

*Quantum Astrophysics General Formalisms Theoretical to Experimental Gaging*

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**PUBLISHABLE FUTURISTIC TRENDS OF PHYSICAL SCIENCES CHAPTER 2023**

## **ABSTRACT**

*The author has summarized the PHYSICS gist of advances made in the last decade having back to the blackboard examination of the inconsistencies within major branches, especially quantum and relativistic mechanics quantifying quantum astrophysical nature with physical process mechanism operating universe or universes concomitantly. Most of the PHYSICS formalisms theoretical mathematical modeling results the author has peer-published highlights have been emphasized providing wide variety of graphics to conceptualize as well as establish explanations on a broader basis. Specifically, original Helmholtz point decomposition fields modeling Iyer Markoulakis matrix formalisms that have been thereby successfully gaged having “Stringmetrics” formulation to explain fermionic fields gradient working conjunction with particle vortex fields to proceed problem solving mechanics. The author has advanced further to identify mechanisms that operate at the Planck quantum level such as Hod-PDP rotational circuit “perpetual motion machine” like assembly to generate particles from Superluminal turbulent “Superfluids” quagmire universal noisy Plenum having perhaps monopole activated energies. Space-time surfaces compressed quantum with dipole magnetism forming to show electric tensors keeping the space fields quanta that are measurable with Poynting vectors have been graphically demonstrated. Algorithm Graphics PHYSICS matrix operationally quantifiable formulae have been thoroughly derived basically out from first principles quantifying Hamiltonian Hermitian Higgs Coulomb gaging to arrive wavefunction, eigen spinors, signal/noise point-to-point metrics correlating with PHYSICS literature observational measurements results. Numerical achievements with operational mechanisms that are applicable for ongoing analytical modeling experimental parameters practically tabulations well discussed to take PHYSICS directionally to proper perspectives with unifying concepts having gage unitarization normalization procedures have been expounded to greater detail. The author has ansatz model introduced switches-states metrics to classify, observe, measure, analyze, and extend Standard Model metrics of charge, spin, parity, color, flavor, mass gage, and the coupling parameters to particle PHYSICS dynamic characterizations.*

*Progressively, the author has devised techniques with methodology to demonstrate analogous transform theoretical to macroscopic simple examples of applied problem-solving physics normal observables experimentation measurement schema. Quantum Gravity Modified Newtonian Dynamics PHYSICS Discontinuum Modeling of Nonlinear Time Rotational Space Gauge Fields Algorithm Numeration Matrix that are computer simulation programmable metrics have been originally developed by general transforms having Lagrange, Hamiltonian, Laplace, Legendre, Fourier, and Jacobian mathematical transforms have been incorporated to generalize universal observer physics black-box nature.*

*Prototype set-ups, figures, variable measuring instrumentation systems feasible Experimental Designs sketch graphical blueprint engineering technological advances that the author has achieved have been layout explained. PHYSICS results from computer programming of matrix value numerical Algorithm IT coding with short discussions that the author has accumulated over these years are highlighted. Strong gravity versus weak gravity thesis PHYSICS quantifying gravitational physics dense fibers transforms propositions with synthesis of strong and the weak interactive particle spectra of vacuum baryons, quark-gluon-plasma, with gravitonic mesons evolution processes as well as Planck Quantum Point PHYSICS Vortex Gradient Fields Structures have been extended to explain how unifying field particle theories may be achieved eventually.*

## INTRODUCTION

*We will start briefly elucidating the history of PHYSICS, specifically the role of PHYSICS, particularly theoretical practically deriving experimentally provable verifiable observables. Since that is extensive thesis having large number of references, listing literature surveys are given at the end and no referential aspects like a paper article will be attempted here to make it like review editorial that will help reader to understand material without having to constantly refer every paragraph. Here, the chapter thesis represents a very short compilation of key PHYSICS progressively advanced by scientists, especially physicists who are Nobel Laureates. History of physics summarized here spans over three centuries of careful theoretical and experimental scientific physics works with in-depth thought, philosophy, logic, practical sense, painstakingly keen observations objectively, clever instrumentation measurements with precision and extreme accuracies, as well as hypothetical testing, proof, verifications, with mathematical abstractness, as well as physical clarity.*

*Progressive understanding of PHYSICS starting with Galileo, then Newton and other scientists eventually extended one-dimensional descriptions to more than one dimensional to conform to proper geometry of universe. Three-dimensional Euclidean geometric PHYSICS helped to understand natural processes; however, space-time required four-dimensional topology and then manifolds of higher dimensions necessitated with String and Super String theories. Still, there had been many questions and paradoxes unanswered, although basic geometric physics was extended to higher dimensional matrix tensor forms. Classical PHYSICS*

manifesting energy and matter successfully quantifiably formulated conservation of energy and entropy, stating a set of principles that describe how energy and entropy behave in thermodynamic systems. Statistical mechanics quantified entropy, measuring the degree of the disorder or randomness in a system, within the form  $S = k \cdot \ln W$ , where  $S$  is the entropy,  $k$  is the Boltzmann constant,  $\ln$  is the natural logarithm, and  $W$  is the number of microstates. This equation additionally showed that entropy to be a measure of uncertainty or information content of a system helped to define arrow of time. The higher the entropy, the less information we might gather about the exact state of the system and could be used as also measure of information loss or noise in a communication process.

## Maxwell's equations

Maxwell's equations:

$$\begin{aligned} \nabla \cdot \mathbf{D} &= \rho_v \\ \nabla \times \mathbf{E} &= -\frac{\partial \mathbf{B}}{\partial t} \\ \nabla \cdot \mathbf{B} &= 0 \\ \nabla \times \mathbf{H} &= \mathbf{J} + \frac{\partial \mathbf{D}}{\partial t} \end{aligned}$$

Where;

$\mathbf{E}$  = electric field intensity  
 $\mathbf{D}$  = electric flux density  
 $\rho_v$  = electric charge density per unit volume  
 $\mathbf{H}$  = magnetic field intensity  
 $\mathbf{B}$  = magnetic flux density

Maxwell provided electromagnetic light mathematical field theory with these equations that describe how electric and magnetic fields might get generated and interact with each other as well as with electric charges and currents. One of the key results that became cornerstone of Einstein's Special Theory of Relativity and equivalence principle was constancy of the speed of light:  $c = 1/\sqrt{\mu_0 \epsilon_0}$ , which is equal to the speed of light measured by experiments, with  $\mu_0$ : permeability of free space and  $\epsilon_0$ : permittivity of free space. Maxwell's theory laid the foundation for modern physics and technology, such as radio, television, radar, lasers, fiber optics, wireless communication, and transmitting-receiving information waves.

Quantum Mechanics was developed by many 20<sup>th</sup> century physicists, like Planck, Bohr, Einstein indirectly, Schrödinger, Pauli, Dirac, and Heisenberg. Quantum physics had brought out that physical quantities, such as energy, momentum, angular momentum, electric charge, and particle spin can only take discrete values, called quanta. Quantum physics also further introduced concepts of wave-particle duality, uncertainty principle, superposition principle, entanglement, and many others that challenge the commonsense notions of reality, historically traced back to Kirchhoff's discovery of black body radiation. Planck quantized light in the units of  $hf$ , where  $h$  is Planck's constant, and  $f$  is radiation frequency, explaining observed distribution of radiation emitted by a hot object, which could not be accounted for by classical physics.

In 1905, Einstein extended Planck's idea to explain the photoelectric effect, which Einstein quantified to be emission of electrons from a metal surface when exposed to light photons. In 1913, Bohr developed a model of the hydrogen atom that incorporated both classical and quantum physics. He postulated that electrons could be jumping from one orbit to another

by absorbing or emitting photons with energy equal to the difference between the orbital energies, especially with hydrogen atom energy levels correlating experimental observations. Schrödinger and Heisenberg in 1925-1926 independently formulated two equivalent versions of quantum mechanics: wave mechanics and matrix mechanics. Heisenberg introduced a matrix representation of physical observables and their commutation relations of uncertainty principle which stated about a fundamental limit to how precisely one might measure two incompatible observables, such as position and momentum via equation:  $\Delta x \cdot \Delta p \geq h/4\pi$ , where  $\Delta x$  = positional change,  $\Delta p$  = momentum change measurements having uncertainty at least  $h/4\pi$ , with  $h$  = Planck's constant. It further also implied that there would be a fundamental limit to how much information, in terms of quantum probabilities one might extract from a quantum system, and that some information might get irretrievably lost in the process of measurement. Pauli proposed an exclusion principle stating that no two identical fermions (particles with half-integer spin) can occupy the same quantum state in a system. Dirac thereby combined quantum mechanics with special relativity to obtain a relativistic wave equation of the electrons, predicting antimatter existence possibility and explained electron spin processes.

Einstein's Special Theory of Relativity showed that space and time wouldn't be absolute, but relative to the state of motion of the observer. It also quantified mass-energy equivalence, according to the famous equation  $E = mc^2$ , where  $E$  = energy,  $m$  = mass, and  $c$  = speed of the light. General relativity tried to quantify theory of gravity that Einstein postulated after the Special Relativity Theory between 1907 and 1915, based on the principle that gravity was a consequence of the curvature of space and time caused by the presence of mass and energy. General relativity showed equivalence principle that effects of gravity to be having same as effects of acceleration, and that light could be bent, redshifted, or blue shifted on passing near massive objects. It also predicted new phenomena, such as gravitational waves, gravitational lensing, black holes, and gravitational time dilation. GRT explained many phenomena that could not be accounted for by classical physics, such as the precession of Mercury's orbit, the deflection of starlight by the Sun, the expansion of the universe, and the existence of cosmic microwave background radiation. One of the consequences of Einstein's General Theory of Relativity was predicting presence of black holes as extreme regions of gravity, having the event horizon boundary, marking the point of no return for anything that might cross it; they emit x-rays and gamma rays, that might be observed by telescopes. Black holes might often distort the light from distant stars and galaxies, creating a phenomenon known to be gravitational lensing. The first image of a supermassive black hole was taken in 2019 by the Event Horizon Telescope, showing black hole at Messier 87, a giant elliptical galaxy about 55 million light-years away. Black holes might in general emit gravitational waves, due to ripples in space-time caused by accelerating masses, produced when two black holes merge, or when a black hole collided essentially with another compact object, such as a neutron star.

Hawking radiation would be theoretical phenomenon of black holes emitting thermal radiation, reducing their mass and energy over time, identified to be black body spectrum. Hawking had shown that temperature of a black hole to be inversely proportional to its mass, so smaller black holes might be hotter and emit more radiation than larger ones, quantitatively:

$$T_H = \frac{\hbar c^3}{8\pi G M k_B} \text{ where } T_H = \text{Hawking radiation temperature, } \hbar = \text{reduced Planck's}$$

constant,  $c = \text{speed of light}$ ,  $G = \text{gravitational constant}$ ,  $M = \text{mass of the black hole}$ , and  $k_B = \text{Boltzmann constant}$ . Schwarzschild quantified the blackhole event horizon by the formula:  $R_s = 2GM/c^2$  where  $R_s = \text{Schwarzschild radius}$ ,  $G = \text{gravitational constant}$ ,  $M = \text{mass of the black hole}$ , and  $c = \text{speed of light}$ . The spin and the charge of the black hole might affect the event horizon. Hypothetical black holes having very small masses and sizes, possibly as small as the Planck scale (about  $10^{-35}$  meters and  $10^{-8}$  kilograms) would be categorized as microblackholes, possibly created in the early universe or by high-energy collisions of particles, occurring in particle accelerators or cosmic rays. Zero-point vacuum per quantum field theory of vacuum state would be the lowest energy state of a quantum system. Microblackholes created by the fluctuations of the zero-point fields could be sources or sinks.

The Standard Model Particle PHYSICS consists of two main components: the matter particles and the force particles. The matter particles are the basic building blocks of matter, and they belong to two groups: quarks and leptons. There are six types of quarks (up, down, charm, strange, top, and the bottom) and six types of leptons (electron, muon, tau, and their corresponding neutrinos). Quarks and leptons come in three generations, with increasing mass and decreasing stability. Quarks also have a property called color charge, that determines how they interact with strong nuclear force. The force particles are the carriers of the four fundamental forces: the electromagnetic force, the strong nuclear force, the weak nuclear force, and gravity. The electromagnetic force is mediated by light photons, which are massless and have no electric charge. Strong nuclear force is mediated by gluons, which are also massless and have no electric charge, but have color charge. The weak nuclear force is mediated by W and Z bosons, which are massive and can be electrically charged or neutral. The Higgs field is a quantum field that fills all of space and gives mass to other particles through its interactions with them. The Higgs boson was predicted by the Standard Model in 1964, but it was only discovered in 2012 by the Large Hadron Collider at CERN laboratory.

