

A Creation Model from the Gell-Mann Standard Model to the Creation of Bio Cells: Based on the Assumption of Homogeneous 5D Space-Time Universe

Kai Wai Wong¹, Wan Ki Chow²

¹Department of Physics and Astronomy, University of Kansas, Lawrence, USA

²Department of Building Services Engineering, The Hong Kong Polytechnic University, Hong Kong, China

Email: kww88ng@gmail.com

How to cite this paper: Wong, K.W. and Chow, W.K. (2020) A Creation Model from the Gell-Mann Standard Model to the Creation of Bio Cells: Based on the Assumption of Homogeneous 5D Space-Time Universe. *Journal of Modern Physics*, 11, 1058-1074. <https://doi.org/10.4236/jmp.2020.117067>

Received: June 15, 2020

Accepted: July 17, 2020

Published: July 20, 2020

Copyright © 2020 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

In this paper, we briefly go over the homogeneous 5D model field theory: from the 5D space-time inception, to its quantum field solutions given in terms of Higgs vacuum, filled with magnetic monopole bose fields of all energies. Then through the space dimension reduction projections, the Gell-Mann standard model was obtained as well as a quantum to Classical connection was made via introducing Bose distribution to the monopoles to obtain the Perelman entropy and Ricci Flow mappings. This provided us a picture to the creation of Astronomical objects, from galaxies to stars and planets. This method of splitting the monopole energy into ranges is extended to show that below the basic rest mass range of the electron and Quark, it still can be applied to explaining for the creation of the chemical elements periodic table. But perhaps the most interesting is in the lowest hundreds of Hz energy range, obtained from yet another 3 fold space symmetry breaking, into $2D \times 1D$, producing bio nitrogenous bases composed of 3 Carbon 12 in hexagon structures, due to preservation of the 1D monopole standing waves of this low frequencies. From that by imposing gauge changes the monopole states into DNA spectra. Since such spectra states retain the DLRO, it induces formation of charge carriers periodicity in a spherical bio cell.. It was then argued that due to cell's surface proteins, the structure must contain partial filled VB, with " p " state hole density, and empty CB, separated from VB by a positive band gap. Such band structures resemble known HTC Cuprate ceramics. Since the HTC goes through a Superconductivity transition via the simultaneous bose exciton condensation, providing a Coulomb pressure, which reduces the band gap substantially, and induces the ODLRO transition of the hole density. The same obviously applies to the bio cells. Because of the

near continuous exciton levels generated, a matching to the DNA spectra then can always occur by selective choices of proteins on the cell surface. Judging from a numerical study, we did years ago on YBCO, with doping. We found with a large enough VB hole density, the exciton induced superconducting gap can easily lead to T_c in the room temperature range. In fact by EMF excitation can increase the exciton pressure and trigger the ODLRO transition T_c upward. In fact, numerical results then suggest there do exist coherent EMF spectra from three key elements: Water, Carbon and Hydrogen, together with Oxygen, as studied over the years by numerous people, starting from Schrödinger to most recently Geesink.

Keywords

5D Fermat's Theorem, Space Dimension Reduction Projections, Perelman Mappings, The Higgs Vacuum: A B.E. Condensed Monopole Bosons, Realization of Excitonic Induced Superconducting " p " Valence Band Orbitals in Bio Cells, The Final Coherent Building Block EMF Spectra: Water, Carbon, Hydrogen and Oxygen

1. Introduction

Our advances in knowledge on mathematics, natural sciences, and biological sciences have accelerated since Newton's theory of gravity, based on principles that do not appear to be linked. In this paper, we hope to show that all these principles for all the areas of our knowledge are in fact linked through mathematical theorems associated with a homogeneous 5D common space-time topology. The complete mathematical understanding of the Electromagnetic Theory was forwarded by Maxwell, by recognizing that the 4 electromagnetic vector potentials are the solutions to that of the 4D homogeneous space-time, which obeys the Fermat's Last Theorem [1]: a seemingly very simple space-time topology. Yet the solutions between electric and magnetic fields are unsymmetrical [2]. This broken symmetry between electric and magnetic fields, led Maxwell to suggest a missing fifth component magnetic monopole potential, which can restore symmetry. Yet since, such a magnetic monopole was not observed within the framework of electrodynamics, the suggested magnetic monopole potential can then only form a direct product to those of the other 4 electromagnetic vector potentials. Hence, this monopole potential can only be the result of extending the space-time homogeneous manifold to 5D. Furthermore, since the 4D space satisfies Fermat's sum. It would necessarily make the radius " r " vector an entangled variable to the 4th space dimension. In fact, " r " as an entangled variable is in topological agreement to that of 4 space dimensions, as expressed in the Pythagorus sum, gives " r " with three angle variables: namely $0 < \theta < \pi$; $0 < \varphi < 2\pi$ and $0 < \psi < 4\pi$. ψ limit happens to be identical to that of the solid angle for 3D space. It is based on this topological observation, and from the concept of having massless, e and $-e$ spinor, we have derived the

explicit form of the Maxwell's magnetic monopole [3]. Together with the application of the uncertainty principle, and the space dimension reduction by projections into a 4D Lorentz space-time, we have then extended the homogeneous 5D as the space-time of the universe, with the reciprocal 5D energy, momenta representation. From which we presented a grand unified field theory that encompasses the Gell-Mann quark model [4], as obtained from the space to space conformal projection P1, and the Leptonic weak theory, an equivalent to separating e and $-e$ of the charge neutral magnetic monopole through the space to time projection Po into only gauge conserved $-e$ massive spinor [5]; while the space to space conformal projection that gives the fractionally charged Quark model that, for the $+e$ component, must then retain and satisfy gauge invariance. Hence, the Higgs' vacuum [6] as identified in terms of the DLRO (Diagonal Long Range Order) Bose-Einstein condensed monopoles massless, charge 0, Bose fields with arbitrary quantum energies $2h\nu$ was developed [3].

