Unconventional reconciliation path for quantum mechanics and general relativity

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Research Article

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Abstract

Physics in general is successfully governed by quantum mechanics at the microscale and principles of relativity at the macroscale. Any attempts to unify them using conventional methods have somewhat remained elusive for nearly a century up to the present stage. Here in this study, a classical gedanken experiment of electron-wave diffraction of a single slit is intuitively examined for its quantized states. A unidirectional monopole field as quanta of the electric field is pictorially conceptualized into 4D space-time. Its application towards quantum mechanics and general relativity in accordance with existing knowledge in physics paves an alternative path towards their reconciliation process. This assumes a multiverse at a hierarchy of scales with gravity localized to a body into space. Principles of special relativity are then sustained along inertia frames of extra dimensions within the proposed model. Such descriptions provide an approximate intuitive tool to examine physics in general from alternative perspectives using conventional methods and this warrants further investigations.

Keywords: monopole, 4D space-time, quantum mechanics, general relativity, multiverse
1.0 Introduction

Since the late 1800s to early 1900s, knowledge acquired in increments for the microscale with the advancement of proper experimentations has come to successfully form a fundamental theory of the atomic state known today as quantum mechanics. An unexhausted list of scientists that contributed to the development of the theory during this period of time can be found in any common textbook. It was only during the 1920s that the theory was fully construed in what came to be widely known as Copenhagen interpretation, a phrase attributed to Niels Bohr and Werner Heisenberg [1]. The interpretation relates to the fundamental level where both particle-like and wave-like characters exhibit wave-particle duality. Similarly, neutral to charged particles possess superposition states of spins in probabilistic distributions. Both of these quantum features appear somewhat counterintuitive to everyday notions offered by classical mechanics. In order to account for each of the weirdness of quantum mechanics, other alternative versions like Everett’s many-worlds interpretations, quantum Bayesianism, De Broglie-Bohm theory among a few others exist. But these are not as popular as the Copenhagen interpretation based on experimental outcomes conducted so far.

Coinciding with the development of quantum mechanics in which Albert Einstein also played a key role in defining the particle property of light waves as photons [2], he further formulated his two prominent relativistic theories [3]. Special relativity accounts for constant lightspeed of wave-particle duality in a vacuum for all accelerating inertia frames of reference. Likewise, it denotes mass-energy equivalence for matter into space in one of the most famous equations in physics, \( E = mc^2 \). Their combination with quantum mechanics paved the path for the emergence of the quantum field theory (QFT) and this provides the link between the
microscale and the macroscale or the classical level (Fig. 1). The process first began in the early 1930s with Paul Dirac’s initial proposition of the existence of antimatter [4] in the form, $e^+ e^- \rightarrow 2\gamma$, where an electron annihilate with its antimatter to produce two gamma rays. Such a prospect was further promoted by Richard Feynman [5] in the late 1940s using path integral diagrams where particles couple to their antimatter to generate different force types like electromagnetism, weak and strong nuclear forces. Except for gravity, the combination of the particles and forces in accordance with experimental findings was successfully completed over the next few decades through the development of the QFT known as the Standard Model (SM) [6]. The SM theory of elementary particles employs very complex mathematical formulations to account for a plethora of particle types observed in high energy experiments. Its final prediction culminated in the discovery of the Higgs boson in 2012 [7] where its existence was predicted in the mid-1960s [6].

![Figure 1. A simplified flow diagram demonstrating the gap in conventional methods towards the unification process of quantum mechanics and general relativity.](image)

Depending on their spins, charges and masses, the fundamental particles in the SM are categorized either as fermion or boson types. The bosons are of whole integer spin (0 to ± 1) and these are considered to have been generated from the coupling of fermions and their antimatters
(i.e., particles of ±1/2 spin to other fractional spin types). The bosons mediate the field forces of electromagnetism, weak and strong nuclear forces. A different boson type of spin 2 (graviton) is assumed to mediate gravitational force but this has not being detected yet in experiments [8]. Its eventual discovery and incorporation into an extended SM is expected to provide the unification path of quantum mechanics and general relativity at the fundamental level [9]. However, one major constraint to such endeavor is that gravity is envisioned to weakly manifest at the Planck’s length of approximately 10 cm\(^{-34}\), a scale of very high energies not accessible yet in current experimental undertakings [10].

At the macroscale, Einstein’s other landmark theory of general relativity successfully integrates classical Newtonian gravity and some aspects of special relativity such as the equivalence principle (Fig. 1). Its fundamental principle envisages space-time curvature due to the presence of matter into space [11]. This is interpreted as matter curves space and space tells matter how to move. Overtime, experimental findings and new theories have evolved to affirm the accepted common knowledge in both quantum mechanics and general relativity as the two pillars of physics at two extreme scales. To date, any attempts to unify them using conventional methods such as the QFT applications of the SM or the theory of quantum gravity and a few others remained fairly constrained since earlier attempts by Einstein in the 1930s [12]. One major constraint faced by such endeavors is that these methods are fairly grounded on abstract mathematical tools that are largely driven by empirical data or vice versa. Hence, for this study, a non-mathematical approach of a conceptualized form is considered towards the reconciliation process of quantum mechanics and general relativity. This is briefly outlined below.