Penrose has proposed Conformal cyclic cosmology that suggests that the universe undergoes infinite cycles of expansion and contraction, with each cycle ending with a Big Bang and beginning with a Big Crunch. Penrose also interprets quantum mechanics to explain the collapse of the wave function because of gravity by superposition of quantum states cannot be maintained beyond a certain threshold of energy difference of one Planck mass, where gravity becomes unstable and causes a spontaneous reduction of the wave function. Penrose process. This describes a mechanism allowing an observer to extract energy from ergo sphere of a rotating black hole.

Parisi has proved spin glass has spins that point in different directions and can change their orientation over time, having magnetic atoms of iron mixed tonon-magnetic copper. The magnetic atoms are randomly distributed in the metal lattice, and they interact with each other through both ferromagnetic and antiferromagnetic bonds. They are models for studying other complex systems, such as neural networks, optimization problems, biological evolution, and social networks.

## **Highlights of Ansatz Iyer Markoulakis advanced to IMMOHZT HodPDP PHYSICS**

*Iyer Markoulakis point Helmholtz decomposed field theoretical modeling is a complex and advanced topic in physics and mathematics that involves the use of Helmholtz Hamiltonian mechanics to describe the dynamics of electromagnetic fields and particles. It is based on the idea that any vector field can be decomposed into a curl-free component and a divergence-free component, which are called the gradient field and the rotation field, respectively. The gradient field is a field that points in the direction of the maximum increase of a scalar function, such as the potential energy or the temperature. The vortex field is a field that has zero divergence and nonzero curl, meaning that it has no sources or sinks, but it has rotation or circulation. This is known as the Helmholtz decomposition or Helmholtz representation. Ansatz Iyer Markoulakis formalism uses the Helmholtz decomposition or Helmholtz representation to express any vector field as a sum of a gradient field and a vortex field. It also uses a 2x2 eigen tensor matrix to describe the dynamics of these fields and their interactions with point vortices and gradient fields, which can model the behavior of monopoles, electrons, positrons, and other quantum phenomena. The Iyer Markoulakis formalism is a mathematical framework that aims to unify the four fundamental forces of nature: gravity, electromagnetism, strong nuclear force, and weak nuclear force. The formalism extends the Coulomb-Hilbert gauge, which is a way of choosing the electric potential and the magnetic potential to simplify the Maxwell equations, to include the Higgs mass field, which is a scalar field that gives mass to elementary particles. The formalism also uses asymmetric string metrics, which are mathematical objects that describe how distances and angles are measured in curved spacetime, to account for the asymmetrical forces between magnetic poles. The Iyer Markoulakis formalism has potential applications for quantum supercomputing, quantum astrophysics, and grand unification theories. Monopoles, if they exist, could be used as qubits because they have two possible states: north or south, and these states could be manipulated by applying electric or magnetic fields, or by exchanging photons with other monopoles; otherwise, they can be entangled with each other through their magnetic interactions. They can offer some advantages over other qubit implementations, such as longer coherence times, higher scalability, and lower noise.*

*Iyer Markoulakis Malaver O'Neill Hodge Zhang Taylor gage discontinuity dissipative "Stringmetrics" Hod PDP Helmholtz decomposed point fields PHYSICS is a theoretical framework that tries to unify the four fundamental forces of nature using Helmholtz decomposition and asymmetric string metrics. The framework also uses asymmetric string metrics, which are mathematical objects that describe how distances and angles are measured in curved spacetime, to account for the asymmetrical forces between magnetic poles. The Hod-PDP mechanism proposes that these particles can form stable or unstable combinations, such as dipolar pairs, loops, strings, or bundles, depending on their relative orientations and distances. Emergent quantum Hod-PDP mechanism is a very advanced and complex topic in physics and mathematics that requires further research and verification. Potentially it proposes applications for quantum supercomputing, quantum astrophysics, and grand unification theories.*

# Statement of the problem

While quantum mechanics quantum field theory tries to link micro to macro physics, special general theory of relativity posits macro micro physics. However, discrepancies arise with evaluating parametrically quantum mechanics with relativity theory, especially at the vacuum energy solutions, leading to vacuum as well as ultraviolet catastrophes. These inconsistencies within major branches, especially quantum and relativistic mechanics quantifying quantum astrophysical nature with physical process mechanism operating universe or universes would necessitate ansatz novel approaches to problem solving PHYSICS. Space variables of the distance metrics tend to be discontinuous, hence no monotonic functionality may exist. The mass factor has always been a problem, especially with the well-defined Yang–Mills existence and mass gap situation, that is still an unsolved problem in mathematical physics pointing to mathematics.

# Solution of the problem

The author elucidates here sections with roadmaps to address the solution of the problem. Observer physics has been advanced to emphasize the role of conscious observer perspectives playing the key role determining observations measurements wholly. Essentially putting together {timeline, worldline, state-of-the-clock, environment, consciousness} operator with input, dynamic system quaternion imaginary throughput, Boolean binary output process nature is quite conceivable. Perhaps, this is how computer perceives like matrix theoretical physics synthesis of point universal pattern lattice emergence evolving!! Starting off with micro “Quantum Gage Point Tensor Field Theory” on imaginary quaternion aspects, real formalisms having gage physical transformations that will involve fields sense-time-space five dimensional aspects, the following physics formalisms have been expertly peer published already. In this Chapter, this will be in gist discussed briefly.

✓ **Ansatz Iyer Markoulakis PHYSICS FORMALISM:** 
$$\begin{pmatrix} \hat{\mathcal{E}}_{r,\mu\nu} & \hat{\mathcal{E}}_g^{\mu\nu} \\ \hat{\mathcal{E}}_{g,\mu\nu} & \hat{\mathcal{E}}_r^{\mu\nu} \end{pmatrix} \quad (1)$$

**Helmholtz decomposed point S2 matrix, having {gradient, vortex} space parity fields.**

To get eigenvalues of characteristic field matrix above, we equate  $|A-\lambda I| = 0$ ; hence

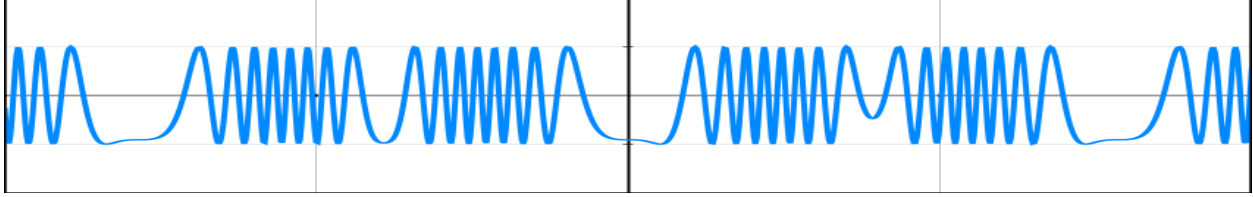
$$\begin{pmatrix} \mathcal{E}_{r,\mu\nu} - \lambda & \mathcal{E}_g^{\mu\nu} \\ \mathcal{E}_{g,\mu\nu} & \mathcal{E}_r^{\mu\nu} - \lambda \end{pmatrix} = 0 \text{ \& solving quadratic equation in } \lambda:$$

$$\lambda^2 - (\mathcal{E}_{r,\mu\nu} + \mathcal{E}_r^{\mu\nu})\lambda + (\mathcal{E}_{r,\mu\nu}\mathcal{E}_r^{\mu\nu} - \mathcal{E}_{g,\mu\nu}\mathcal{E}_g^{\mu\nu}) = 0 \quad (2)$$

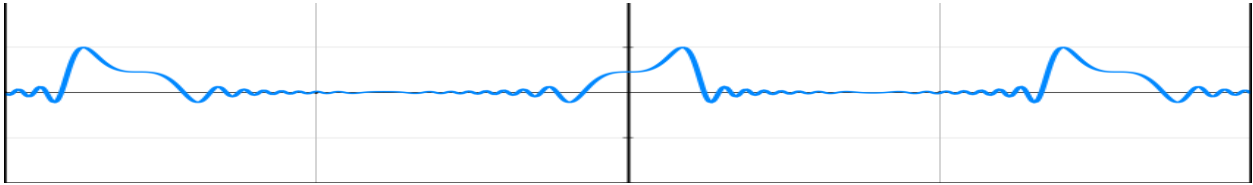
eigenvalues will have characteristic eigenvalue solutions.

The author has shown signal/noise graphing using the above Iyer Markoulakis Physics fields point formalism to problem solving vortex energy function for attractive-repulsive energy fields to get graphic following plots. Figures 1 and 2 graphically demonstrate the effect of the

vortex fields on the vacuum fluctuations. High energy density signal localized events manifest superluminal super-fluids reflecting at the boundary of the hydrodynamic like vortex rotational energy sustains Hamiltonian oscillators generating pulses, with damped oscillations as sinusoidal nonlinearity per Figure 1. It is possible to identify in Figure 2 regions of superluminal wave velocities of super-fluids, characteristically frictionless motion, without viscous flow.



**Figure 1:** Graph showing vortex generators of sinusoidal pulse signals. Here, X: vortex action function; Y: sinusoidal signals, per modeling analyses using vortex form available online.



**Figure 2:** Graphing repulsive-attractive distance & distribution profile with equivalent wave velocity in vacuum space vortex quanta, using values of the electric constant  $= 8.85418782 \times 10^{-12} \text{ m}^{-3} \text{ kg}^{-1} \text{ s}^4 \text{ A}^2$ , and magnetic constant  $= 1.25663706 \times 10^{-6} \text{ m kg s}^{-2} \text{ A}^{-2}$ , applied to the Figure 1 signals graphically per Iyer Markoulakis formalism and online available tools.

**Inference of Wavefunction collapse within micro-wormhole:** Quantum manifolds linking to global vacuum space to astrophysical relativistic macro-space, short-cut path of microwormhole are possible due to collapsing wavefunction inferable in Figure 2.

The author has shown per matrix property analysis mathematically that the following inner product and outer product relationships hold, per Hilbert space to equivalent wavefunction energy functional general forms:

$\langle E|T \rangle = \langle E|U|T \rangle (\langle E \rangle \langle T \rangle)^{-1} |E \rangle \rangle^T |T \rangle U^{-1}$ . Substituting,  $E = \Psi_\mu(t)$ ;  $T = \Psi^\mu(t)$ ;  $U = V$ ;  $|E \rangle \langle T| = \rho(t)$ ;  $\langle E|T \rangle = \Psi_\mu \delta^{\Psi\mu}$ ;  $\langle (E|U|T \rangle = \Psi_\mu \delta^{\Psi\mu} \cdot F^E$ , giving result,  $F^E_t = \rho(t) (\langle \Psi_\mu(t) | \Psi^\mu(t) \rangle)^{-1} V$ .

Applying above pure mathematical results obtained by the author to quantify Coulomb Higgs gauge to deriving “string-metrics”, with diagonal terms Higgs gravity like mass factor, and cross-diagonal terms like fermionic gauge coupling given by  $\hat{G}$  would yield following:

$$\left( \left( \left( \left( \begin{pmatrix} 0 & \hat{G} \\ \hat{G}^{-1} & \hat{M} \end{pmatrix} G^{-1} \right) \hat{M} \right) G^{-1} \right) \hat{M} \right) G^{-1} \hat{M} \right) \hat{G} \quad (3)$$



Here,  $\hat{G} = (\langle \Psi_\mu(t) | \Psi^\mu(t) \rangle)^{-1} \|\nabla E_g^{\mu\nu}\| \rho(t) = f, \rho(t)$ , where  $\hat{G}$  is the functional mathematics;  $\langle \Psi_\mu(t) | \Psi^\mu(t) \rangle$  gives the inner product of the lower  $\Psi_\mu(t)$  and the upper  $\Psi^\mu(t)$  wave functions as a function of time. Gaging observables with scalar potential  $V = \|\nabla E_g^{\mu\nu}\|$ , quantum density matrix  $\rho(t)$ , and the function operator  $f$  transforming parametrically  $\rho(t)$  to  $\hat{G}$ , gets quantified by the equation:  $f = (\Psi_\mu(t) | \Psi^\mu(t) \rangle)^{-1} \|\nabla E_g^{\mu\nu}\|$ , or equivalently  $\hat{G} = f. \rho(t)$ . Also shown earlier was  $\Gamma =$  signal/noise ratio, satisfying permutation summing over point latitude  $i$  and longitude  $j$  of  $\Gamma_{ij}$ :

$$\sum_{i=1}^n \sum_{j=1}^m \Gamma_{ij} = 1 \quad (4)$$

For example, that if  $\Gamma_{ij} = [\Gamma] \{\Psi_{11} \Psi_{12} \Psi_{13} \dots \Psi_{21} \Psi_{22} \Psi_{23} \dots\}$  when summed over nodes of finite element model network circuitry assemblage values of  $i$  and  $j$ , like in Hod-PDP, i.e., the Hod-Plenum\* Pauli Dirac Planck (PDP) circuit model one can utilize Equation (4).