It is the purpose of this paper to both summarize and fill in gaps left not addressed in reference [5]. Thus readers that did not read [5] can find the rest of the paper incomprehensible.

As the 5D homogeneous manifold is chargeless, massless, and does not possess time reversal symmetry, all space dimension projections must retain charge neutrality at all time in the reduced 4D Lorentz domain. Therefore, when an electron is created, a proton must also be created. This charge neutrality constrain in the presence of a Coulomb potential, and via the Schrödinger's equation, leads us to the Bohr model, for atoms, and gives us the periodic table for elements, provided the protons are in the respective nucleus. Since the proton is obtained from the combination of the up, up and down quarks confined by gauge, the protons within a nucleus must also be gauge confined together. That means the gauge loop within the nucleus must be given by a N order knot, looping over all N nucleons within the nucleus. In 3D space, a closed loop uniquely defines a plane in which it encloses, thus a knot can be transformed into a single loop.

Under 4D space, such a knot cannot be transformed into a single 2D loop, as there remains two variables, such that a single 2D plane is not uniquely definable. It is this mathematical topology that allows the gauge invariance to holds the repulsive protons within the nucleus together, similar to the gluons which are tensor products of the EM vector potentials under gauge confinement give raise to most of the nucleon rest mass. Based on the above, the homogeneous 5D quantum field Theory was forwarded by us to explain the origin for the universe, including proving the quantum to classical Perelman-Ricci-Flow and Perelman-entropy mappings [7] [8] connections. Through this connection provides us with a picture on how galaxies, stars and planets were created during the Big Bang [9] [10]. We will further discuss in section 2 more details on the mathematical relations between the quantum and classical mappings from 5D to Lorentz 4D.

There remains then, the very low monopole energy region, that is

$0 < 2hv < 2m(e)c^2$ region. It was shown previously that the monopole boson field can exist within a carbon 12 nuclear core, provided it can complete a closed gauge loop via quantum tunneling from carbon core to carbon core. To achieve this gauge loop we had proposed that the process of quantum tunneling is from a nitrogenous base to the next layer nitrogenous base with random ordering and reflected back at the end caps base [11], hence producing the DNA spectra of the life form. This very last low frequencies monopole being of DLRO spectra of the DNA is than applied as a global ordering induction, so that the ODLRO (Off-Diagonal-Long-Range-Order) phase transition of the charge carriers within the bio cells occurs, thereby leading to a natural cell growth [12]. It is this low frequency quantum feature of the monopole states that produces the EMF coherent and de-coherent quantum ensemble properties that were first suggested by Schrödinger as the bases of life and extended quantitatively by Frohlich [13]. In the forth section of this paper, we follow the EMF expression given in the recent works of Hans J. Geesink and his collaborators, and examine how their expression on the EMF spectra of biological systems [14] [15] can be made compatible to that from the 5D field theory.

2. Big Bang

Most astronomers believe in the Big Bang for the beginning of the Universe. It is fascinating to investigate the meaning of this Beginning of Creation.

We had postulated that the Universe is in a homogeneous 5D space-time manifold [6], which satisfies the Fermat's Last Theorem [1]:

$$(ct)^2 = \sum_{j=1}^4 x_j^2 = r^2 \quad (1)$$

r is the Fermat's amplitude, and r^2 is a positive scaler, spanning "an increasing" space volume.

In fact, this homogeneous 5D manifold has several important physical meanings. Namely: As space is only positive, time can only increase. As the negative " t " root from the quadratic Equation (1) violates causality, when r^2 spans "the increasing" volume. Hence t only increases. This remark is also valid for the homogeneous 4D Maxwell manifold, giving us that light only propagates outward in time from its source. Thus any fields within the manifold do not have time reversal symmetry. Secondly, the homogeneous manifold contains no net amount of charges of either sign, which means all creations from this homogeneous space-time must maintain net charge neutrality. Thirdly, in order that matter can be created from it by space dimension reduction into a 4D Lorentz manifold, where Einstein's $E = mc^2$ is satisfied, there must exist a corresponding Fermat's representation in terms of Energy and 4 momenta:

$$E^2 = \sum_{j=1}^4 c^2 p_j^2 \quad (2)$$

Because of Equation (1) and Equation (2), there must exist a unique relationship between time variation to Energy variation, which of course would also de-

fine the same variation relationship between space and momentum. This relationship is the uncertainty principle:

$$\delta E \delta t \geq h \quad (3)$$

Since the Universe started from $t = 0$, implies it must start from infinite amount of energy. Therefore, it started with a Big Bang.

Now applying the uncertainty principle, the Fermat's sum of Energy and momenta, becomes a second order homogeneous quadratic differential operator, which means solutions within it must be massless, and 0 net charge waves, but they cannot be electromagnetic waves. As electromagnetic waves are in the homogeneous 4D Maxwell space-time, their existence require the present of an electrical current source.

Hence, the massless wave within the 5D that carries energy only, must be a Boson field with net 0 charge, and according to Maxwell [2] generates the magnetic monopole potential, namely:

$$+ \text{ or } - \frac{2ec\mu}{r} \quad (4)$$

where μ is the magnetic susceptibility.

