integer 5 is replaced by a lower number from 5 down to 0, then $T(B)$ becomes representing the Temperature much much lower than $T(c)$; that for nature's creations of different stages due to dimension projection, all the way down to its lowest $n=0$ which is just a point. Therefore, for the existence of nitrogenous bases, and thereby biological DNAs [8], n will have to be equal to $2x1$ the lowest possible step in the 3D space to remain stable at Temperature far below the $T(c)$ value. In fact, due to the quantum solution of any matter in 2D, it is given by the Schrodinger's equation, while for the 1D, we have the Dirac equation for the electron, which also makes the electron a spinor satisfying Lorentz gauge. As expected the relativistic 2D hydrogen solution exactly solved [11], gives us the collapse of the electron orbit into the center proton, thus reducing hydrogen into a charge 0, mass only particle with a gravity potential, thus reducing the hydrogen back into the Energy-momentum Fermat's sum given in section 4 as expected.

13. Because an isolated homogenous astronomical size 5D domain due to the presence of monopoles which are gravitons, thus it will act like an energy sink and will naturally pull in any energy fields outside its domain, so as to maintain its size by maintaining a fixed Temperature within to counteract the natural thermal cooling mechanism. Since the Perelman

mapping can be extended to the formation of a totally enclosed sphere with a 5D core of very large astronomical sizes thus forming a star or a planet, with all the magnetic properties discussed above. Such stable processes obviously will have to be in a Temperature range below $T(B)$. Through such topological mappings, that occurs at different Temperature steps, and the principle of energy minimization numerous different complicated molecular structures can then be created, thus from compounds which form from minerals given in forms of natural rocks, to complex biological cells in the $n=2$ thermal step depending on the other physical boundary factors, such as the size of the containing volume and the pressure within it. Although these processes of creation are very complicated, particularly when those modular structures etc, that allows the ODLRO monopole states with very long wave-lengths to exist via Josephson quantum tunneling of a closed loop, containing carbons, since carbon 12, is a unique atom, where its nuclear core contains the symmetric nucleon size time frozen empty 5D core.

Thus from complex bio-cells, down to the DNAs, which are given by the Stacking of nitrogenous bases, they all have closed loops of C12 atoms. Such that a unique set of discrete ODLRO Boson spectra set of monopole states are allowed which will then form a Boolean algebra.

Thereby giving the biological cells individual Artificial Intelligence. And hence also giving all living organs its senses. For our readers who are interested in exploring the biological structures, we suggest the book "Innovation is the Best Medicine" by doctor Roderick Wong [13].

14. Despite the complexity of each step in the natural AI of creations, through our senses we can learn and find out all these physical details via our intelligence and learning, thus making us, human, acting as an observer to all of God's creations. Hence giving creations a philosophical existence purpose. And as we understand all these physical details we will eventually be able to modify the creation processes, including eliminating all cancers. Except we can never revert time because the 5D space-time manifold obeys Fermat's sum.
15. As the DNA is passed from parents to children, the AI can also be passed from generation to the next, making knowledge and behaviors also pass from generation to the next, under a advantage in generation continuation moral code. Such as religions based in ancestors worship as preached throughout the Chinese history or the totally inclusive love as preached through Christianity. Eventually human's ability to modify creation of practically everything will increase with no limits. In this sense we human if we survive from possible self-destruction will eventually become in ability to God the creator of everything out of nothing by introducing time and Temperature, thus giving raise to new finite 5D manifolds with their own respective superconducting vacuum, filled with quantum gravity magnetic monopoles.

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