A classical Einstein’s gedanken experiment of electron-wave diffraction of a single slit [13] is pictorially examined for its quantized states. Condensed electric field, \(E\) of the wave
diffraction generates a unidirectional monopole field (UMF) as its quanta [4]. Each monopole pair (MP) field is of an elliptic shape and this is dissected linearly along inertia frames of magnetic field, $B$. The frames are converted to Bohr orbits (BOs) of quantized states in degeneracy into extra dimensions along orbital paths. These are in thermal equilibrium to the overall UMF. Intermittent precessions of the MP field within the domain of the UMF into forward time are defined by Planck’s radiation. This breaks time reversal symmetry induced by gravity on the orbital paths. These intuitions somehow adhere to the principle of general relativity, i.e., space tells matter how to move and matter tells space how to curve [11]. The former is accommodated by precession of the MP field into forward time and this resembles a clock face. The latter is associated with the orbital structures undergoing precession of time reversal symmetry due to gravity. Such scenarios imply that both superposition states of quantized fields or particles and time dilation are sustained along the inertia frames of BOs at the microscale unlike the macroscale. All these descriptions offer a conceptualized MP model into four-dimensional (4D) space-time or 3D space plus 1D time. Its application to physics in general is able to integrate well existing knowledge for both the microscale and the macro level into proper perspectives. This assumes a multiverse at a hierarchy of scales with Newtonian gravity localized to a body into space. The structural frames of the MP models are indistinguishable at observations with relativistic properties of $E = mc^2$ and the equivalence principle sustained along the inertia frames of BOs. Such outcomes provide a tangible unification path for quantum mechanics and general relativity. Similarly, the proposed model offers a dynamic intuitive tool that can be applied to explore physics in general from alternative perspectives using conventional methods, perhaps in incremental steps and this warrants further investigations.
2.0 Conceptualization process of an MP model

The conceptualization path of the MP model is attempted from a classical gedanken experiment of electron-wave diffraction of a single slit. First, the process is devised using pictorial demonstrations. Second, the model is validated by applying a generalized renormalization process based on common knowledge in physics. Third, its notable limitations are examined with suggestions offered on how these can be intuitively accommodated into a probable state of 4D space-time. The final outcome offers a dynamic intuitive tool and this is applied to explore physics in general from the microscale to the macro level wherever applicable.

2.1 A pictorial demonstration

An observer at a slit sees ripples of spherical waves receding into forward time for an emitting electron source (Fig. 1a). The electron possesses both isospin, $I_z$ and energy-momentum, $\Phi$. On expansion, the former is projected as arrow of time, $\vec{I}$ in asymmetry of unidirectional and this is dissected perpendicularly along inertia frames of $\mathbf{B}$ into straight paths. The condensed boundary of $\mathbf{E}$ encompasses $\vec{I}$ at a minimal energy level of Planck’s constant, $h$ (i.e., $6.626 \times 10^{-34}$ joules per second). This insinuates a UMF of multiple MP fields (Fig. 1b). The emergence of orbital structures within a MP field somewhat mimes a UMF background in thermal equilibrium (Fig. 1c). The orbitals are quantized linearly along inertia frames of BOs defined by $\Phi$. These are of degenerate states into extra dimensions in time dilation, $I_{z\parallel}$ due to gravity with respect to $\vec{I}$ of unidirectional (Fig. 1d). Thus, precession of the MP field into forward time at minimal energy is
Figure 1. A step-by-step conceptualization path of the MP model. (a) Expansion of electron-wave diffraction from an electron source in a single slit setup towards detectors A and B. (b) $\vec{I}$ in asymmetry is incorporated by the UMF (green loop) and this includes the emergence of a MP field (gray area) into 3D
space. An octet shape of inertia frames is enclosed within a circular $E$. Coherence is epitomized by the wavelength, $\lambda$ for conservationism. (c) Emergence of orbital structures within the MP mimes the UMF background in thermal equilibrium. These are quantized along BOs of $B$ in degeneracy into extra dimensions, $n$. (d) The MP field of 3D space is transformed into 4D space-time of unidirectional in flat space. A particle (green circle) in motion such as an electron along orbital paths (pink dotted lines) is quantized via BOs in degeneracy. Miniature wave function, $\psi$ (blue wavy curve) of gravitational type below Planck’s scale traverses the orbital paths. The electron transition between two orbitals from point $x \rightarrow \hat{x}$ (pink area) due to precession equates to $\pm h$ for the MP field (white area). This is bounded by unidirectional $\psi$ (green wavy loop) in equilibrium to $\vec{I}$ (blue arrows) in asymmetry. Expulsion of $h$ during observation unveils superposition of $\pm \frac{1}{2}$ magnetic spin ($m_i$) along quantized states of BOs (navy colored cones). The scenario is attributed to the effects of gravitational time dilation where external light paths along BOs spiral inwards towards the center. Hence, the orbitals are somewhat precessing in time reversal to forward motion of the UMF (green arrows). All these descriptions allude to the dynamics of a MP model of a spherical electron cloud model (gray area) into 4D space-time in flat space.