Where $+e$ and $-e$ are the charge signature of massless spinor, that are solutions to the Dirac linearized differential equation obtained from Equation (2). These massless charged spinors were coined by us [5] as e-trino, and anti-e-trino. Therefore, Equation (4) represents the radiating current at speed c along the Fermat's radius " r ", by a net charge 0, and 0 momentum Boson field obtained from the product of a pair of opposite momentum e-trino and anti-e-trino, which carries a quantum energy of $2h\nu$. The restriction that this opposite charged massless spinor pair must also have opposite momenta, is because they must be in a Diagonal Long Range Order, and filled the expanding homogeneous 5D manifold, so that in energy, momentum representation it preserves homogeneity also. It is this very important feature, that we can consider that the homogeneous 5D Universe, must be given by a Bose-Einstein condensed vacuum with energies carried by e-trino, anti-e-trino pairs. In terms of Higgs' theory [6], these bosons are the Higgs' fields.

It is also interesting to observe that $2ec$ looks like a charge current, and if so should generate electromagnetic waves as represented by photons, yet photons radiation are given as Poynting vectors, which has orthogonal E, H oscillating fields. While as monopole solution, E, H cannot be present. Therefore, in terms of photons, this Boson if it radiates photons, must radiates a 180 degree off-phase photon pair, having energy $2h\nu$ and momentum $2h\nu/c$.

However, this Higgs' Boson is in the BE condensed state, it cannot have a net momentum. Hence, the $2ec$ is not a charge current, and c is just a parameter not the velocity of photon, hence $2ec$ represents a magnetic monopole value and does not radiates [3].

$$J(r) = ec - ec = 0 \quad (5)$$

This magnetic monopole potential given by Equation (5) is not of the same dimension as the Coulomb potential. While the magnetic monopole potential energy is in the same dimension as the Coulomb potential energy.

In electrodynamics, given in the homogeneous 4D Maxwell manifold, energy is carried by photons emitted from a charged current, which as we mentioned is absent in the homogeneous 5D manifold, hence although the monopole Bosons carry energy, we some time describe this 5D space-time of the Universe as Dark Matter domain, a vacuum filled with the Bose-Einstein condensed Higgs' bosons. Accordingly, we can define a Bose distribution

$$\frac{1}{e^{\frac{h\nu''}{kT}} - 1} \quad (6)$$

where $\nu'' = \nu' - 2\nu > 0$, and is the frequency of the excited monopole with eigen-energy $h\nu'$.

Therefore the vacuum is excited when $h\nu'' > 0$, and the BE condensation is broken. We can likewise view the vacuum as providing a quantum potential well:

$$W = -4\pi(2ec)^2 \mu \frac{(kTN)^2}{cr} \quad (7)$$

where

$$N = 2 \sum_{j=1}^{\infty} \frac{e^{-jC}}{j} \quad (8)$$

and $C = 2m(e)c^2/kT$.

N comes from integrating $h\nu''/kT$ from C to infinity. Note N is finite as long as $C > 0$. This quantum well then represents the energy converted into massive $-e$ charged lepton and $+e$ massive proton. ν'' being a frequency above 2ν of a specific Higgs' field is critical to holding the creation of a massive electron to that required to simultaneously create a proton and possibly also neutrons by the separation of e and $-e$ in the monopole, such that charge neutrality can be maintained at all time t , despite the proton and neutron creation needs the creation of the SU(3) generators: $2/3e$, $2/3e$ and $-1/3e$. Hence to be simultaneous must be obtained from at least different Higgs' field [see chapter 8, of reference 5 for detail]. It should be emphasized that the creating of a complete set of quarks requires energy equivalent to $m(q)c^2$, where $m(q)$ is the bare quark mass.

Since the quarks are obtained by the conformal projection P1, from the 4th space dimension onto any other remaining 3 space dimensions. With 3 quark generators, there are therefore $4 \times 4 \times 4$ different Higgs choices of the P1 projections. Or that we require at least 64 different energy Higgs' bosons. Each contributes at least $m(e)c^2$ due to the 3 P1 choices to create simultaneously the proton. Hence the ratio of $m(q)/m(e) = 4 \times 4 \times 4$. In another word $m(q)c^2 = 64 \times m(e)c^2$, which is 32 MeV. In agreement to the value we obtained from the experimentally measured and model calculated hadron masses [5] [16] [17]. It is this rela-

tionship that makes the minimum C value depends on twice the electron rest mass energy to be able to maintain charge neutrality at all time.

Therefore within the 4D Lorentz domain, the total ensemble averaged energy of the projections created masses satisfies

$$\langle E \rangle_T + W = 0 \quad (9)$$

This new law allows the 5D Universe to start with infinite energy as is given by the Big Bang, and simultaneous provide with a negative infinite W , when no mass is present C was 0, when $t = 0$, giving us that the Universe creation is from a very philosophical absolute NOTHING, with no space and no time.

Based on Equation (8) we have published an article [11] connecting this thermal quantum mass creation to those of Perelman's Ricci-Flow and Perelman's entropy mappings [7] [8] and applied it to the study of stars and planets with good successes [9] [10].

Giving us a further topological understanding on the processes and time sequence of different sizes galaxies, stars and planets creation in their respective 4D Lorentz space-time domains out from the 5D homogeneous space-time manifold.

As masses moves within the Lorentz space-time, their energies and momenta must be expressed in covariant form, hence leading us to formulate the Lorentz domain in terms of covariant Riemannian curvatures, thus establishes Einstein's General Relativity [18]. It is from the curvature metrics that we derive the non-linear gravity equation and deduced the force of gravity between masses. As this gravity equation is non-linear, its solutions contain singularities in the Lorentz manifold. It is such singularities that become sinks for sucking in matters, unless either artificially excluded from containing masses, or else a counter repulsive force is automatically generated when masses spiral into these singularities [19]. Without which, masses will have to revert back into pure energy. In the 5D theory [5], all masses originated by irreversible space dimension reduction projections. As the homogenous 5D manifold has no time reversal symmetry, that means mass cannot revert back to pure energy. Thus the suggested automatic removal of the gravitation singularities must exist. In fact, from the Perelman's entropy mapping, we observed that for massive systems having more than 12 nucleons, there must exist a time frozen 4D space void core. This topology gives us the lowest spherical nucleus, the carbon 12 nucleus. Such a C12 nucleus, would have contained monopoles with standing waves energies higher than $2m(e)c^2$, thus not possible as we discussed in ref. [11]. But then nucleus do not collapse due to proton-proton repulsion. While astronomical objects, like stars, and planets, the void core is large, and a self-rotation is induced by transforming the radial monopole $2e$, to that of e , and $-e$ moving in phase thus producing an angular momentum which in turn must be canceled by the self-rotation of the mass shell, as the original 5D domain contains no momentum. It is this self-rotation that will provide a natural centrifugal force to prevent the masses to collapse into the gravity singularity [9]. But none-the-less, a very