**Gage time gage space fields probability signal matrix:** The author has derived relationship quantifying space gauge matrix fields and the wavefunction to signal/noise measurables with:

$$\begin{pmatrix} \varepsilon_t \\ \varepsilon_x \\ \varepsilon_y \\ \varepsilon_z \end{pmatrix} (\psi_{\Gamma^+} \quad \psi_{\Gamma^\vartheta} \quad \psi_{\Gamma^+} \quad \psi_{\Gamma^-}) = \Rightarrow :: \Leftarrow = \begin{pmatrix} \Gamma_t^- & \Gamma_X^{\leftrightarrow} & \Gamma_Y^- & \Gamma_Z^{\leftrightarrow} \\ \Gamma_t^\vartheta & \Gamma_X^+ & \Gamma_Y^\vartheta & \Gamma_Z^+ \\ \Gamma_t^+ & \Gamma_X^\vartheta & \Gamma_Y^+ & \Gamma_Z^\vartheta \\ \Gamma_t^{\leftrightarrow} & \Gamma_X^- & \Gamma_Y^{\leftrightarrow} & \Gamma_Z^- \end{pmatrix} \quad (5)$$

or  $[\Gamma_{xyz}] = \Rightarrow :: \Leftarrow = [\Gamma_{x' y' z'}] [\Gamma_{x'' y'' z''}] \dots$ , with  $\{\Gamma_{x' y' z'}, \Gamma_{x'' y'' z''}\} > [\Gamma_{xyz}]$ , due to Equation (4).

Equation (5) is key to interconverting signal/noise measurements to space fields –

wavefunction eigen-spinors and then vice-versa.  $\begin{pmatrix} \varepsilon_t \\ \varepsilon_x \\ \varepsilon_y \\ \varepsilon_z \end{pmatrix}$  describes time space gauge fields of the 4D

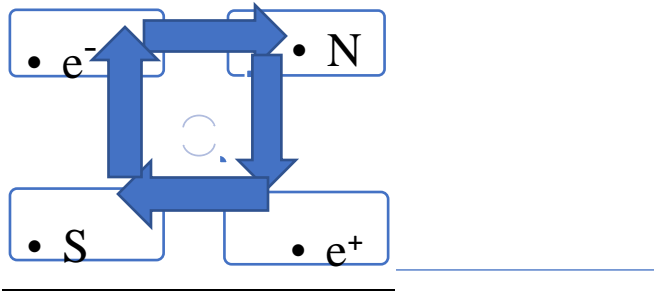
time space  $\{t, X, Y, Z\}; (\psi_{\Gamma^+} \quad \psi_{\Gamma^\vartheta} \quad \psi_{\Gamma^+} \quad \psi_{\Gamma^-})$  gives probability functions quantifying distributions of signal/noise sense  $\{\psi_{\Gamma^+}$  clockwise positive,  $\psi_{\Gamma^\vartheta}$  anticlockwise negative,  $\psi_{\Gamma^+}$  anticlockwise

positive, and  $\psi_{\Gamma^-}$  clockwise negative $\}$ .  $\begin{pmatrix} \Gamma_t^- & \Gamma_X^{\leftrightarrow} & \Gamma_Y^- & \Gamma_Z^{\leftrightarrow} \\ \Gamma_t^\vartheta & \Gamma_X^+ & \Gamma_Y^\vartheta & \Gamma_Z^+ \\ \Gamma_t^+ & \Gamma_X^\vartheta & \Gamma_Y^+ & \Gamma_Z^\vartheta \\ \Gamma_t^{\leftrightarrow} & \Gamma_X^- & \Gamma_Y^{\leftrightarrow} & \Gamma_Z^- \end{pmatrix}$  has the power to expand to a 4D

time-space point matrix signal/noise distributed over  $\Gamma$  with  $\{t, X, Y, Z\}$  {- negative, + positive,  $\vartheta$  anticlockwise,  $\leftrightarrow$  clockwise}. Each 2x2 pan-diagonal submatrices has PDP circuit cell assemblies like the molecular crystallographic observable unit cells, may be characteristics of time crystals.

**Inferring critical ( $\Gamma, \rho$ ) matrix characterizing electromagnetic gravity:** Consider condition that, if  $[\Gamma] > [\Gamma_{cr}]$ , multiple phases matrices mix, or combine; if  $[\Gamma] < [\Gamma_{cr}]$ , then phases separate onto multiple phases matrices. Mesoscopic examples may be used to demonstrate that. For example, at low  $\Gamma$  value that is typical of nebular plasmatic gases these separate onto multiple liquids-solids phases, plasma to gases, mixed gases to elemental gases of hydrogen, multiphase liquids to elemental liquids, and/or solids phases. Another example will be high  $\Gamma$  phases combining or mixing into more complex forms.

## Schematic of matrix Pauli Dirac Planck circuit



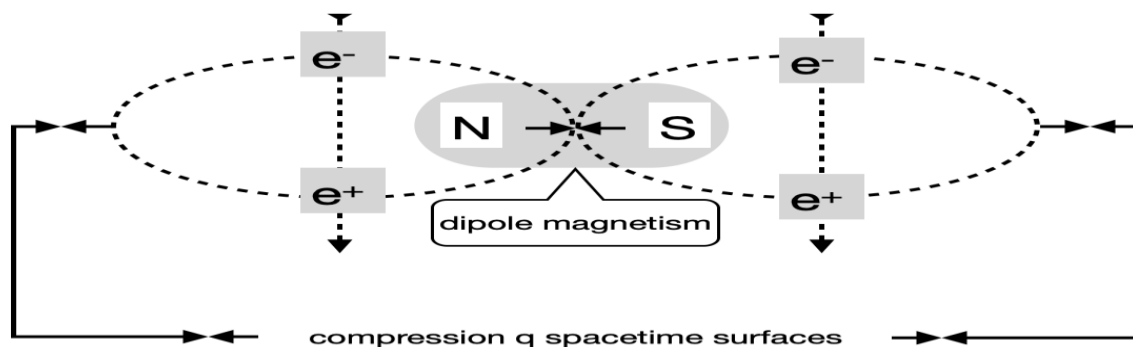
**Figure 3:** PDP model of Pauli Dirac Planck circuit assembly having  $e^-$ : electron and  $e^+$ : positron particles; N: north and S: south monopoles. Arrows show matrix gradient vortex flow.

Equation for this PDP circuit having  $\hat{\epsilon}_n = \hat{\epsilon}$  and  $\hat{\epsilon}_s = \hat{\epsilon}^*$ , can be given as the eigenvector matrix:

$$[\lambda_{\text{PauliDiracPlanckcircuitgaging}}] = [\lambda_{\text{PDPcg}}] = \begin{pmatrix} 1 & \epsilon \\ \epsilon^* & 1 \end{pmatrix} \quad (6)$$

with  $[\lambda_{\text{PauliDiracPlanckcircuitgaging}}]$ : combinatorial eigenvector bundle matrix,  $\epsilon$ : scalar value of south and north monopole field, and  $\epsilon^*$ : conjugate value of  $\epsilon$  fields. Equation (6) is characterizing like Super Symmetry (SUSY), with Hermitian quantum matrix. We envision annihilation of the electron-positron pairs as well as dipolar collapses of north and south monopoles “stable” magnetism, representing quantitatively in “Stringmetrics” gage Equation (3), characterizing electromagnetic fields here. Per John Hodge’s results showing forces of south poles to be slightly stronger than that of the north poles, we expect  $\hat{\epsilon}_s > \hat{\epsilon}_n$  slightly. Considering that,  $[\lambda_{\text{PDPcg}}]$  will be asymmetric strings gage metrics, a non-Hermitian quantum matrix, pointing to anisotropic eccentric precession of electromagnetic gaging fields, like electromagnetic gravity.

## Graphical Scenarios Analysis with PDP Circuit Assembly



**Figure 4:** Schematic showing how PDP configuration may account for dipole magnetism generated due to dynamic electric tensors created out of monopole magnetic gaging fields. Space-time surfaces result from compressed quanta action interactions.

The author has explained earlier in many publications that Figure 4 above will provide the best scenario for a finite element modeling analysis with computer programming validating theory of PDP mechanism simulations. Poynting vector maybe utilized to measure electric and magnetic effect fields at each point. The Poynting vector is a quantity that describes how much energy is carried by an electromagnetic wave, such as light or radio waves. The Poynting vector is calculated by taking the cross product of the electric field and the magnetic field of the wave, divided by the permeability of the medium that the wave travels through. The direction of the Poynting vector is the same as the direction of the wave propagation, and its magnitude is proportional to the intensity of the wave. The unit of the Poynting vector is watt per square meter, which means power per unit area, formula  $S = (E \times B) / \mu_0$  can be used to calculate Poynting vector at any point in space appropriate to measure point-to-point signal/noise matrix.

**Numerical results theoretical with Hod-PDP mechanism having Table of earlier graphs**

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**Zero-point gradient energy,  $E_g \approx 10^{26}$  metric unit energy value order of magnitude**

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<b>Monopole mass <math>M_m</math> (kg)</b>	<b><math>10^{-47}</math></b>	<b><math>10^{-11}</math></b>
<b>Entity sizes out of zero-point microblackhole (m)</b>	<b><math>10^{-8}</math></b>	<b><math>10^{-26}</math></b>
<b>Estimated space-time extent</b>	<b><math>10^{28}</math></b>	<b><math>10^{-8}</math></b>
<b>Monopole core size (m)</b>		<b><math>10^{-30}</math></b>
<b>Charge of a monopole</b>		<b><math>1/2e</math></b>
<b>Fermion size (m)</b>		<b><math>10^{-18}</math> to <math>10^{-15}</math></b>
<b>Estimated size of PDP monopole particle circuit assembly (m)</b>		<b><math>&lt;10^{-26}</math></b>

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**Table 1:** Summary with theoretical numerical results of Hod-PDP mechanism; shown are monopole mass, zero-point micro-blackhole entity sizes, estimated space-time extent, monopole core size, monopole charge, size of a fermion typically, and estimated size of Pauli-Dirac-Planck circuit monopole particle assembly. The estimated size of Pauli Dirac Planck circuitry assembly is greater than  $10^{-34}$  Planck magnitude and less than quasi-particle size  $10^{-26}$  metrics unit.

**Observable quantum physics discontinuity computing**

The author has shown applying Equation (3) of “stringmetrics” by letting  $\tau_{energy} \Psi_{fields} = V \rho(t)$ , reasoned out in earlier publications to arrive to Physics conjecture of “ $\tau_{energy} \Psi_{fields}$ ” providing observable. Simple proof analog  $\rho(t) = \text{energy quantum density form of charge}$ , where  $i$  defined as current density, we get result  $V \rho(t) = V i = \text{power density, } \delta P$ , This enables author to deduce  $\tau_{energy}$  to be equivalent to  $\delta P$ . Since energy =  $\hbar(\tau)^{-1}$ , time differential change in the geometry/topology are inferable by setting  $\{(\delta P)(\text{geometry})\}$  to be in the form of electrical energy observable in terms of mechanical motor action or photon light action; then, geometry

will refer to {area, volume} multiplicative factor to transform power density to energy form. Since mechanical motor action or photon light action are physically observable, the author can prove “ $\tau_{energy} \Psi_{fields}$ ” to be observable parameter. Lemma of this author further interprets observable Physics “ $\tau_{energy} \Psi_{fields}$ ” as also representing “discontinuum line” mathematically. Analog of potential is velocity,  $v$ , and that of a wavefunction is trajectory,  $r(t)$ . The author has shown that equation of gage transform is:

$$g[r_{DEF}(t)] = g[n(t) \cdot DL] + g[r_g(t)] = g[n(t)] \cdot g[DL] + g[r_g(t)] = g[r_g(t)] \quad (7)$$

where  $g$  = gage differential,  $r_{DEF}(t)$  = discontinuum energy field spatial length in time,  $t$ ,  $n(t)$  = number discontinuum lengths with time,  $t$ ,  $DL$  = discontinuum length,  $g[DL] = 0$  having  $DL =$  constant,  $r_g(t)$  = gap length of discontinuum length  $DL$  as a function of time. One may envision characterizing discontinuum length  $DL$  and the gap length  $r_g(t)$  by binary matrix since these variables logically are discrete parameters.  $r_g(t)$  is thus quantized codable as  $1 \dots 0 \dots 1 \dots 1 \dots 0 \dots 1$ , eventually enabling to discretize time space sense.