defined by Planck’s law, $E = nh\nu$ and this is balances out the orbitals precessing into time reversal. In this way, both fields and particle-like properties in superposition states are applicable at the $n$-levels of BOs into extra dimensions. The equivalence principle of $E = mc^2$ at a defined frequency, $\nu$ of the electromagnetic radiation or light wave is sustained along BOs (Fig. 1d). In the absence of any external disturbance, the Planck’s radiative process breaks time reversal symmetry in accordance with the application of 2\textsuperscript{nd} law of thermodynamics, i.e., $E = nh\nu/c$ and this mimes a clock face. Singularity is then defined by $ih$ at a minimal energy level of $2\pi$ for precession into forward time at Planck’s scale. Such descriptions imply that the inertia frames of BOs and the boundary of the MP model remain indistinguishable at lightspeed (i.e., mass-energy equivalence) in a multiverse and these somehow offer an electron cloud model into 4D space-
time for the atomic state. Thus, the model is applicable to either one-electron atom such as hydrogen for a MP field or multielectron atoms for multiple MP fields. The electrons probability distributions along the orbital paths are in accordance with Pauli exclusion principle. In the subsequent subsections, the model’s compatibility to a renormalization process and limitations are explored.

2.2 A generalized renormalization process

The conceptualization path of the MP model can be conceived in accordance with common knowledge in physics. Commencing from the electron source towards the generation of space-time, the process is conceived by a triple integral in the following manner

\[
\int_{-\infty}^{\infty} dI_z d\phi \rightarrow \int_{-\infty}^{\infty} \int_{0}^{\pi} nI_{z||} d\phi d\Omega \rightarrow \int_{-\infty}^{\infty} \int_{0}^{\pi} \int_{0}^{2\pi} nI_{z||} d\phi d\Omega d\theta .
\]  

(1)

Perpetual rotation of UMF into infinite (∞) space-time is defined by \( h \) in infinitesimal steps and this is normalized to \( 2\pi \) at minimal energy state for the spherical electron cloud model (Fig. 1d). \( I_{z||} \) due to gravity is attained along the quantized states of the orbital paths at the \( n \)-levels and this mimes inertia frames of BOs in degeneracy in reference to \( \vec{T} \) or principal axis of the MP field in asymmetry (Fig. 1d). Non-relativistic position of a particle in orbit or quantized state of BO into 3D space at a point in time \((x, t)\) is defined by the spherical polar coordinates \((\Omega, \Phi, \theta)\). The symbol \( \Omega \) equates to the number of configurations of the MP field undergoing precession in a circular motion into forward time. \( \Phi \) is the energy momentum of BO as mentioned earlier and \( \theta \)
is the angle between $I_{z\parallel}$ and $\vec{I}$ with respect to singularity at the electron source. The designation of $\Phi$ for the quantized states of BOs into degeneracy in $N$-dimensions of Hilbert space somehow mimics a Higgs field (Fig. 1b and c) where a plethora of particle types are envisioned. All these explanations advocate for a 4D space-time model of unidirectional in flat space.

Any increase in applied external energy is expected to produce light cones along BOs at an $n$-level by expulsion of $h$ and leveling of the degenerate states (Fig. 1d). Such a process is accorded to the normalization of Equation 1 in the form

$$nl_{z\parallel}\int_{-\infty}^{\infty} d\Omega d\phi d\theta = 1$$

(2)

where the integral incorporates the path covered by the particle in orbit and is of time invariance for the MP field. From the first principle of the quantum $\Psi$, a particle’s position in orbit can be further defined by the Hamilton-Jacobi relationship of the type

$$nl_{z\parallel} = abc\Omega \sin \theta$$

(3)

The parameters $abc$ represent lengths of semiprincipal axes of a BO (Fig. 2). Renormalization then takes the generalized equation

$$\frac{a^2}{x^2} + \frac{b^2}{y^2} + \frac{c^2}{z^2} \leq 1$$

(4)
where the volume of the ellipsoid is given by \( v = \frac{4\pi abc}{3} \). Projection of BO into extra dimensions along the \( x \)-axis or alternatively \( \vec{I} \) generates quantized energy states at \( n \)-levels (Fig. 2).

**Figure 2.** An MP field of elliptic shape. The sphere along the \( z \)-axis/\( l_z \parallel \) is comparable to a BO, while the \( x \)-axis identifies \( \vec{I} \) in asymmetry. If \( z \)-axis mimes \( B \), \( y \)-axis equates to \( E \).