massive star will still experience the gravitational inward force, thus resulting in a supernova. When that happens, the transforming of the monopole states within the core into angular momentum states, must break the DLRO of the monopole. This breaking changes it to two in phase with opposite charge sign circular currents. Such a pair of circular currents, then generate radial radiating pairs of photons with 180 degree off-phase, resulting in a $2h\nu/c$ graviton. In fact, this supernova graviton radiation from Supernova was observed [19] [20].

We have discussed the monopole with energy above $2m(e)c^2$, which are convertible into electrons and nucleons, yet conserving charge neutrality in the 4D Lorentz domain. That leaves us the low energy range $0 < 2h\nu < 2m(e)c^2$. In the analysis of the excitation from the Higgs' vacuum filled with Higgs' DLRO Bosons with all energy values, that the simple Bose distribution from the excitation of the vacuum will result in N being infinite at the lower limit $h\nu = 0$. Physically, this means the vacuum cannot be excited, at any temperature T . By that it can only mean all such 1D monopole states must be time frozen, and is a standing wave, or that it is in a closed loop, being achieved by two parallel and opposite wave propagation. It is the first one, that allows for such a standing wave to exist within a time frozen 4D space void core. For a carbon 12 nucleus, its dimension restricts the monopole frequency to exceed the electron rest mass correspondence. Hence, in order to accommodate the range we need quantum tunneling from C to C along a line to happen, which is okay, as the monopole is a DLRO Boson. Such a process for accommodating low frequency monopole states can be achieved by introducing a set of 4 nitrogenous bases. The fact that there is 4 and only 4 such possible bases, came from in obtaining a 2D plane out of a 4D space, we have $4!/2! = 12$, which must in turn obey the remainder 3D space orientation invariance. The length of the nitrogenous bases stacking out of all possible orderings, then gives us the structure of a RNA, with one of the nitrogenous base identified as the end cap, which two faces have different properties: namely, transmitting and the other non-transmitting. Since the stacking can be separated arbitrarily with none carbon base layers in between, such a DLRO monopole wave can have frequencies within the low range we desire. But it however does not produce a quantum flux of $h/2e$. On the other hand, if we combine two parallel RNAs, but replace the end cap nitrogenous base to one that not only reflects on one side but also reflects the monopole wave into the adjacent RNAi. The index "I" is meant to signal the end cap replaced. Under this result, we form a DNA. Although the choices of stacking are fixed for all DNAs, but due to the infinite choices of the separating gap layers, there are infinite different spectra possible. And this monopole wave completes a closed loop, hence always gives us the quantum flux $h/2e$. The flux quantization is vital, if cells in life forms derive its growth from matching the DNAs spectrum with the charge carriers in the cell go through an ODLRO superconducting phase transition [21].

Since the free charge carriers in a solid requires a periodic elemental structure, so that conduction and valence bands can be computed. One can generally

group the carrier properties as follows: 1) metal, where there is a partially electron orbital filled CB conduction band. In short, the Fermi level cuts through the conduction band. 2) A hole carrier conductor. There the Fermi level cuts through the VB the valence band, leaving a net fraction of VB orbitals vacant. The Cuprate high T_c ceramics belongs to this class of conductors. 3) A completely filled VB and a completely empty CB, separated by a small band gap energy G . Such a system is a semi-conductor, when electrons from VB are excited into CB. 4) When G is large compared with excitation energy available, it is an insulator. Actually even when excitation can be activated, the opposite charges left behind in VB and CB can bind by Coulomb potential and thus form a discrete exciton level within the band gap G . It will still be an insulator. 5) For the Cuprate ceramic having a partially filled VB [22], but still can excite a VB electron into the empty CB, and formed a localized exciton level within the band G . Such an additional localized atomic like exciton state adds to those of the Crystal ions, and hence increases the induced coupling between the hole carriers to form ODLRO Cooper pairs [23], thus substantially enhances the superconducting transition temperature T_c . Bio cells grow at a room temperature range. And such bio cells are usually consisted of a spherical shell, predominantly made of different proteins. Because of the spherical shell structure, bio cells all satisfy the periodic boundary condition, thus a band structure having distinct CB and VB must occur. Since all proteins contain carbons arranged in hexagon form. Such a hexagon coupled with carbon having outer atomic orbitals $n = 2$; $2p$ and $2s$, the 3 nearest C neighbors in fact will leave a partially filled VB “ p ” orbital band. A result is quite similar to the Cuprate HTS ceramic. The differences could very well be just quantitative. In YBCO, we have observed experimentally, that T_c can be substantially enhanced with UV light irradiation [24], which implies that the exciton within G , can be excited so that its binding raises closer to either CB or VB, depending on the relative effective masses of the CB and VB excited extra charges. It is this effect that makes the exciton polarization easier, we may then expect cells to drive its T_c transition into the room temperature range when EMF (Electromagnetic wave frequencies) are make available, internally in animals via neural spectrum, or in plants through photo synthesis. It is such EMF induced T_c phase transition that we consider as the bio coherent frequencies. EMF that do not induced the T_c transition in the cell structures are than classified as de-coherent. Many materials including common clay do process a range of EMF overlapping with both coherent and de-coherent frequencies. And it is not unexpected, as plants derive and form its proteins from absorbing from the soil which is of course clay dissolved in water.