### Macroscopic simple examples of applied problem-solving physics normal observables

The author has already demonstrated earlier with the following situational PHYSICS, with:

$$\begin{pmatrix} [Gg] \Gamma_{ij}^l \\ [Gg] \Gamma_{ij}^\xi \end{pmatrix} \begin{pmatrix} \hat{\epsilon}_{GR,v} & \hat{\epsilon}_{GR}^g \\ \hat{\epsilon}_{GR,g} & \hat{\epsilon}_{GR}^v \end{pmatrix}^{-1} (\Psi d1 \ \Psi d2) \begin{pmatrix} \Psi s1 \\ \Psi s2 \end{pmatrix} \begin{pmatrix} \hat{\epsilon}_{GR,v} & \hat{\epsilon}_{GR}^g \\ \hat{\epsilon}_{GR,g} & \hat{\epsilon}_{GR}^v \end{pmatrix} = \begin{pmatrix} \Gamma_{ij}^{d1} & \Gamma_{ij}^{s2} \\ \Gamma_{ij}^{s1} & \Gamma_{ij}^{d2} \end{pmatrix} \begin{pmatrix} \hat{\epsilon}_{GR,v} & \hat{\epsilon}_{GR}^g \\ \hat{\epsilon}_{GR,g} & \hat{\epsilon}_{GR}^v \end{pmatrix} \quad (8)$$

where in a lake population pattern of swimming ducks and swans exist, having ducks moving in a row,  $\Psi_\mu = \Psi_d = \Psi_{ducks}$ ,  $\Psi^\mu = \Psi^s = \Psi^{swans}$ , (which are probability functions quantifying population pattern with swans/ducks, observations showing swans move in swimming direction, however, ducks oriented at different directions),  $\rho_{ds}$  = density pattern of populated ducks and swans,  $[G_g]_{\Gamma_{ij}}$ : the functional,  $G_g$  having  $\Gamma_{ij}$ , signal/noise ratio of sound ( $\Gamma_{ij}^\xi$ ), light ( $\Gamma_{ij}^l$ ), as well as modon strings  $\{[d]=>::<=[s]\}$  of  $G_g$  modulating swans/ducks movements,  $\epsilon_{GR} = (\epsilon_{GR})_{gv} =$  gauge fields corresponding to equivalent mechanics:  $[g, v]\{\text{gradient, vortex}\}$  with up and down pressure as well as temperature. Thereby, gradient = temperature, pressure = vortex fields, hence observables can be algorithmized as expansion matrix:  $\langle \Psi_{ducks}(tg) | = (\Psi d1 \ \Psi d2)$  “ducks on a row”;  $|\Psi_{swans}(tg)\rangle = \begin{pmatrix} \Psi s1 \\ \Psi s2 \end{pmatrix}$  “swans on arrow”. The gradient fields are up/down temperature, and the vortex fields are anticlockwise-clockwise pressure. Configurations therefore will be:  $[G_g]_{\Gamma_{ij}} [(\epsilon_{GR})_{gv}]^{-1} \langle [\Psi_d(t_g)] | [\Psi^s(t_g)] \rangle [(\epsilon_{GR})_{gv}] = [\rho_{ds}(t_g)] * [(\epsilon_{GR})_{gv}]$ . Application of Equations (4) and (5) give these results. Permutating process population pattern sequel will help to generate simulation algorithmic equation of the moving population greater than  $[2 \times 2]$  matrix of the above-mentioned example.

**Intensity matrix versus density matrix four-vector formalism physics:** The author has shown

applying Equation (5) with gauge fields  $[\mathcal{E}] \equiv \{0, \text{off}, \text{on}\}$  to be numerical matrix:  $\begin{pmatrix} 0 \\ \emptyset \\ 1 \\ \phi \end{pmatrix}$ , calibrated

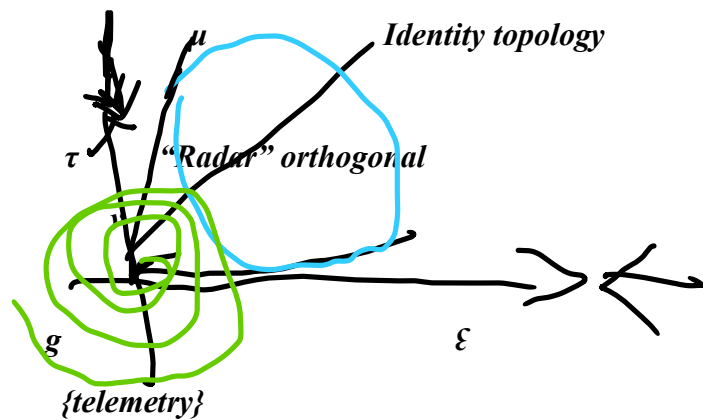
as standardized physics procedures; here, “0” = zero fields, “ $\emptyset$ ” = neither off nor on fields, “1” = on fields; “ $\phi$ ” = both off and on fields, which would be true in the quantum entangled fields. “ $\emptyset$ ” = neither off nor on fields are equivalent intermittent nonzero field, switching or flickering

observable signals. “ $\phi$ ” = both off and on fields would be quantifying quaternionic, turbulent, excessive, or entangled conditional form, encountered for example in explosive situations. Equation (5) transforms to the following.

$$(\cdot \Gamma_{\omega,gr} \cdot) \Rightarrow: \leq = \begin{pmatrix} 0 \\ \emptyset \\ 1 \\ \phi \end{pmatrix} (\psi_c, \psi_\Delta, \psi_+ \psi_-) \text{ specific case with } \phi \equiv i. \quad (9)$$

Algorithm Equation (9) is a four-vector matrix form 4x4 quaternion matrix physical mathematics. This has power to quantify electromagnetic gravity applying Equation (5) to 4x4 quaternion wavefunction gaging field physics with micro-macro space, charge, complex, astrophysical, quantum electromagnetic gravity fields entangled, decohered, neither or both wavefunction quaternion forms. These are quite useful to advance towards group theory fields groups to Particle PHYSICS Standard Model classifications. Hence, overall observable parameters that are observationally measurable physics with “G” = functional “Stringmetrics” field factor, “M” = “Stringmetrics” mass factor, “T” = Hod-PDP signal/noise factor, “ $\rho$ ” = density factor, giving fields-masses, {“G”, “M”} = matrices affected by “ $\rho$ ”, and “T” = matrix affected by wavefunctions + gauges fields. We note that:  $\rho = |\psi\rangle\langle\psi|$ .

The author has proposed Quantization of time feasible PHYSICS with Corrado Massa’s minimal power determinations of  $10^{59}$  ergs/sec giving quantum\_time  $\sim 1/(10^{59} \cdot 10^{-7}) \sim 10^{-52}$  secs. The author has Table 1 interpretation of quantum monopole to exist below  $10^{-52}$  seconds, further between  $10^{-52}$  seconds and  $10^{-34}$  seconds (Planck\_time), entities may be existing as W.I.M.P. dark matter. Above  $10^{-34}$  seconds, entities are likely to exist as quasi-particles like Hod-PDP assembly



Mainly there are five fields per Aleksey Zakharenko’s PHYSICS that will include two exotic fields with **magnetic, electric, elastic, gravitational, and torsional fields**, possessing five types of universal/local symmetries & waveforms. (1) **Perfect symmetry matrix** (2) **Time reversal symmetry** (3) **Magic square symmetry matrix** (4) **Prime factored symmetry** (5) **II symmetry matrix**. The author has graphed schematically with algorithm gage PHYSICS:  $x=\mu$ (magnetic),  $y=v$ (electric),  $X=\xi$ (elastic),  $Y=\tau$ (torsional),  $g=g_{nr}=g$ (gravitational) to representing gage algebra:  $(x, y)_Y^X$  to give:  $(\mu, v)_\tau^\xi |_{\theta\phi} g$ , with proposition: Zeroth dimension  $\equiv$  absolute vacuum, and 1 to 5 dimensions exhibiting zitterbewegung to alpha information waves!!

Retrofitting wavefunction, gage field phase-angle information onto reconstruction of algebra generalized mediating environment interacting entity per Feynman diagram quanta flowchart:



**Figure 5:** states that if  $X = \mathbf{q}_n$ , the monopole  $N$  quantum charge,  $Y = \mathbf{q}_s$ , the monopole  $S$  quantum charge,  $\mathcal{E} = \mathbf{Q}\epsilon$ , the  $\mathbf{Q}$  factor of dipole environment  $\mathcal{E}$ , then  $X' = \mathbf{q}_g$ ,  $Y' = \mathbf{q}_l$ . They are a function of wavefunction, gauge field, timeline versus worldline, temperature (heat), and point potential (all four field) aspects. Experimentally, profile density, potential, temperature, signal/noise, elapsing time, wavefunctions, and mode of switches could be sensed, measured, and analyzed having observations on the point-to-point basis.

### Quantum Gravity Modified Newtonian Dynamics PHYSICS Discontinuum Modeling

The author has derived formalism quantum gravity PHYSICS, starting with gravitational Galilean Newtonian equation. Force ( $F_{qg}$ ) is  $Gm_1m_2/r^2$ , gaged to quantum in the following way:  $\mathbf{F}_{qg} = (\mathbf{G}_{qg})^{-1} (\mathbf{r}_{qg}^4) (\mathbf{g}[\mathbf{r}_{qg}])^{-1} (\mathbf{H}_n')^2 (\mathbf{g}[\mathbf{g}[\mathbf{r}_{qg}]]) (\mathbf{g}[\mathbf{f}^{**}(\mathbf{H}_n)])$ , where symbols  $\mathbf{G}_{qg}$ : universal gravitational constant ( $G$ ) gaged to quantum discontinuum;  $\mathbf{r}_{qg}$ : discontinuum energy fields (DEF) spatial length related to discontinuum length (DL) as a function of time ( $t$ ); thereby, we have  $\mathbf{g}[\mathbf{r}_{qg}] =$  gage of  $\mathbf{r}_{qg}$ , which is the gage discontinuum quantum velocity corresponding to DEF.  $(\mathbf{r}_{qg}^4)$  will represent topology, like toroidal or rotated mobius strip manifold spatial geometry.  $(\mathbf{g}[\mathbf{g}[\mathbf{r}_{qg}]])$  will represent gage of gage of  $\mathbf{r}_{qg}$ , which is gage of discontinuum quantum velocity or gage acceleration like in gravity.  $\mathbf{H}_n$  represents Hamiltonian, corresponds eventually to Iyer Markoulakis Model Formalism.  $\mathbf{H}_n'$  corresponds to differential energy Hamiltonian.  $\mathbf{g}[\mathbf{f}^{**}(\mathbf{H}_n)]$  corresponds to gage of Legendre transform of the (Lagrangian) Hamiltonian DEF. **Point Laplacian Gradient Microblackhole PHYSICS** has been treated to above equation having time evolution Hamiltonian defining microblackhole vortex action to get Laplacian gage solution with  $H = \{i\hbar/(t_f-t_i)\}[\ln |\mathcal{L}p(t)|]$ . Substituting this value of Hamiltonian in the above Equation with  $\mathbf{H}_n = H = \{i\hbar/(t_f-t_i)\}[\ln |\mathcal{L}p(t)|]$ , and differential Hamiltonian  $\mathbf{H}_n' = \partial H/\partial t = (\partial/\partial t)(\{i\hbar/(t_f-t_i)\}[\ln |\mathcal{L}p(t)|]) = \{i\hbar/(t_f-t_i)\}\{\mathcal{L}'p(t)/\mathcal{L}p(t)\}$ , with differential Laplacian  $\mathcal{L}'p(t)$  has to get computed per physics. Hence, algorithmic equation microblackhole gage gravity force ( $F_{qg}$ ) transforms to:

$$\mathbf{F}_{qg} = -i\hbar^3(\mathbf{G}_{qg}(t_f-t_i)^3)^{-1} (\mathbf{r}_{qg}^4) (\mathbf{g}[\mathbf{r}_{qg}])^{-1} \{\mathcal{L}'p(t)/\mathcal{L}p(t)\}^2 (\mathbf{g}[\mathbf{g}[\mathbf{r}_{qg}]]) (\mathbf{g}[\mathbf{f}^{**}(\ln |\mathcal{L}p(t)|)]) \quad (10)$$