Alternatively, Equation 3 can be expanded into the form

\[
dxdydz = abc\Omega^2\sin\theta d\Omega d\Phi d\theta
\]  

(5)

where \( \Omega^2 \) encompasses multiple configurations of the MP field during precession stages of the UMF of a clock face. To an external observer, a particle in orbit is always in a superposition state of \( \pm \frac{1}{2} m_i \) along the BOs due to continuous precession into forward motion and time reversal exerted by gravity. The magnitude of the \( \Psi \) is depended on the size of the object interacting with photons travelling on a straight path. For the particle transition between two orbitals from point
\( x \rightarrow \hat{x} \) (Fig. 1d), this follows Born’s rule in the generalized form

\[
nl_2 \int_{-\infty}^{\infty} \Psi^* \Psi \, d\tau = 1
\]

(6)

where \( d\tau = dx\,dy\,dz \) and this identifies with a point along BO defined by \( nl_2 \| \). Equation 6 holds true from the first principle where the \( \Psi \) is applicable to all constants such as an electron or individual quantized states of BO. Such intuition forms the basis for the physical derivation of Schrödinger’s equations. External light application at a point-boundary of the MP model is expected to generate standing waves in 2D space of a continuum mode (i.e., Euler’s formula). This is defined by the relationships

\[
\Psi = A \sin \frac{2\pi x}{\lambda} \quad \text{or} \quad B \cos \frac{2\pi x}{\lambda}
\]

(7)

where A and B are constants with \( \lambda \) projected along the \( x \)-axis. All these descriptions offered in this section allude to the dynamics of the MP model into 4D space-time.

2.3 Limitations

The most obvious question arises from what powers the precession mode of the MP model into forward time in a perpetual motion and in turn violate the laws of thermodynamics? By linking precession to \( \pm \hbar \) for the MP field of time invariance along \( \vec{I} \) at Planck’s scale, this breaks time
reversal symmetry imposed by gravity in accordance with 2nd law of thermodynamics. Perpetual rotations in one direction then offer a miniature clock that probably mimes a large time clock since the Big Bang. Further details are provided in the final section of this paper.

Because superposition state of $\pm \frac{1}{2} m$, is attained along BOs into extra dimensions as mentioned earlier, the actual observation of the orbital structures into 4D space-time violates lightspeed of time dilation (i.e., an entanglement scenario). Hence, current models of the orbital structures in quantum mechanics are limited to the $\Psi$ of hydrogen atom into 3D space at a point in time $(x, t)$. Such intuitions are highly speculative but somehow these cannot be effectively addressed by the principle of Occam’s razor. For example, the principle underlies conventional methods and this requires simplicity or empirical data, such as from point A to point B in either 2D to 3D space-times or 1D to 3D spaces. In the process, any intricate details, intuitions or complexities between the two points in a possible 4D space-time are overlooked. In addition, even to translate the large data gathered in various interrelated disciplines in physics and collate them into a proper perspective of 4D space-time remains lacking. Without any new insights offered by experiments, the way forward for physics seems to have reached a stalemate.

Furthermore, the SM theory has been quite successful in integrating the known elementary particles and the three force types of nature, i.e., electromagnetism, weak and strong nuclear forces [6]. However, beyond that, it appears inadequate to account for quantum gravity, dark matter and dark energy among others in the absence of new empirical data [7].

Thus, in order to further ascertain the dynamics of the orbitals structures or the rigor of the MP model into 4D space-time (Fig. 1d), this is weighted against common knowledge in physics. By doing so, physics is explored from the perspective of 4D space-time towards the minimal dimension of 2D space-time rather than the other way around using conventional
methods. Currently, there are no existing studies in physics that have pursued such a path before to avoid being metaphysical. To maneuver through this hurdle, the proposed model’s compatibility to a renormalization process is first established as shown in the preceding subsection. In the subsequent sections, its applicability to symmetry is conceived before examining its relevance to existing knowledge in physics for both the microscale and the cosmic level wherever applicable.

3.0 MP model versus symmetry

Symmetry at the fundamental level is governed by the Noether theorem and this assumes energy conservation. Its applicability requires the existence of both matter and antimatter as first proposed by Dirac [4] for the electron-positron pair. Evidences of antimatter are provided by the discovery of positron [14] and stern-gerlach experiment of $\pm \frac{1}{2} m_s$. Beyond that, other empirical data for the existence of supersymmetric partners or microscale black holes are still lacking [7, 15]. While these are still being investigated into ongoing research developments, an intuitive demonstration of symmetry for $\pm \frac{1}{2} m_s$ from Fig. 1d is expounded in Fig. 3a. By assuming a multiverse at a hierarchy of scales, the process is applied to the solar system (Fig. 3b). Because $E = mc^2$ and the equivalence principle are sustained along inertia frames of BOs, the structural frames of the MP model remain hidden to observations into forward time. Perhaps, the effects of gravitational time dilation allow for the observation of a $\pm$ monopole field at a point in time. Spiraling of time dilation along BOs at lightspeed towards the gravity source offer a level of superposition states for the orbital paths (i.e., light cones). In this case, conservation of energy,
magnetic momentum, angular momentum and center-of-mass are sustained with respect to singularity at the center. For example, forward time is defined by $h$ and this breaks time reversal symmetry induced by gravity. Both magnetic moment and angular momentum are attained along quantized states of BOs and these are of approximately constant distance from the center-of-mass at singularity. Perhaps the major differences between the microscale (Fig. 3a) and the macro level (Fig. 3b) are the force of gravity and the area of the light applied on the object during observation. In the former, gravity is extremely weak for the microscale such that the