3. The Chemical Periodic Table

The chemical periodic table is based on the Bohr’s model. To clearly understand let us consider the simplest two atoms H and Li. The atomic orbitals for H is $1s$, and for Li is $2s$. For Li, we have 3 protons and 2 neutrons in the nucleus. There-

fore, we must have 3 electrons also. Note all stable atoms are charge neutral and are Bosons, because they must be composed of even number of Fermions. If we ionized Li by removing the 2s orbital, the change in the atomic binding is $-R/2^2$, corresponding to an energy gain of $[1/4]R$. While if we consider the binding of the nucleus to the remaining 2, 1s orbitals after the outer 2s is removed, we have $2 \times [-2R] = -4R$. The factor $-2R$ comes from the effective nucleus charge seen by each 1s electron, after the outer 2s electron is removed, thus changing the Coulomb potential between each remaining electron with the nucleus. As compared to the non-ionized case, where we simply have $-2R$, due to Pauli Exclusion principle for the 2 1s electrons, since we must treat all 3 electrons as seeing the same Coulomb field, otherwise they are distinguishable, and the outermost orbital would not be 2s. There is an extra binding of $-2R$. This extra energy makes the total energy gain of $[9/4]R$. Hence resulting in a net change of $[9/4]R > [1/4]R$. Furthermore, the ionized Li is no longer a Boson, unless the nucleus lost a neutron also. The initial homogeneous 5D quantum representation only allows for a DLRO Higgs vacuum, making the retaining of Boson fields under excitation a quantum condition. According to thermal ensemble equilibrium condition: that always minimizes the energy value, the ionized Li state is unfavored. Including the Boson requirement, the elements in the periodic table must be formed right below the leptons, hadrons creation. With the energy shift dominated by the number of nucleons in the element. Meaning the atomic formation favors charge neutrality, and which means atoms are formed under simultaneous charge neutrality as electrons and nucleons are formed by the projections Po and P1, from the homogeneous 5D manifold into the 4D Lorentz manifold where they exist. It is interesting to see that this thermal energy difference corresponding to a value of $2R$ is an unfavored photon EMF shift of extra $2R$, as compared to the favored EMF shift of $[1/4]R$. Therefore this interesting charge neutrality condition can be seen as dividing the EMF spectra into coherent and de-coherent values in the chemical elements formation. Except for the chemical elements, the EMF spectra is more than two order higher than those of the bio cells molecules, such as water, given by Hans Geesink's papers. In fact the periodic table elements creation is distinctly a separate energy range below the leptons and hadrons formation obtained via the space reduction projections Po and P1, yet far above the bio EMF range. Making the presents of life forms on planets very restrictive and rare. Nonetheless the same coherent, de-coherent analysis for the much lower EMF spectra still remains, and applicable to the creating of bio-molecules, when the projected 4D space to 3D space symmetry can be further reduced to $2D \times 1D$ space as is the space symmetry for RNA and DNA. This restricts the planet's surface Temperature to a very narrow range governed by the liquid phase of water, as water together with carbon 12, and Hydrogen, in replacement to proton, neutron and electron in atoms, due to fractal representation play the most important key roles in the maintenance of Bose monopole DLRO for the bio EMF coherent spectra. {We like to mention the mass energy for Hydrogen as compared to water is 1/18, while the electron to

the proton is $1/64 = 1/4^3$, coming from 4 choices to select the 4th space coordinate to be projected onto the remaining 3 coordinates, and the power 3 is from the symmetry of the 3 remaining space coordinates. The increases of $(2/3)^2 \times 2^3$ times as the electron is replaced by Hydrogen, is due to breaking of 3D space symmetry to $2D \times 1D$, starting from a 5D homogeneous manifold. The $2/3$ factor comes from a 2D plane selected from 3D space; the square factor is from the quadratic Fermat's sum, while the 2^3 comes from the three orthogonal normals to the planes. We still need to define the 2D geometric form. On the carbon 12 nucleus surface, the form is given by the 3 hexagons. Each hexagon is formed by 3 equilateral triangles on one side as given in the nitrogenous bases, which in terms of the $SU(3)$ generators or carbon is given by $(2/3)^3$, so that the DLRO of the monopole bosons can be linked via quantum tunneling in order to extend the mapping to lower EMF values; while we have 3 such equilateral triangles, hence we have exactly $(2/3)^3 \times 3 = 8/9$; which then gives us Oxygen. As a result all bio lives are built from water, carbon, hydrogen plus oxygen.} Such Low EMF spectra derived for bio systems was first suggested by Schrödinger, and now extensively analyzed by many bio-physicists. The EMF obtained from water is based on the molecular rotation of 432 Hz, which is available only in the liquid phase, thus lives are limited to the water liquid phase Temperature range. In agreement with our Bose distribution approach as we divide the EMF value into separate ranges so as to connect the projected space symmetry to that of Perelman's Ricci-Flow and entropy mappings, and limiting the thermal requirement on the existence of Life forms on a planet. It is this stringent limitation that made Earth a rather unique planet within the solar system.