Invoking Operator Algebras, functions, functors, transforms and detailed mathematical physics treatment with more than 20 pages of derivational process, the author has expressed the Equation (10) with only time, space-field, and rotational parameters quantifying essence of the quantum gravity PHYSICS!! With inverse Fourier transform from the time domain to the rotational (frequency,  $\nu$ ) domain, noting the time,  $t \equiv \mathcal{F}^{-1}(\omega)$ , and hence,  $t_g \equiv \mathcal{F}_g^{-1}(\omega)$ , the inverse Fourier transform of angular velocity or speed,  $\omega = 2\pi\nu$ , taking into account Hod-PDP mechanism to have triaxial rotational orthogonal contributions like  $[(\mathbf{O})]_{\text{effective}} \Rightarrow \therefore \Leftarrow = \{\theta_{\text{spin}}, \eta_{\text{rotation}}, K_{\text{revolution}}\}$ , which are the angle of spin, angle of rotation, and angle of revolution of Hod-



*PDP quantum assembly explained per published algorithm model ICMHZZ magneto-electric Schematic within the Figure 4 explaining Hod-PDP assembly of the rotational fields. Mathematical transforms operational manipulations performed completely with simplifying computing is given in the resulting algorithm equation having graphical metrics,  $[Y] = g_g[X]$ , where output matrix  $[Y]$  is a metrically adjusted function of input metrical matrix  $[X]$  such that  $g_g$  is a gage fibrational string parameter. Typically,  $g_g = 1$  to get a resultant Algorithm Graphical Equation with scalar quantum gauge field  $||[\mathcal{E}_{GR}]||$  in terms of general transforms with Laplacian, Fourier, and the Legendre gaging the spin, rotation, revolution, and  $\Omega_{qg}$  as a function of time. Hence, these are theoretical to experimental observable measurable parameters purely in terms of algebra transforms. Universal constants, which may not be constants over a long time of observations have been essentially eliminated by this thorough mathematical transformation process of the operator algebra.*

## **Algorithm numeration matrix simulation programmable**

*Equation (10) with above explained methods, the author transformed quite in general to time tensor gauge field rotation, spin, and revolutions only as a function of space-fields-time.*

$$\begin{aligned}
 [X] &= \{(\mathcal{L}'\mathbf{p}(\mathcal{F}^{-1}(g\{\cos\theta_{spin}(t), \sin\theta_{spin}(t)\}, \eta_{rotation}(t), \kappa_{revolution}(t))))^2 \\
 &(\mathcal{L}\mathbf{p}(\mathcal{F}^{-1}(g\{\cos\theta_{spin}(t), \sin\theta_{spin}(t)\}, \eta_{rotation}(t), \kappa_{revolution}(t))))^{-2} \\
 &(g [f^{*'}(\ln |\mathcal{L}\mathbf{p}(\mathcal{F}^{-1}(g\{\cos\theta_{spin}(t), \sin\theta_{spin}(t)\}, \eta_{rotation}(t), \kappa_{revolution}(t))))])^{-1} \cdot \omega_{qg}(t) \\
 [Y] &= ||[\mathcal{E}_{GR}]|| \tag{11}
 \end{aligned}$$

*where  $\mathcal{L}\mathbf{p}$ : Laplacian;  $g[f^{*'}(f'(p^2))] \equiv$  gage of Legendre transforms of Lagrangian energy term  $p^2/m$  having  $p$ : momentum, and  $m$ : mass has been taken care of with transform manipulations.*

*$\mathcal{L}\mathbf{p}(\mathcal{F}^{-1}(g\{\cos\theta_{spin}(t), \sin\theta_{spin}(t)\}, \eta_{rotation}(t), \kappa_{revolution}(t)))$ : Legendre transforms of inverse Fourier gage angular {spin, rotation, revolution} which are functions of time.*

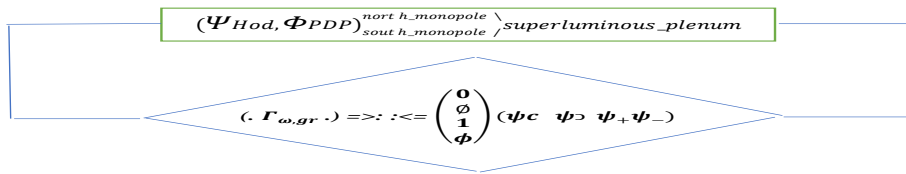
*$\mathcal{L}'\mathbf{p}(\mathcal{F}^{-1}(g\{\cos\theta_{spin}(t), \sin\theta_{spin}(t)\}, \eta_{rotation}(t), \kappa_{revolution}(t)))$ : Jacobian, 1<sup>st</sup> derivative of Legendre transforms of inverse Fourier gage angular {spin, rotation, revolution} that are functions of time.*

*$\omega_{qg}(t)$ : quantum gravity angular velocity as a function of time.*

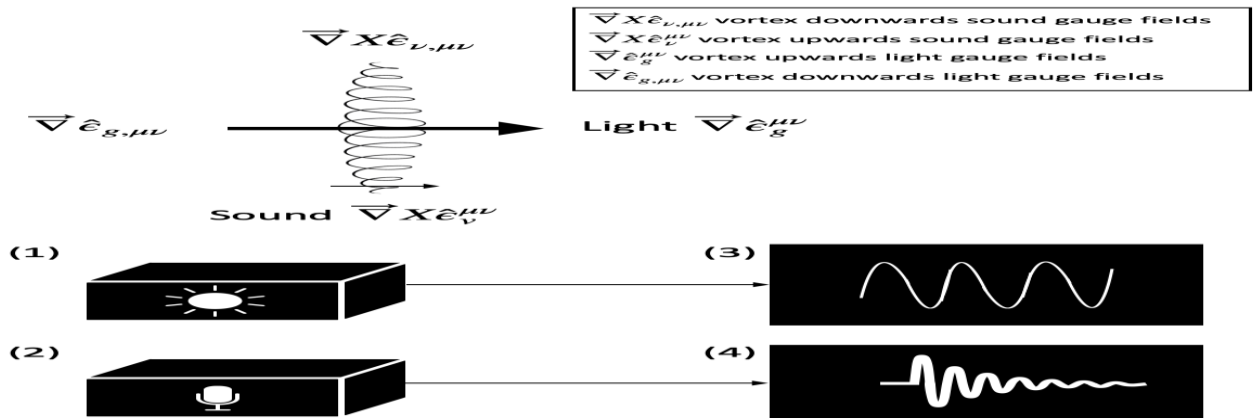
*$||[\mathcal{E}_{GR}]||$ : scalar space quantum gauge field matrix protocol, measurable normalized parameter.*

### **Prototype set-ups, figures, variable measuring instrumentation systems Experimental Designs**

*The flowchart given in Figure 6 tells us about wavefunction-potential within Superluminous Plenum having north, and south monopoles<sup>44</sup> or normally dipoles like Hod-PDP will give signal/noise matrix output that is quantum parametrically forked to switching gauge fields and then separately as wavefunctions characteristics: {spin, rotation, revolution} matrix particles that are hypothesized to generate out of universal Superluminous-Plenum quagmire.*



**Figure 6:** General measurement procedure theoretical to experimental with Algorithm Equations (5) and (9) with explanations giving parametric measurement grid flowchart schematically.



(1) Point-to-point astrophysical light intensity signal/noise and spectra density matrices measurement sensor microprocessor like diamond chips embedded operational device. (2) Sound acoustic-electric transducer profile switches signal pattern density matrices measurement sensor microprocessor like piezoelectric operational device embedment. (3) Photometer sensor point-to-point profiling switches [mode] {0, off, on} oscilloscope density matrices signal/noise pattern measurement calibration enhanced systems. (4) Sound-meter spectroscopic signal/noise pattern measurement oscilloscope attachment density matrices signal/noise pattern measurement calibration enhanced systems. Per the above explanation, Poynting vector can be used to measure the electric and magnetic fields of the light at a given point; formula  $S = (E \times B) / \mu_0$  calculates Poynting vector of a point in space.

**Figure 7:** Schematics of an intensity profile signal/noise matrix measurement instrumentation system with point-to-point precision accurate integrated circuit diamond chips microprocessors. Observable measurable astrophysical signal/noise matrix of sound and light detected by sensors decoded by component elements linked to oscilloscope spectroscope and sound meter to gauge fields and the quantum wavefunctions quantified Algorithm Equations (5) and (9).

**Figure 7** provides a viable means of capturing observable measurable astrophysical signal/noise matrix of sound and light. These parametric scalar gauge fields are then sent appropriately to sensors linked to oscilloscope spectroscope sound meter instrumented measurement systems. Sensors are essentially fabricated devices having point-to-point precision accurate integrated circuit diamond chips microprocessors. They are thus equipped to detect point-to-point astrophysical light intensity signal/noise and spectra density matrices of light signals. Photometer sensor point-to-point profiling switches [mode] {0, off, on} measure signal/noise pattern density matrices with calibration enhanced systems. Sound signals are separately captured, sent to detectors, and analyzed by using acoustic-electric transducer profile switches to measure signal pattern density matrices.



## **Fibrational Bundle Gage Transforms PHYSICS Systems**

Algorithmic Graph Equation (11) in fibrational graphic form of  $[Y] = g_{fts} [X]$  can be substituted to gage specific parameters as  $[[[\mathbf{E}_{GR}]]] = g_{fts} f(\text{grouping\_transforms}(\text{time}))$ . Mathematically inverse operation of this equation gives algorithm: **grouping\_transforms (time) =  $f^{-1}([[[\mathbf{E}_{GR}]]]/g_{fts})$** . Time is mathematically inverse transform, giving four-vector time matrix:

$$\| \begin{pmatrix} \hat{t}_{pr,\mu\nu} & \hat{t}_g^{\mu\nu} \\ \hat{t}_{l,\mu\nu} & \hat{t}_r^{\mu\nu} \end{pmatrix} \| = g^{-1}[f^{-1}([[[\mathbf{E}_{GR}]]]/g_{fts})] = g_{fts} [\text{transforms}] \quad (12)$$

where with  $\hat{t}_{pr,\mu\nu}$ : proper time,  $\hat{t}_r^{\mu\nu}$ : real time,  $\hat{t}_g^{\mu\nu}$ : global time, and  $\hat{t}_{l,\mu\nu}$ : locally time;  $[[[\mathbf{E}_{GR}]]]$ : scalar space gauge matrix fields gaging to normalized four-vector time matrix.

### **Quantifications, Measurements, and Discontinuum gravity bundle transform PHYSICS**

The author has derived the following equation based on peer published articles Discontinuum PHYSICS that Taylor and Iyer have generalized embodied-energy-discontinuum (EED) field and a disembodied-energy-discontinuum (DED) field are part of each other. **Gist of what it will apply to quantify discontinuum PHYSICS** with a simpler way, the formalisms, referring to results of Equations (11) and (12) lead to algorithmic equation expressing:

$$(DEF) = (\text{gravity\_bundle\_transform}) (\text{weight}) = \Sigma\{(\text{fiber\_transforms}) * (\text{gage\_velocity})\} \quad (13)$$

having  $DEF = \text{spatial differential of gravitational force} = \partial/\partial r(GmM/r^2)$  and  $M/r^2 = \rho r^3/r^2$  such that  $\rho = \text{gravity density matrix}$  is equivalent to concentrated huge gravitational mass,  $M$  which is having its gravitational influence spreading over  $\mathbf{r}$ , the spatial distance between  $m$  and  $M$ . Equation (13) summarizes with a gist of DisContinuum PHYSICS (DCP), allowing evaluation of the Discontinuum\_Energy\_Field (DEF) by having computation of algorithm using typically algebraically general mathematics:  $[Y] = f_T [X]$ ;  $f_T \equiv \text{fiber\_transform}$ , having gage\_time with gage\_fields of light and sound that can be connected to Taylor and Iyer TOR predictions with the discontinuum physics so that gage\_velocity will correlate with discontinuum object equation of motion. Experimental observations with measurements of gage\_velocity and the weight relationships to get Equation (13) that has theoretical capability to facilitate an experimental design by having circuit analog.  $[Y]$  and  $[X]$  have parametric adjustments to estimate (DEF), Algorithm Equation (13) tells us that determination of the (gravity\_bundle\_transform) is possible by having programmatic computation of general equation of the algorithm  $[\Sigma\{(\text{fiber\_transforms}) * (\text{gage\_velocity})\}]/(\text{weight})$ . Discontinuum physics gage unifies paradigm shifting PHYSICS.