![Figure 3. Observation of actual orbital paths during precession violates lightspeed due to localization of gravity. Thus, a particle extracted in an upward direction at position 1 (a) offers $+\frac{1}{2}$ spin into forward time (blue dotted curve and arrow) and vice versa in a downward direction at position 2 (brown dotted curve and arrow). The former is attributed to precession of UMF into forward time and the latter to internal orbital structures undergoing gravitational time dilation. In this way, the quantized states of BOs sustain superposition of $\pm \frac{1}{2} m_s$ into extra dimensions. (b) Similar process is](image)


perhaps applicable at a higher hierarchy of scale for Mercury’s orbit [16]. Shifts in the perihelion precessions due to gravity are more accessible to an external observer on Earth unlike the microscale. \( X' \) represents matter (e.g., Mercury) into forward time and \( X^- \) is the apparent position for the antimatter field owed to the effect of gravitational time dilation. The former is not drawn according to spatial distance. \( \Omega = \) number of configurations for the orbital undergoing gravitational time dilation, \( \omega = \) perturbation of angular velocity and \( \varphi = \) is the measure of magnetic flux or BOs into extra dimensions between two MP fields.

difference between precession and gravity is attained by the \( h \) value or Planck’s length (e.g., Fig. 1d). Any elimination of \( h \) towards BOs allows for the manifestation of superposition of \( \pm \frac{1}{2} m_s \) in probabilistic distributions BOs. Because the area of the applied light is more than the atomic state, both matter and antimatter are observable depending on the instrumental set-up. At the macroscale, the reflected light rays are less than the area of the planet and thus, superposition states are not readily applicable to a human observer. Instead, a monopole field and its interaction with light path and time dilation are measurable. Such intuitions demonstrate how both conservation and symmetry features are attained into 4D space-time. Establishing these features offers a dynamic intuitive tool that can be applied to examine physics in general for both the microscale and macroscale from an alternative perspective and this is presented next.

### 4.0 MP model versus various aspects of physics

In this section, the model’s relevance to both classical and quantum physics is offered. Such a process is expected to integrate a number of physics themes based on experimental outcomes into proper perspective. At the moment, this is lacking from current observations and theories
without any forthcoming new insights from experiments despite the advancement of instrumentation made in recent times [17]. In Fig. 4, the treatment of the MP model to various physics themes is demonstrated. Some of these include Planck’s radiation, wave function collapse, Euler’s formulation, Schrödinger equation, Bohr’s model, electromagnetism and so forth. These are briefly expounded below in bullet points.

**Figure 4.** The presence of matter within the MP model insinuates a wave function, $\Psi$, into 4D space-time. This is reduced to either 2D or 3D space at a point in time during observation (i.e., a wave function collapse scenario). How some of the major physics themes fits into this conceptualized process are incorporated and expounded further in the text.
Wave function collapse: A light beam travelling on a straight path and its interaction with a precessing MP model into forward time registers standing waves of Euler’s formulation into 2D space (e.g., Equation 7). The presence of matter (an electron in orbit) smoothen out the precession stages of the MP field and insinuates the emergence of a physical $\Psi$ into 4D space-time. During observation, this adds a spike to the standing waves in the quantized form, $E = n\hbar v$ for the wave function collapse into 3D space-time (Fig. 4). The output signal, $\lambda$ equates to $\hat{x}$ or the expectant value. A range of values can be expected from continual precession of the object in orbit into extra dimensions. For the electron, De Broglie relationship, $\lambda = h/p$ defines its wave-particle duality. Its momentum, $p = mv$ is attained along BO with $m$ equal to mass and $v$ is velocity along the orbital path. The shift in the position of the electron between two orbitals into space, i.e., $x \rightarrow \hat{x}$ resembles $\Psi \rightarrow \Psi'$ transition in accordance with Born’s rule for complex probability amplitudes (Equation 6). A level of complexity is attained for the electron into 4D space-time (e.g., Fig. 1d). The Heisenberg uncertainty principle, $\Delta x \cdot \Delta p \geq \hbar/2$ defines the electron’s position, where $\hbar/2$ incorporates the orbital pair within the MP field into 2D space at minimal energy level. Normalization of precession at the point-boundary of the MP model (between two orbital paths) for the electron’s position is defined by Euler’s formulation and this offers a level of indeterminacy, i.e., $i\hbar$ (Fig. 1d). Any information transfer between the electron and the photon incorporates the quantum parameters, $n$, $l$, $m$ and $m_s$ values. Their applicability to one-electron atom like hydrogen is demonstrated in Fig. 4. For example, the $n$-level is related to the extra dimensions, $l$ is defined by the orbital paths, $m$ is attributed to BOs in degeneracy and $m_s$ corresponds to the light cones for both the past and future scenarios. Gravity due to time dilation offers the present
stage. Because of either decoherence or Planck’s radiation in accordance with 2nd law of thermodynamics, the past is not always equal to the future or vice versa. Such intuitions further imply that an electron in orbit into 4D space-time can penetrate through both slits in a double slit experimentation without being ejected and this poses interesting prospect for further investigations.