4. Analysis of the Bio-Cell EMF Spectra According to the EEM Theory for Its Growth

In a recent article by Geesink, Jerman and Meijer [25], the bio-cell's coherent EMF is given by

$$E(n, m, p) = h\nu(\text{ref})2^n 3^m (2^p) \quad (10)$$

where $\nu(\text{ref})$ is a cell specific frequency.

$$n = 0, 0.5, 2, 4, 5, 7, 8, -1, -3, -4, -6, -7.$$

$$m = 0, 1, 2, 3, 4, 5, -1, -2, -3, -4, -5.$$

$$p = < -4, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, > 52.$$

We have proposed a 5D model theory for Life [12] based on the EEM model [22] for inducing an ODLRO transition of the VB “ p ” holes within the bio cell, as it matches to the DNA spectra, which obey gauge quantization $h/2e$ from the DLRO monopole bosons in the life form. In this section, we shall try and explain why the EMF spectra given in Equation (10) are consistent with our model theory. First it is nice to observe that the EMF corresponding to the masses of H_2O and Carbon ratio is exactly 1 to $2/3$; (EMF of water: 432 Hz, see [25] for the EMF values) the same ratio as between proton and neutron quark masses, while

hydrogen fits exactly according to the electron to proton ratio computation, which is exactly $m(\text{H}_2) = m(q) \times 1/4 \times 2/3 \times 2/3$. The factors $2/3 \times 2/3$ comes from the SU(3) factor for carbon, and the remaining 1/4 comes from the choice of 4D space in Po projections, and reduced the 3D space symmetry into $2\text{D} \times 1\text{D}$ as required by the formation of DNA. $m(q)$ corresponds to the EMF frequency of Water. As such, these 3 elements, water, carbon and hydrogen are the only basics that are in all bio matters; as only proton, neutron and electron are for the entire periodic table of chemical elements. Oxygen however, would correspond to 8/9 of water EMF. This is not a basic SU(3) derived fundamental. However it does correspond to 3 carbons in product geometry, a very interesting arrangement present in all the nitrogenous bases. Perhaps that makes Oxygen vital to the creating of spectra matching between those from the DNA and the ODLRO of carriers in the bio cells?

In order that an ODLRO transition on the bio cell's hole carriers can occur in match to the DLRO monopole bosons spectra for the gauge loops of the DNA, a band structure with empty CB and partially filled VB with "p" holes, must be established for the bio cell. All bio cells have a spherical surface covered with proteins. Thus the surface satisfies the periodic boundary requirement for the existence of a band structure. As all proteins contains hexagonal carbon structures, and with the $n = 2, 2p, 2s$ outer orbitals for Carbon, the hexagon structure will give rise to a partially filled "p" orbitals as the Fermi level cuts through the VB, and depending on the rest an empty CB, separated from VB with a positive band gap G . Such a band structure resembles the YBCO HTC band structure [22]. The physical meaning from such a band structure, is that in the normal phase, it is a hole type conductor. Except this band structure might not be the lowest energy configuration. Because when an extra VB electron is excited into the empty CB, it requires $E_f + G$ energy, while these pair of opposite charge sign particles will bind with Coulomb potential forming a bound exciton state. Such an exciton brings down the excitation level to $E_f + G - E'(ex)$. Depending on the relative masses of the CB electron and the VB hole. And as $E'(ex)$ cancels G , the exciton will disintegrate. Thus there are two possibilities, one from $E'(ex)$ to be just above VB, and two for $E'(ex)$ to become 0, or at the bottom of CB. We may denote these two conditions by an absolute energy $|dE'(ex)|$ measured from either the VB top, or the CB bottom. Obviously $|dE'(ex)|$ is given by $\hbar\omega(ref). F(n)$, where $F(n)$ is a function of the quantum orbital levels of the exciton. On the cell's surface, the exciton can neither be like a 2D Bohr atom, or a 3D Bohr atom. Therefore more accurately $F(n)$ is a combination of $F(n; m - 1/2)$, and n, m are integers excluding 0. Such that

$$E'(ex) = a \frac{R}{n^2} + b \frac{R^*}{(m - 1/2)^2} \quad (11)$$

where n, m are \pm integers, except 0. R and R^* are the respective Rydberg constants. a, b are the dimension mixing. The above $E'(ex)$, can be rewritten as

$$E'(ex) = 4 \left\{ \frac{aR}{(2n)^2} + \frac{bR^*}{(2m-1)^2} \right\} \quad (12)$$

The correct $E'(ex)$ in the EEM theory is given in Equation (6) of ref. [26].

This expression nonetheless shows that the $E'(ex)$ levels are a mixture of even and odd integers. However they are NOT the n, m powers shown in Equation (10). We use the same notations just to show that there is always a match to the DNA spectrum possible. They simply represent two infinite sets of DLRO bosons that can be coupled to the “ p ” hole carriers to induce the ODLRO transition, so as to match the DNA spectra. We refer to ref. [26] for a more accurate discussion on $E'(ex)$. As excitons formed, an internal Coulomb pressure arises, which collapses the band gap G , from eV to only order of 10^{-7} eV. The smaller the effective G^* is, the larger will be the induced ODLRO $E(ex)$ becomes. The photon frequency corresponding to $G^* = 10^{-7}$ eV. is roughly $10^{-3} G^*$ according to the numerical fitting results in [26], hence in the 100s Hz range, matching the data shown in [25]. In fact, as G^* is so small, the discrete $E'(ex)$ levels becomes continuous and these excitons mathematically becomes similar to the monopoles within the Higgs’ vacuum, with frequencies in the 100s of Hz. And the induced hole-hole pairing obeys the SU(3), SU(2) symmetries exactly like the elements periodic tables we obtained from the Gell-Mann standard model. And the function $F(n; m-1/2)$ becomes $F'(2n; 2m+1)$, where n, m are all plus and minus integers. Since F represents $|dE'(ex)|$ it represents the EMF induced infinite possible number of $E'(ex)$ level to level transitions. Hence $F(n, m)$ with matching to the DNA can become roughly $Eo2^{-n}3^{-m}$. As any integer powers of 3 remains odd, and all but 0 powers of 2 is even, thus satisfies $E'(ex)$.