### **IT of algorithm Quantum Computing PHYSICS coding matrix**

The author has simplified Equation (9) into compact algorithm IT coded to represent states of time switching quaternion patterns with states of switch off = 0, on = 1, not\_off =  $\theta$ , not\_on =  $\perp$  (note: **not\_off  $\neq$  on and not\_off  $\neq$  off** in general) operated by "ketvector" [on off] to generate global and local quantum parameters,  $q_g$  and  $q_l$  is given by  $\begin{pmatrix} 0 & 1 \\ \perp & \theta \end{pmatrix} \begin{pmatrix} on \\ off \end{pmatrix} = \begin{pmatrix} q_g \\ q_l \end{pmatrix}$  evaluating with Pauli matrices equivalently with quaternion spinor to get:

$$\begin{pmatrix} 0 & 1 \\ \perp & \theta \end{pmatrix} \begin{pmatrix} on \\ off \end{pmatrix} = \begin{pmatrix} 0 & -i \\ i & \theta \end{pmatrix} \begin{pmatrix} on \\ off \end{pmatrix} \quad (14)$$

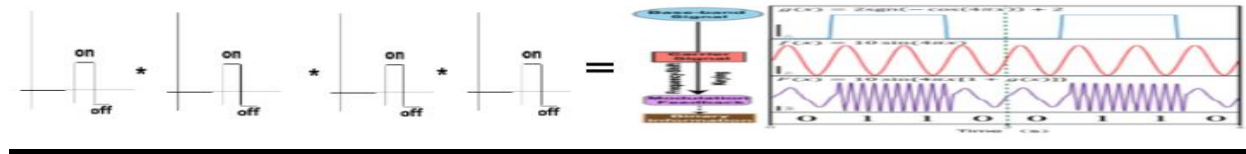
The author then carried out further analytical mathematics to find the relationship of switching states and off and on modes. Evaluating Equation (14):

$0*on + 1*off + \mathbf{1}*on + \theta*off = -i*off + i*on$ . Hence,  $-i*off + i*on = \mathbf{1}*on + \theta*off$ . Inputting values  $\theta \equiv off-on$  &  $\mathbf{1} \equiv on-off$ , we get:  $-i*off + i*on = on-off * on + off-on * off$ . On simplifying the author gets resultant:  $(i - on-off) * on = (i + off-on + 1) * off$ . So, off in terms of on mode.

$$i.e., Off = \frac{(i - on-off)}{(i + off-on + 1)} * on \quad (15)$$

which has a nonzero denominator; an inference will be if off is nonzero, noisy it is like nebulae!! We can have condition:  $off = 0$  if  $i = on-off$ , or  $(on-off)^2 = -1$ , translating to quaternions equation  $(on-off)^4 = 1$ . It will then be analogous to switches mode multiplier, that appears like

**“Quaternion switches modulating equivalent synthesis waveforms”**. This can be graphically shown having a square wave that is on-off multiplying over to generate photomultiplier like effect. There are pattern binary coding sequences that are eventually computer simulation programming to show switching signal/noise effects. We can apply Equation (15) to transform Equation (14) into numerical values with binary coding 0 and 1 matrix forms. However, it is to be noted Algorithm IT Quaternions PHYSICS Matrix:  $\begin{pmatrix} 0 & 1 \\ \mathbf{1} & \theta \end{pmatrix} \begin{pmatrix} on \\ off \end{pmatrix} = \begin{pmatrix} q_g \\ q_l \end{pmatrix}$  has non-integer values with  $\theta$  and  $\mathbf{1}$ . In the following, the author has derived equivalent numerical matrix by recognizing the natural processes of the prime number factorizations. Hence,  $\theta = pf0$  and  $\mathbf{1} = pf1$  in notation symbols to programming.



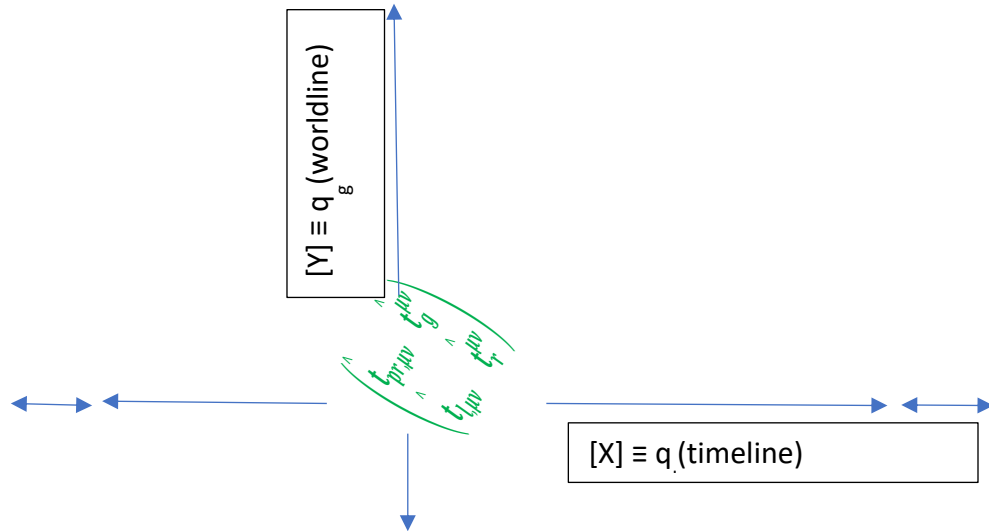
**Figure 8:** Quaternion on-off switches modulating square waves effect like photomultipliers lasering!! Mesoscopic observable twinkling stars sky!! [Reference: image Wikipedia output].

## **PHYSICS results matrix value coding**

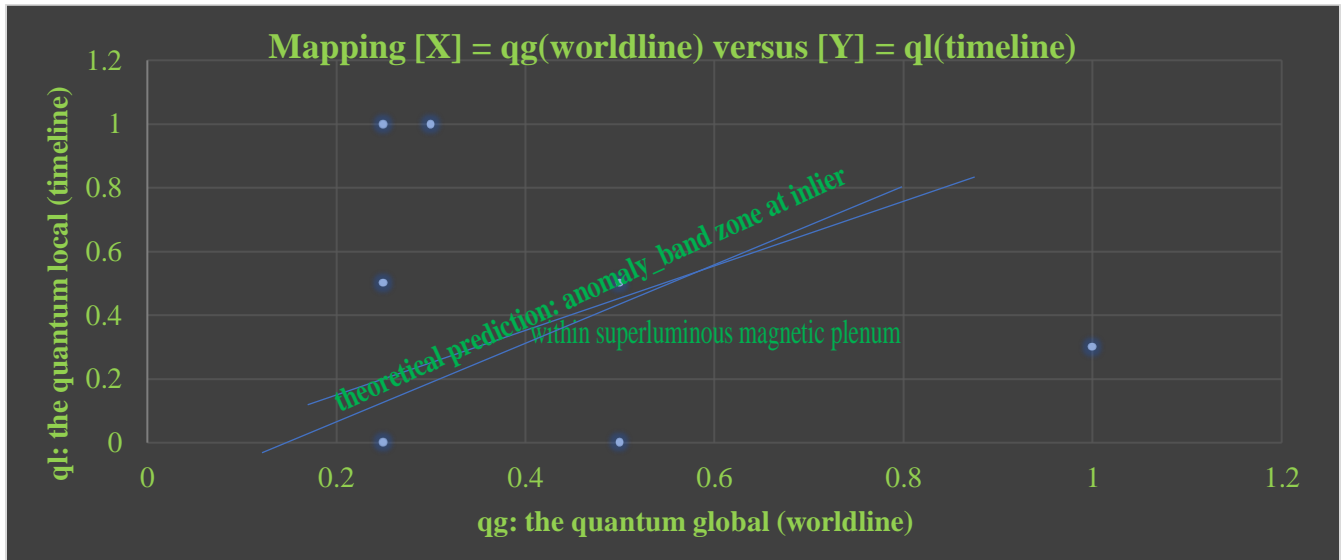
$\begin{pmatrix} 0 & 1 \\ \mathbf{1} & \theta \end{pmatrix} \begin{pmatrix} on \\ off \end{pmatrix} = \begin{pmatrix} q_g \\ q_l \end{pmatrix}$  the logic Algorithm IT Quaternions PHYSICS Matrix will become:

$$\begin{pmatrix} 0 & 1 \\ pf1 & pf0 \end{pmatrix} \begin{pmatrix} 1 \\ 0 \end{pmatrix} = \begin{pmatrix} q_g \\ q_l \end{pmatrix} \quad (16)$$

Equation (16) has parameters  $pf1$  (permutating) as taking up values of  $(1/prime\_number)$ ; thereby,  $pf0$  (permutating) taking up conjugatively values  $(-1/prime\_number)$ ; we know already,  $[prime\_number]$  set takes values of  $\{1, 2, 3, 5, 7, \dots\}$  input to syntactically machine coding computer program. Graphically then plotting  $[X]$  axis =  $q_g$ : the quantum global as well as then the  $[Y]$  axis =  $q_l$ : the quantum local parametric values will output PHYSICS characterizing properties!! Typical examples with arithmetic numeration matrix calculations are given in many of the author's peer publications with computer programming simulation graphing has generated results that are also demonstrated by this Chapter.



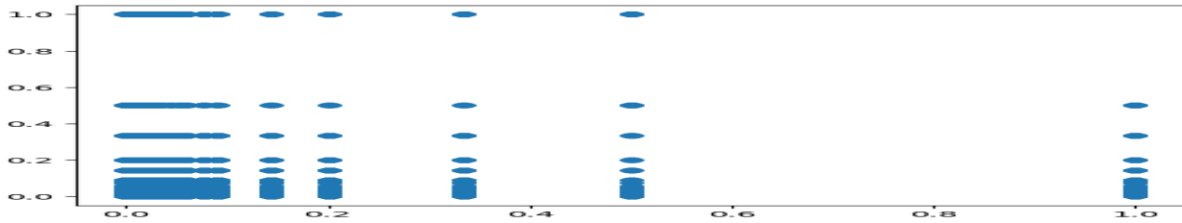
**Figure 9:** tensor time four-vector matrix rotated to correspond to graphing quantum parameters variables with  $[X] \equiv \mathbf{q}_l(\text{timeline})$  and  $[Y] \equiv \mathbf{q}_g(\text{worldline})$  axes Equations (11) through (16). Graphing the global quantum,  $\mathbf{q}_g$ , versus the local quantum,  $\mathbf{q}_l$ , by rotation matrix to suit  $[X]$ - $[Y]$ , which are interchangeable, plotting corresponding to tensor time four-vector matrix format in this figure.



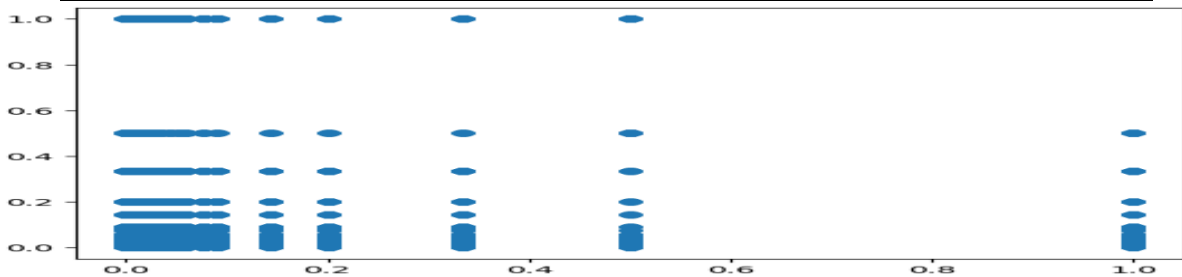
**Figure 10:** schematically shows mapping  $[X] = \mathbf{q}_g(\text{worldline})$  versus  $[Y] = \mathbf{q}_l(\text{timeline})$ . where  $[X]$  and  $[Y]$  are adjusted to PHYSICS operator matrix protocol, plotting quantum probability values manifesting Equations (15) and (16), within Superluminous Magnetic Plenum.