- **Bohr’s model:** Quantization of the orbital paths within the MP field into 2D space is attained along inertia frames of BOs (Fig. 4). Because quantization epitomizes particle presence, the outgoing radiation translates to discrete energy forms, \( E = n h v \) for the wave function collapse. As a consequence, the electron is not expected to spiral inwards towards the nucleus with continual radiation at Planck’s scale. How conservation or symmetry is sustained is demonstrated in Fig. 3a. Because the orbital paths into 4D space-time are assumed to violate lightspeed due to time dilation, the 3D space modelling of the \( \Psi \) of hydrogen is attained at a point into space-time. Applying such intuitions, degenerate BOs can somehow relate to Zeeman effect and perhaps other odd spin types for rotating MP model into forward time and this warrants further investigations.

- **Schrödinger Equation:** According to Fig. 4, the position of the electron anywhere along the orbital paths into extra dimensions is defined by the \( \Psi \) or \( i \hbar \) as mentioned above. Shifts in its position are accommodated by the generalized equation, \( i \hbar \frac{\partial}{\partial t} \Psi = \hat{H} \Psi \) where \( \hat{H} \) is the Hamiltonian operator for both the kinetic and potential energies. The square root of -1 is given by \( i \) and this is incorporated into Euler’s formulation (Fig.4). Change in time due to precession shifts the position of the electron and hence \( \Psi \) along the BOs. Such intuitions can be further explored for Schrödinger’s equation types of both time dependence and time independence including its cat narrative of \( m_s \).
• **Electromagnetism:** Based on the conceptualization process (subsection 2.1), the spherical boundary of the MP model is defined by \( E \), while its quantization along BOs in degeneracy is of \( B \). This sustains conservation where a particle such as an electron in orbit identifies with a classical Maxwell point. Shifts in its position due to precession are incorporated into the relationship, \( \nabla \times E = -\partial B/\partial t \) with \( \nabla \) defined by the spacing of BOs into extra dimensions. Precession dictates time and this in turn influences the rotational of \( B \) for the BOs. Any interaction with external light on a straight path at a point, \( i\hbar \) generates electromagnetic field of standing waves (e.g., Equation 7). Similarly, external application of magnetic fields during compression of the MP model is expected to insinuate Casimir effect (Fig. 4) and this warrants further investigations.

• **A probable entanglement scenario:** Continual precession and gravitational time dilation insinuates violation of lightspeed along the orbital paths towards singularity. In this case, the BOs sustain light cones of \( \pm \frac{1}{2} m_s \) in superposition states (Fig. 1d) and these are attributed to translation of 4D space-time into 3D space at observation. Any linear coupling of a complementary pair of MP models or \( \pm \frac{1}{2} m_s \) is expected to produce qubits, 1, 0, −1. Whether the coupling process between complementary pairs of the models or photons can be attained in the absence of light as a transport medium into space poses an interesting prospect for quantum entanglement. Similarly, whether the information gained by the photon from its interaction with the electron is either conserved or destroyed through decoherence offers an interesting dilemma for further considerations.

• **Statistical mechanics:** The precession stages of the orbitals in unlimited configuration states per time are defined by \( \Omega \) in which the orbitals are in thermal equilibrium with the UMF (Fig. 3a and b). Quantization of the orbitals along BOs provides the microcanonical
ensemble for the entropy, $S$ in the form, $S = k \ln \Omega$. The Boltzmann constant, $k$ offers an approximate value to the distributions of both fermions and bosons along degenerate states of BOs into extra dimensions in randomness. This is confined to $N$-dimensions of Hilbert space where both matrix and algebraic relationships for Dirac-Fermion and Bose-Einstein can be pursued. Extension of the baryon octet shape (Fig. 1b) towards the center may further accommodate decuplet diagrams for quark distribution at a lower hierarchy of scales in a multiverse. Such explanations can be explored for the SM where quantum excitations of degenerate BOs may account for a plethora of particle types.

- **Further experimental pursuits:** In summary, the design of the MP model of a gyroscope prototype can be tested experimentally. The rotation of the model assumes a clock face, while the orbital structures precess in reversal mode due to gravity. Hence, an object in orbit is expected to mimic 4D space-time and its interaction with a light beam can be observed for a number of scenarios. 1) Lightspeed at less than the speed of the rotating gyroscope. 2) Lightspeed at almost equal to the gyroscope’s speed. 3) Lightspeed at faster than the gyroscope’s speed. Any successful outcomes of such undertakings could perhaps ascertain some of the quantum features described above and this warrants further investigations.