The EEM induced ODLRO binding energy gap $E(ex)$ which is due to the energy saving by the hole-hole pairing is thus given by matching those of the DNA:

$$E(ex) = \frac{Ef^2}{F(n, m)} \cong hw(ref)2^n3^m \quad (13)$$

See [27] for $E(ex)$ solution.

The $EfEf$ term comes from the energies of the hole pairs on the Fermi surface, while $F(n, m)$ is in the denominator is a second order perturbation correction to the total Cooper pair energy. Due to 5D projection, $E(ex)$ match to the DNA spectra must retain the SU(3) and SU(2) geometry symmetry, as we saw in Water and Carbon. Of course, $E(ex)$ is only part of the Cooper pair binding gap. The total binding gap must include the phonon induced BCS term. Giving us the total superconducting transition gap

$$E(S) = \left\{ E(\text{phonon})^2 + E(ex)^2 \right\}^{1/2} \quad (14)$$

The phonon induced gap $E(\text{phonon})$ does not have quantum levels and is a pure constant, which we can assign as the power $n = 0$ from the 2^n EMF spectra. With these two orthogonal sum terms for $E(S)$, and the exciton state is domi-

nated by the 2D atomic spectra, with the 3D fraction $a \ll b$ and also depends on the level n , plus the + and - series difference due to the CB and VB carrier masses in assigning $F(n; m)$ we can get to the same results as observed by Geesink *et al.* except for $n = 0.5$. Such a spectrum can only be associated to the $E(\text{phonon})$ gap component as applied to the CB electrons, as the 3D exciton ground state energy behaves like the ionic mass in the BCS electron superconductor. The T_c depends roughly as a function of N_f/N_f , where N_f is the Fermi level hole density before the excitation of creating exciton and Cooper pair. The smaller this ratio, the higher the T_c . It is experimentally verified as the T_c isotope dependence [26].

The highest T_c found in HTC ceramics is around 125K. In order we have T_c in the room temperature range requires a 50% increase from the ceramics. Hence this can occur if the water rotation states given in Equation (10), in T above freezing contributes at least equally to that from the Excitonic gap. Implying water EMF plays a significant role in inducing the growth of bio cells.

Lastly, the EMF series (2^p), with symmetry between + and - p integers could very well be from the rotational states of water molecules on the cell, that can separately induced a Cooper pairing of the VB hole carriers, without the formation of a localized exciton. And due to second order perturbation correction we get a third E(S) gap enhancement, on top of those of the lattice phonon coupling, hence is nearly 3D symmetric.

A completely microscopic superconductivity field theory based on EEM was published and compared extensively to results of many different HTC cuprate ceramics [22] [23] [26]. It was also found that by UV light irradiation on a YBCO thin film, and creases N_f and the T_c value is substantially increased [24]. This result and the EMF (2^p) series shows both the T_c enhancement to bio cells, leading to growth by the presence of EMF coming from photon energy within the life form body, and the presence of water molecules on the bio cell are essential.

5. Conclusion

We have briefly reviewed all physical results derived from the dimension reduction mappings from the homogeneous 5D space-time Universe into 4D Lorentz space-time domains where all matters exist. Starting with the creating of the BE condensed Higgs' vacuum, filled with Maxwell's Bose magnetic monopole states, to the realization of the electro-weak leptons, the Gell-Mann Quark model with gauge confinement has led to the 8-fold way hadron results, and proved the McGlenn theorem [28] to be valid and compactable when matters were derived from the 5D projections onto the 4D Lorentz space-time domain. And then by applying the thermal ensemble mathematically, we bridge the quantum picture on mass creation into the classical Perelman-Ricci-flow and entropy mappings, so as to obtain the creation of galaxies, stars and planets within each separated 4D Lorentz domain. The point we missed in our previous papers on these topics is the mathematical importance that monopole states are of DLRO and are along

“ r ” of the Fermat’s radius, an entangled dimension. Therefore, in the homogeneous 5D, we have a vacuum filled with BE condensed monopole states, as suggested by Higgs. Because of this entangle variable, it is possible to retain charge neutrality at all time, when projections, or excitation of the monopole fields were applied. As negative electrons are simultaneously created with equal number of positive protons, it fixes the bare quark mass at 32 MeV. As compared to the electron rest mass of 0.5 MeV: a result not deducible from the Quark model or is expected. Through these results, we learn that all creations including lives are derived from excitation of the 5D Higgs’ vacuum of BE condensed DLRO monopoles, into DLRO matter structures composing of electrons and nucleons, making up elements of the periodic table. While for even lower energies, elements condensed into solid structures, which converts its atomic orbitals into band structures, and nucleus motion into vibrating phonons. Eventually at even lower monopole energies, the excitations form 2D hexagon carbon structures, including clay, fats, proteins, and leading to nitrogenous bases. Through stacking these bases in all possible ways produces RNA, allowing the DLRO monopole field via quantum tunneling to satisfy the boundary condition of the low frequencies states. Similar to the creating of nucleons from quarks by imposing gauge invariance, the DNA for life forms emerges. Because of all these natural mapping steps, the 5D homogeneous energy-momentum manifold is divided into different ranges as a function of temperature T by keeping the $2\hbar\nu(o)/kT = C$, a set of constants in satisfying the quantum to Perelman mappings relation. It is this $\nu(o)$ spectra and its gauge quantized restricted condition, that separates into coherent and de-coherent for life forms, that is being studied by Geesink and many others. The coherent spectra are the spectra responsible for cell growth. And based on the EEM model we suggested, it must then be governed by the bio charges, which are mainly unfilled “ p ” orbitals derived from carbon in the hexagon structures of proteins covering all cells, thus related to the photon energy induced exciton spectra, in the band gap that creates the ODLRO phase transition of these “ p ” hole carriers, matching those of the DNA, hence giving us the cell growth, as we discussed. The part that we have not discussed is how the photon inducing source comes about in the bio systems. For vegetations, it is photosynthesis. For animal lives, it has to be from internal. Obviously, there are much more possible channels. Error in the spectra generated will result in cancerous growth. Again its causes are many, from the DNA to the neuro-signals.