Here, briefly these preliminary theoretical results are enumerated executing program to compute  $\mathbf{q}_g$  and  $\mathbf{q}_l$  for  $pf0$  and  $pf1$  prime numbers up to 10,000 in one case and 100,00 in the other. **Figure 11** shows results.

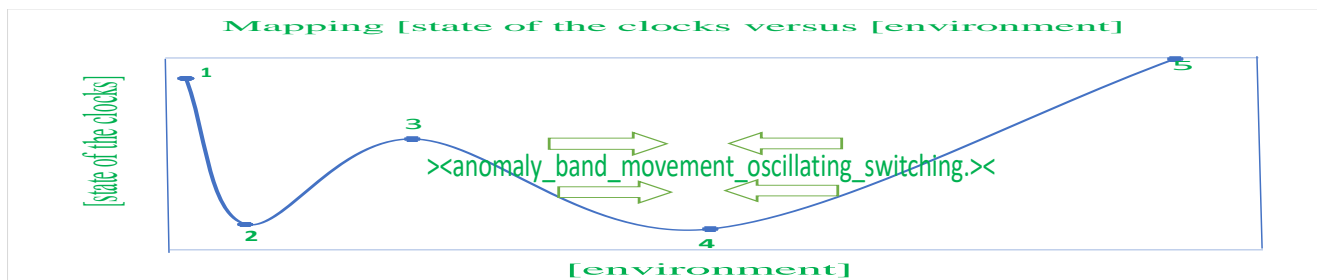
## Results for 10,000 prime number factorisations\* (M1)



## Results for 100,000 prime number factorisations\* (M2)



**^Origin (0, 0) zero time point ^(vacuum?!) intersection nodes of timeline weaving worldline!!**  
**Figure 11:** outputs graphing to plot computer programmed algorithm Equation (8) to map  $q_l$  and  $q_g$  for  $pf_0$  and  $pf_1$  prime numbers up to 10,000 in one case (m1) and 100,00 in the other (M2). \*Mathematics constraint with\*  $pf_1$  (permutating) =  $1/\text{prime\_number}$ ;  $pf_0$  (permutating) =  $-1/\text{prime\_number}$ ; [X] axis =  $q_l$ : the quantum local; [Y] axis =  $q_g$ : the quantum global parametrizing variables. Courtesy: Christopher O'Neill, IT Physicist of Cataphysics Group, Ireland coding\* executed computer simulation programming.

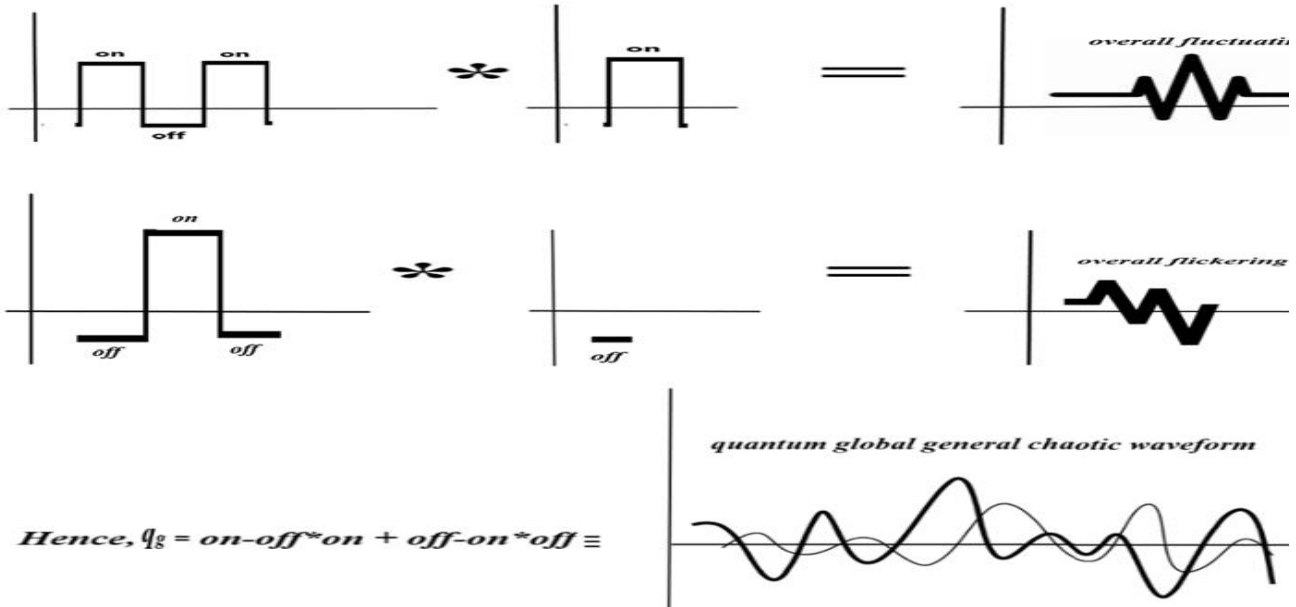


**\*Legends\* [environment]: 1. wormhole inertia; 2. event horizon maximizing inertia; 3. subluminal; 4. vacuum; 5. Superluminal.**

**[state of the clocks]:** absolute quantum relativistic speeds within light (vacuum) slowing due to inertia (1->2); then minimum at event horizon (2), running faster with subluminal (3), frozen at vacuum light speed (4), time clocks going higher than speed of light getting negative time runs (5), similar events happening (2->1).

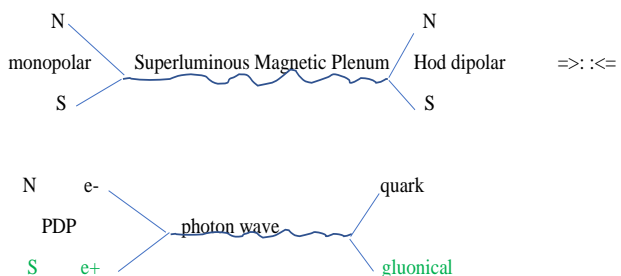
**Figure 12:** The state of the clocks versus environment interactivity (schematical outlines). Legends explain how the environment affects the state of the clocks, especially in quantum relativistic way. Superimposition of analog clock on mapping [state of the clocks] versus [environment] we get time core information-time comparing quantum global mapping quantum local. One may surmise that environmental point  $\langle 1 \rangle \langle - \rangle \langle 5 \rangle$  may represent conscious mind, then point  $\langle 1, 2 \rangle \langle 3 \rangle \langle - \rangle \langle 4, 5 \rangle \langle 3 \rangle$  may represent subconscious mind, point  $\langle 2 \rangle \langle - \rangle \langle 4 \rangle$  may represent unconscious mind states existing within environment!!

Analysis of Switches States Equations (14)&(15) Quaternion Matrix



**Figure 13:** The graphical solutions to Equations (14) and (15) having  $q_g = \text{on-off} * \text{on} + \text{off-on} * \text{off}$  to give prime number values:  $pf1 = 1 = \text{on-off}$ ,  $pf0 = \theta = \text{off-on}$ , refer to the main text as well. **Keynote:** scalar space gauge field can also be written in square bracket notation like:  $[0 \text{ off-on } 1 \text{ on-off}]$  switching analog form to indicate mode of switches, with 0 indicating no switches or vacuum; off-on indicating mostly off-mode but coming on or flickering; 1 indicating mode on condition switches; on-off indicating mostly on but mode coming off or fluctuating.

**Geometry of space:** dimensionless {point, Superluminous, Plenum, magnetic, quagmire} to dimensional {Hod, dipole, magnetic, planar field} to {PDP, clockwork, assembly, discontinuum, mechanism} to {particle, photon, quark, gluonical, matter} Graphically, flowchart like Feynman diagram (Figure 14) providing the process of north and south monopoles within get mediated by Superluminous Magnetic Quagmire Plenum to create Hod-dipolar planar magnetic rigid entity having high energies to breaking symmetry to create quasi-particles generating electron-positron pair to assemble with north-south monopoles to create PDP circuit clockwork mechanism. Through photon wave (produced by Hod) mediation, the Hod-PDP assembly induces quark-gluonical particle to matter forming. This process has been graphically sketched below. Hod\_Plenum mechanism is the key to the author's collaborative coauthor John Hodge's Scalar Theory of Everything PHYSICS.



**Figure 14:** Two Feynman-like diagrams.

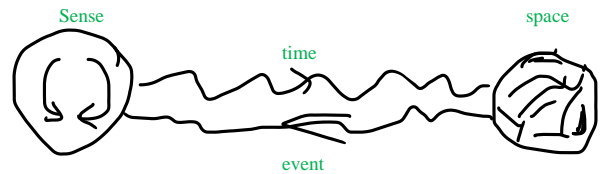
## **Dimensional conjectural physics shifting paradigm**

In a gist manner, we can extend physics conjectures to make sense by justifying dimensions of various entities that make up the universe, listed briefly here in **Table 2**.

**Table 2:** The entity and expected property for several dimensional ranges. Note that adsorption signals may occur with Hod, as well as with Hod-PDP clocking mechanisms.

<b>Dimensional range</b>	<b>Entity and expected property</b>
<b>0 to 1</b>	<b>Superluminous Plenum that may be noisy, however not observable</b>
<b>1 to 2</b>	<b>Open strings, typically 1D; Closed strings or loops, typically 1D to 2D</b>
<b>2</b>	<b>Hod that will not have thickness, hence transparent not observable</b>
<b>2 to 3</b>	<b>Quasi-particles, particles like fermions and bosons - potentially observable</b>
<b>3</b>	<b>Matter universe general Euclidean observable</b>
<b>3 to 4</b>	<b>Space-time manifold, for instance, blackholes observable effects</b>
<b>4 to 5</b>	<b>Hod-PDP assembly dynamics, effects quantum physically interpretable</b>

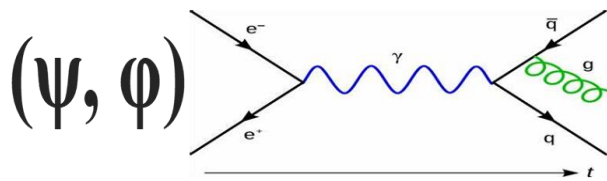
We can sketch time-event connecting sense rotations with geometry of space per **Figure 15**.



**Figure 15:** The diagram for time-event connecting sense to space.

### **Theoretical Algorithm Graphing wave particle real link value**

Let's treat the diagram shown above in Figure 5. In the figure,  $\Psi$  is the wavefunction of electron positron pair and  $\phi$  is the gage field function with phase angle can be evaluated from designs experimental measurements shown per Figures 6 and 7. Hence, values of  $(\psi, \phi)$  can be evaluated to complete quantification of the following process diagram:

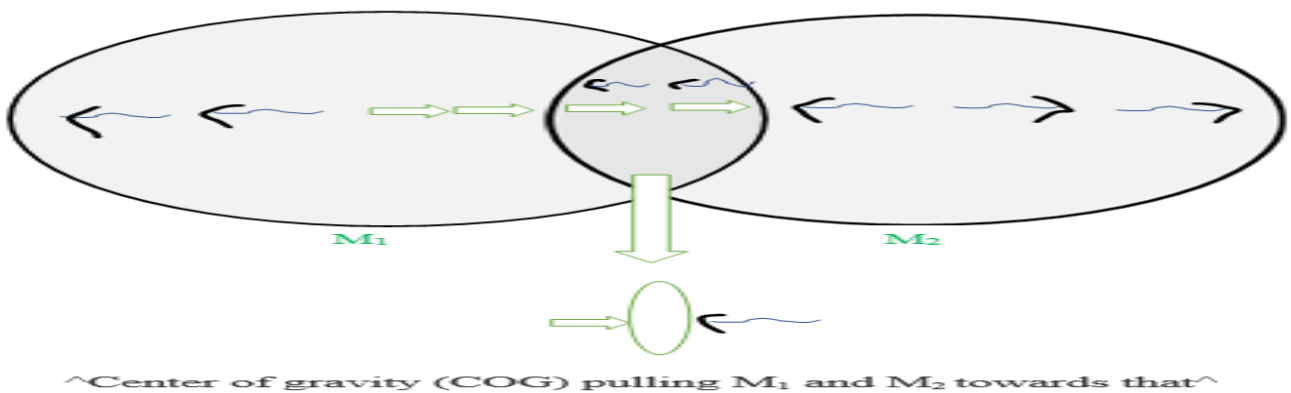


**Figure 16:** The Feynman-like diagram of electron-positron mediated by light photon to generate quark, antiquark, as well as gluon in the time scale. The retrofitting of this diagram upfront with the wavefunction and phase angle per Figure 5 scheme will help to establish particle quantum conditions. This algorithm graphing with ITSTEM physics will have several usages, especially quantum computing applications. The whole assembly with software algorithm with hardware particle will help to stabilize quantum computer equipment self-correcting operationally calibrating accessories that maybe supplied alongside eventual quantum computer internet technological systems.