## 5.0 MP model versus General Relativity

Relativistic theories in physics form the cornerstone for cosmic observations. Einstein’s name is synonymous with their development and this involves more complex mathematical paths that are construed to generally comply with experimental findings. The huge amounts of data gathered
are plotted into graphs of 2D to 3D space-times or 1D to 3D spaces. But to somehow translate such information into a proper perspective of 4D space-time is still lacking. Even for QFT applications, abstract mathematical tools know no physical boundaries and the predictions of extra dimensions offered by theories such as string theories or loop quantum gravity remain unphysical and these are yet to be proven in current experimental undertakings [7, 15]. Without any way forward, this offers a stalemate of physics. One way to circumvent such an inevitable dilemma is to begin first from a probable 4D space-time scenario and then navigate towards incorporating existing knowledge in physics within this perspective. To the best of the author’s knowledge, such a path has never been attempted before in order to avoid being metaphysical. With the compatibility of the MP model into 4D space-time and its wider application to both quantum and classical physics demonstrated in the preceding sections, its applicability towards relativistic theories is further pursued in here. First a probable black hole scenario is assessed and this is followed by the applications of general relativity to the solar system. Other notable themes like the Big Bang and cosmic inflation are briefly outlined at the end of this presentation in order to pave a new research path for their future pursuits.

5.1 A black hole scenario

Without any forthcoming data observed directly from a black hole, its true nature remains concealed. At the moment, light interaction with the surrounding matter is indirectly applied to predict the probable nature of a black hole [18]. At the moment, this is one of the intensely researched topics that are currently being pursued by collaborations between countries of different continents. A feat never undertaken before where satellite discs at long distances are
positioned to synchronize with each other in a matter of seconds [19]. One of the most important aspects of the black hole is that it is the place where both classical and quantum mechanics come into foreplay [18]. But trying to elucidate this process towards a possible unification path in the absence of any direct observational data offers an enigma that continues to persist today.

In our universe, two populations of black holes are presumed to exist, each at the nucleus of every galaxy [20]. Those of stellar-mass with masses in the range of 5 to 30 solar masses and supermassive for masses in the range of $10^6$ to $10^{10}$ solar masses. Suppose a black hole exist as a probable quantum state of a galactic scale, its applicability to the MP model into 4D space-time of unidirectional is offered in Fig. 5. Rotation into forward time is defined by Kerr matrix

![Figure 5](image)

**Figure 5.** Application of the MP model to a black hole into 4D space-time of unidirectional. Its interaction with light travelling in a straight path is expected to vanish along the orbital paths. Light absorption is progressively slowed into extra dimensions (green dotted loops). Any decoherence (green wavelength) of minimal energy (gray area) beneath the event horizon (maroon circle) must first overcome coherent flow
(black wavelength) by external application of high energy waves. The outline of the MP field is given by the blue dotted shape for the simplest scenario (i.e., a hydrogen atom), while its multiples are comparable to a multielectron atom. Blue arrows = forward time and green arrows = shift in precession.

whereas the extra dimensions along inertia frames are related to Schwarzschild property. Any interaction with external light travelling in a straight path is intercepted by the orbital paths, while coherence is sustained beneath the event horizon. In the absence of matter, the emergence of the $\Psi$ would take infinite time to evolve (see Fig. 4). Thus, the initiation of the $\Psi$ from point $x \rightarrow \hat{x}$ between two orbital paths during precession becomes of gravitational time dilation in light years. Singularity is defined by the uncertainty principle, $\hbar/4\pi$ and this is not expected to be very dense matter contrary to current tenets. In this case, whether any outgoing radiation into 3D space-time could account for gravitational wave types noted for a binary black hole merger [19] offers interesting prospect for future studies.

Comparably, a person falling into the black hole may never get the chance to reach singularity if one’s body becomes elongated or ‘spaghettized’ along the orbital paths into extra dimensions of time infinite. Any outgoing information is limited to external application of high energy waves such as gamma rays to overcome the gravitational effect of time dilation unlike the microscale (e.g., Fig. 4). Similarly, the entanglement scenario of the light cones is extremely enlarged for a multiverse at a higher hierarchy of scales and this might be unavailable to observation for someone stationed on Earth. Such a case rules out any existence of firewall paradox. Similarly, if Hawking radiation mimes $\pm\hbar$ for the macroscale, its observation is limited to the emergence of the $\Psi$ described above. Applying such metaphors, the model’s applicability to the solar system is examined next followed by a probable Bang scenario towards the end.
5.2 The solar system in a multiverse

Based on the Nebular hypothesis, the solar system evolved from a cloud of dust and gases immediately after the Big Bang. Suppose the planetary bodies were formed within a UMF of the sun, a likely scenario is offered in Fig. 6. In this case, whether the stability of the solar system into space is sustained from interactions with others of similar type remains an open question not pursued here. Perhaps the solar system forms a MP field that is somehow in thermal equilibrium within its galactic system known as the Milky Way. Such proposition remains a possibility because gravitational time dilation due to gravity would spiral inwards towards the center into flat space – a scenario displayed by the Milky Way. Applying this intuition, the solar system is explored for the application of general relativity.