Acknowledgements

We like to thank Professor Hans Geesink for many private communications and providing us with his recent preprints. And we sincerely thank Ms. Winnie So for typing and careful review of the manuscript.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Aczel, A.D. (1997) *Fermat's Last Theorem: Unlocking the Secret of an Ancient Mathematical Problem*. Penguin Press, London.
- [2] Maxwell, J.C. (1865) *Philosophical Transactions of Royal Society of London*, **155**, 459-512. <https://doi.org/10.1098/rstl.1865.0008>
- [3] Wong, K.W., Dreschhoff, G., Jungner, H., Fung, P.C.W. and Chow, W.K. (2018) *Physics Essays*, **31**, 493-495. <https://doi.org/10.4006/0836-1398-31.4.493>
- [4] Gell-Mann, M. (1964) *Physical Review Letters*, **12**, 155-156. <https://doi.org/10.1103/PhysRevLett.12.155>
- [5] Wong, K.W., Dreschhoff, G. and Jungner, H. (2014) *The Five Dimension Universe: A Creation and Grand Unified Field Theory Model*. Scientific Research Publication.
- [6] Higgs, P.W. (1964) *Physical Review Letters*, **13**, 508-509. <https://doi.org/10.1103/PhysRevLett.13.508>
- [7] Perelman, G. (2002) *The Entropy Formula for the Ricci Flow and Its Geometric Application*.
- [8] Perelman, G. (2003) *Ricci Flow with Surgery on Three-Manifolds*.
- [9] Fung, P.C.W. and Wong, K.W. (2015) *Journal of Modern Physics*, **6**, 2303-2341. <https://doi.org/10.4236/jmp.2015.615235>
- [10] Fung, P.C.W. and Wong, K.W. (2017) *Journal of Modern Physics*, **8**, 668-746. <https://doi.org/10.4236/jmp.2017.84045>
- [11] Wong, K.W., Fung, P.C.W. and Chow, W.K. (2019) *Journal of Modern Physics*, **10**, 557-575. <https://doi.org/10.4236/jmp.2019.105039>
- [12] Wong, K.W., Fung, P.C.W. and Chow, W.K. (2019) *Journal of Modern Physics*, **10**, 1548-1565. <https://doi.org/10.4236/jmp.2019.1013103>
- [13] Frohlich, H. (1968) *International Journal of Quantum Chemistry*, **2**, 641. <https://doi.org/10.1002/qua.560020505>
- [14] Geesink, H.J. (2020) *Proposed Informational Code of Bio Molecules and Its Building Blocks: Quantum Coherence versus Decoherence*.
- [15] Geesink, H.J.H. and Meijer, D.K.F. (2018) *Journal of Modern Physics*, **9**, 898-924. <https://doi.org/10.4236/jmp.2018.95056>
- [16] Wong, K.W., Dreschhoff, G. and Jungner, H. (2012) *The J/Si Meson and the Missing Baryon Octet*.
- [17] Wong, K.W., Dreschhoff, G. and Jungner, H. (2012) *Journal of Modern Physics*, **3**, 1450-1457. <https://doi.org/10.4236/jmp.2012.310179>
- [18] Einstein, A. (1916) *Annalen der Physik*, **49**, 769. <https://doi.org/10.1002/andp.19163540702>
- [19] Goldstein, A., *et al.* (2017) *Astrophysical Journal Letters*, **848**, L14. <https://doi.org/10.3847/2041-8213/aa8f41>
- [20] Chen, X.D., *et al.* (2019) *Nature Astronomy*, **3**, 320-325. <https://doi.org/10.1038/s41550-018-0686-7>
- [21] Wong, K.W. and Ching, C.W. (1989) *Physica C*, **158**, 1-14. [https://doi.org/10.1016/0921-4534\(89\)90294-3](https://doi.org/10.1016/0921-4534(89)90294-3)
- [22] Ching, W.Y., Xu, Y.N., Zhao, G.L., Wong, K.W. and Zandiehnam, F. (1987) *Physical Review Letters*, **59**, 1333-1336. <https://doi.org/10.1103/PhysRevLett.59.1333>
- [23] Wong, K.W. and Ching, W.Y. (1989) *Physica C*, **158**, 15-31.

[https://doi.org/10.1016/0921-4534\(89\)90295-5](https://doi.org/10.1016/0921-4534(89)90295-5)

- [24] Wong K.W. and Curatolo, S. (2008) EEM: The Excitonic Enhancement Mechanism Theory and Experimental Evidence of Optically Enhanced in High Tc Superconductors. In: *Progress in Superconductivity Research*, Nova Science Publishers, Inc., Hauppauge, 55-78.
- [25] Geesink, H.J.H., Jerman, I. and Meijer, D.K.F. (2020) Clay Minerals Information Network Linking Quantum Coherence versus Decoherence and First Life.
- [26] Wong, K.W., Fung, P.C.W., Yeung, H.Y. and Kwok, W.Y. (1992) *Physical Review B*, **45**, 13017-13024. <https://doi.org/10.1103/PhysRevB.45.13017>
- [27] Wong, K.W. and Ching, W.Y. (2004) *Physica C*, **416**, 47-67. <https://doi.org/10.1016/j.physc.2004.09.003>
- [28] McGlenn, W.D. (1964) *Physical Review Letters*, **12**, 467. <https://doi.org/10.1103/PhysRevLett.12.467>