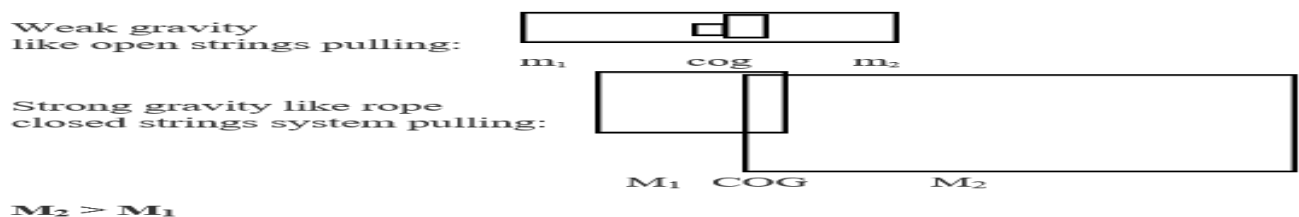


## **Strong gravity versus weak gravity thesis PHYSICS**

- (1) Strong gravity will act like a rope which is a braided (closed) bundle of strings system able to pull large weight, whereas weak gravity will act like a stranded (open) or string pulling. Strong gravity will all be like rope that is closed braided bundle strings' system pulling large weight by acting together with rope as one unit, hence having the stress tensor to pull object towards center of gravitational mass.
- (2) Weak gravity may be observed as a horizontal force on tangential plane of a stratified geodesic like the Earth having spherical concentric equidensity-matrix stratified towards the mass center like a sphere approximately, increasing pressure (hence density matrix) towards gravity center. Weak gravity models as fiber transform (open) strings pulling object. Weak gravity is like normal acceleration, whereas strong gravity is like acceleration due to gravity.
- (3) Gage\_velocity links weak gravity to strong gravity. Equivalence principle thus will apply linking weak gravity to strong gravity. While there is a gravitational acceleration linking strong gravity, there is normally conjugate acceleration associated then the weak gravity.
- (4) Quantum density matter-energy field spreads away object influence onto environment to almost infinity. Strong gravity high-density fields lead to warping to eventual causality curving the geometry of space-time to form, for example, black holes. Weak gravity timeline interweaves strong gravity worldline carrier waves. earth is affected by curving of interweaving worldline with timeline events.
- (5) Causality of the weak gravity particle-particle collision interaction of density fields of object influence on other environmentally separated objects produces chaining of concomitantly sequential action reaction processes naturally happening.



**Figure 17:** Spreading of density matrix from  $M_1$  and  $M_2$  massive objects pulling towards center of gravity (COG).



**Figure 18:** The matter masses  $m_1$  and  $m_2$  are like open strings pulling on each other, representing weak gravity. Matter masses  $M_1$  and  $M_2$ , with  $M_2 > M_1$  are like rope constituting braided bundle of the strings together, pulling on each other acting like closed strings system of strong gravity.

### Explaining interpretations physics discussing propositions

**Figure 17** shows how matter spreads mass forming distributed density matrix over space. Then each object will have its own sphere of influence interacting through density matrix, having attractive versus repulsive forces to occupy space. We know that non-bosonic (nonlight) matter will not overlap occupation of space, meaning one particle, such as fermions occupying one point in space displace another particle trying to occupy its space. This will generate the action-reaction sequence of collisions, like thermodynamics of ideal gas particles, creating center of gravity (COG). while equilibrium of motion vectors culminates resultants at intersecting regions balancing opposing vectors, shown as lenticular region at interaction intersection of the two objects' spheres of influence. With this scheme, we can deduce that massive objects having larger density matrix will typically have relatively stronger spheres of influence over lighter objects having a smaller density matrix. The pulling towards COG will be a resultant of opposite vectors cancelling one another. Note that actual vector alignment is not drawn explicitly. However, translational property of vectors will imply equilibrium with balance of density matrix vector forces. **Figure 18** shows how types of force pulling on one another towards COG can create strong gravity versus weak gravity. To demonstrate simply weak gravity, one can test with a single strand string to pull certain object; it can only pull weakly. Whereas strong gravity will act like a rope braided multiple strands of strings that can pull heavily. Here, strong gravity works analogous to closed strings that are joined at the ends and hard to break or stretch out. Weak gravity works analogous to open strings that are loose at the ends and easier to break or stretch out.

### Action of Strong Gravity versus Weak Gravity Transforms

- ❖ Quantum levels strong weak gravity operator.
- ❖ Strong gravity predominates at astrophysical level.
- ❖ Weak gravity predominates at mesoscopic level.
- ❖ Gravity-time-event mesoscopic interactive energy matter environment.
- ❖ Possible wormholes through astrophysical to quantum.

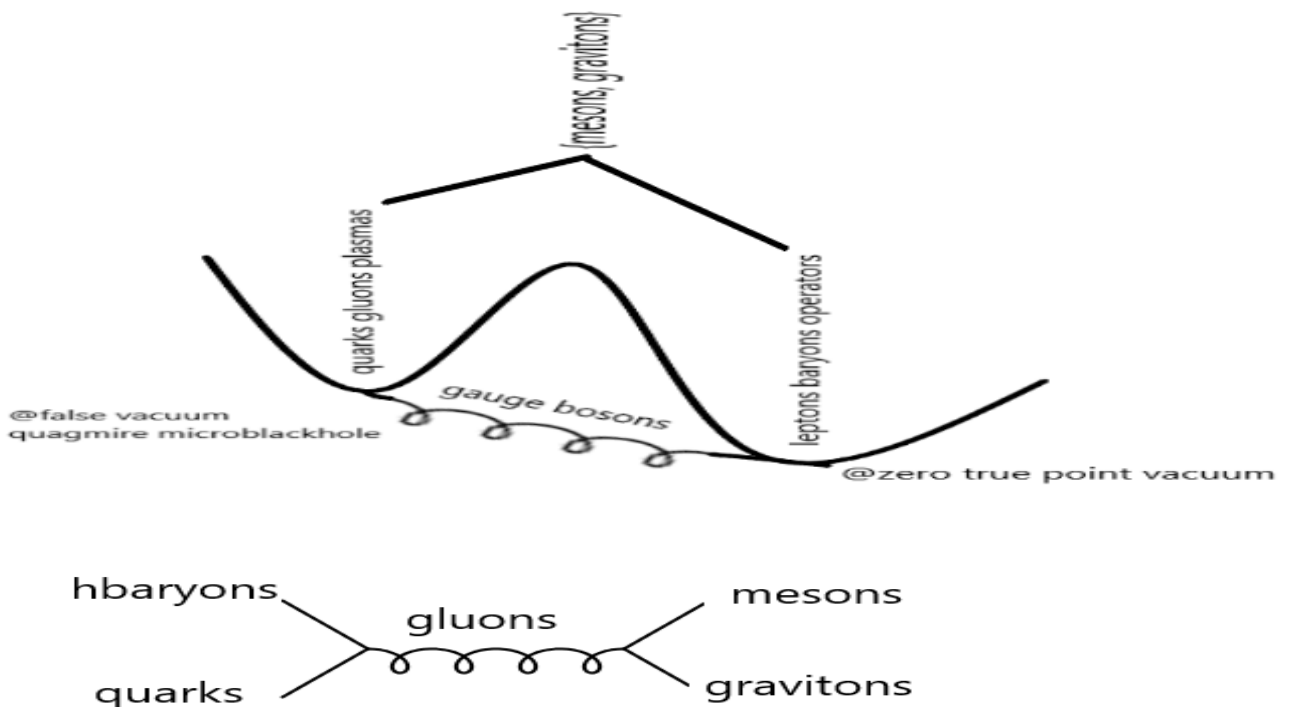
### Question of true false vacuum, weak, and the strong energy

Per Figure 12, quaternion switch state on/off will give about state of the clock indicating energy minima or maxima. Quantum field theory posits two energy minima false and true vacuum. It is possible to conjecture false vacuum to be minimum energy with higher absolute temperature, versus true vacuum minimum entropy with lower absolute temperature. Hadrons mesons (2 quarks) gluonic bosons constitute maybe higher temperature phases hence the false vacuum. Hadrons baryons (3 quarks) such as gravitonic fermions constitute maybe lower temperature phases with true vacuum. vacuum oscillations possibly extending to true false vacuum, barrier between them might have time space oscillatory characteristics, generating super crystal defects. Possibilities arise having Casimir effect {alter the vacuum expectation value of the energy of the second-quantized electromagnetic fields} in submicron range micron to nanometer [<https://physicsworld.com/a/the-casimir-effect-a-force-from-nothing/>]. Whereas capillary action can occur at mesoscopic level 200 microns to meters [[https://en.wikipedia.org/wiki/Capillary\\_action](https://en.wikipedia.org/wiki/Capillary_action)]. Quantum tunneling occur @nanometer level [[https://phys.libretexts.org/Bookshelves/University\\_Physics/Book%3A\\_University\\_Physics\\_\(OpenStax\)/University\\_Physics\\_III\\_\\_Optics\\_and\\_Modern\\_Physics\\_\(OpenStax\)/07%3A\\_Quantum\\_Mechanics/7.07%3A\\_Quantum\\_Tunneling\\_of\\_Particles\\_through\\_Potential\\_Barriers](https://phys.libretexts.org/Bookshelves/University_Physics/Book%3A_University_Physics_(OpenStax)/University_Physics_III__Optics_and_Modern_Physics_(OpenStax)/07%3A_Quantum_Mechanics/7.07%3A_Quantum_Tunneling_of_Particles_through_Potential_Barriers)]. At



quantum subquantum levels, like with Hod-PDP mechanism and Planck processes, vortex and the gradient gauge fields of Helmholtz decomposed point matrix fields PHYSICS FORMALISMS originated per Iyer Markoulakis approach may play key role in the vacuum energy phases. With these mesoscopic to quantum mechanisms, we conjecture that minimum energy higher temperature phase may have vortex fields that can generate vacuum loops, having speed of light propagation consistent with quantum field theory predictions of vacuum bubbles expanding onto the universal level. Additionally, at the minimum entropy lower temperature phase it may have gauge gradient fields that constitute fermionic or baryonic oscillations, like brought out above. Microblackholes or blackholes may correspond to the former with vortex gauge fields, while zero-point may correspond to the latter gradient gauge fields!! False vacuum may thereby constitute microblackholes with true vacuum zero-point states thus can create energetically favorable nucleus originating out of microblackhole within atomic decay of false vacuum states, while electrons pop up at zero-point true vacuum states possibly coexisting to create matter from generation of hydrogen atoms with isotopes to initiate fusion reactions within galactical stars operationally!!

**How baryons, gravitons, and gluon quark mesons synthesize**



**Figure 21:** Schematics showing synthesis {weak, strong} system generating particle spectra producing {mesons, gravitons} out of {quarks, gluons} plasmas at the false vacuum quagmire microblackhole (fvqm). Mediating environment gauge bosons combine {leptons, baryons} operators at zero true point vacuum (ztpv). Gage unifying original Iyer Markoulakis point PHYSICS with Standard Model’s mathematical quantum field theory unifies weak and strong fields of nuclear with gravitational gravitons to electromagnetic leptonic fermionic fields. The author’s viewpoint graphics bring out the probable possible gage unified symmetry gauge fields.

*The true vacuum may act as receptacle to constitute leptons, baryons operating fields within zero point decomposed Helmholtz quagmire, while the false vacuum may act like crucible synthesising the strong interactions of quarks, gluons, plasmas activating in the presence of the gauge bosons. These are systemically feasible if there are microwormholes linking false vacuum microblackholes with true zero pathway point vacuum. They resultantly generate gravitons, mesons radiating emanating from such configurations within sense-time-space manifolds!! All these are brought out in the following schematics of how they come together and how the Feynmann diagram may be sketched to show the synthesis proceses to foster future PHYSICS project!! Micro macro connection of quantum level processes to astrophysical gaging is made possible with this PHYSICS paradigm!!*

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