Figure 6. The application of the MP model to the solar system is comparable to a Rutherford planetary model. The orbitals are quantized along straight paths of BOs (dotted lines). Divergence of the electromagnetic radiation from the sun (red curves and arrows) sustains $\vec{I}$ in asymmetry for the MP field (black arrows). The boundary (pale orange circle) indicates conservation. Note, the planets are not plotted according to size or type.
Based on Kepler’s 2nd law, the area covered by apsidal precession of a planet’s orbit is equivalent to its perihelion precession within the vicinity of the sun. In 3D space, the orbit is envisioned to be of an elliptic plane (Fig. 6), while precession insinuates a 4D space-time in flat space (Fig. 7). Because of gravitation time dilation, the extent of the orbital structures might not be fully observable to an external observer on Earth (e.g., Fig. 3b). For a literal application of the MP model to general relativity, Einstein’s field equation of geometry for the geodesic motion [10] is physically incorporated [Fig. 7]. Because the initiation of the planetary $\Psi$ of the geodesic

![Figure 7](image)

**Figure 7.** The application of Einstein’s field equation for the geodesic motion of a planet into 4D space-time. The initiation of the planetary $\Psi$ (yellow curve) is naturally incorporated into the geodesic motion but is of gravitational time dilation (i.e., readily unavailable to observations at lightspeed). The process normalizes the precession stages (orange dotted loop) of a MP field (blue dotted outline) and this sustains conservation. Manifolds of the stress-energy tensor ($T_{u,v}$) framework is assumed into extra dimensions comparable to BOs at the microscale (see Fig. 1d). The actual precession of the planet (e.g.,
Mercury) due to gravitational effect is provided in Fig. 3b. \( G = \) Newtonian gravity, \( R = \) scalar curvature and \( R_{g_{u,v}} = \) Ricci curvature tensor with definitions of other terms provided in the text.

Motion into forward time is considerably delayed by gravity, \( A \) equates to both the cosmological constant and Einstein’s original interpretation [10] of it representing the repulsion force for a static universe to balance out any gravitational pull. The term, \( T_{u,v} \), corresponds to inertia frame of BO in degeneracy for the macroscale (see Fig. 1c) where relativistic features of \( E = mc^2 \) and the equivalence principle are incorporated. In this way, light paths traversing BOs into extra dimensions provide metric tensor, \( g_{u,v} \), into space-time. But these are camouflaged to observations towards a lower hierarchy in the absence of matter interacting with the light waves. The core principle of general relativity in terms of how space tells matter how to move is accorded to precession of the MP model into forward time. Similarly, precession of the internal orbital structures into time reversal due to gravity (i.e., time dilation) tells space how to curve (Fig. 7). The process is perhaps replicated for Earth miming a MP model at the lower hierarchy of scale with its satellites in orbit comparable to the microscale (e.g., Fig. 3a and b). Applying such intuitions, the possible link between the microscale and the macro level is plotted next.

### 5.3 A probable reconciliation path

Pictorially, the MP model offers a tangible path towards the reconciliation process of quantum mechanics and general relativity based on the depiction of the \( \Psi \) into 4D space-time (e.g., Fig. 4 and 7). Such a path is extremely difficult to plot using conventional methods because of the restrictions imposed by the Occam’s razor based on the instrumentation capabilities and
theoretical approaches of applying abstract mathematical formulations. For a crude mathematical representation, Equation 2 is expanded into the form

\[ i \int_{-\infty}^{\infty} (dRdTd\Lambda)_{u,v} \equiv i \int_{-\infty}^{\infty} (d\Omega d\phi d\theta)_{u,v} \]  \hspace{1cm} (8)

where \( i \) refers to an accelerating object in orbit at an undefinable scale (\( \infty \)) of a MP model in accordance with Euler’s formulation (Fig. 4). The momentum of the object in both forward and reversible directions is of equal magnitude along the quantized states of BOs. From the geometry relationship of the proposed model, Equation 8 provides the link between the microscale and the cosmic level. By expanding Equation 6, the planetary \( \Psi \) is given by the expression

\[ T_{u,v} \int_{-\infty}^{\infty} \left( R_{u,v} + A g_{u,v} + \frac{1}{2} R g_{u,v} \right) \frac{8\pi G}{C^4} dR_{u,v} \equiv n I_{\|}(u,v) \int_{-\infty}^{\infty} \Psi \cdot \Psi \, d\tau_{u,v} . \]  \hspace{1cm} (9)

The left side of Equation 9 relates the geodesic motion to the \( \Psi \) (Fig. 7). This is of gravitational time dilation with its magnitude defined by, \( \frac{8\pi G}{C^4} \) for the localization of gravity within the orbital paths (i.e., matter curves space-time). For instance, Mercury’s perihelion precession of its elliptic orbit advances by 5,601 seconds of arc per century [13] for a body of a mass equal to \( 3.285 \times 10^{23} \) kg. Suppose the formation of the arc or geodesic motion equates to the approximate time it takes for the emergence of a \( \Psi \), this is attained at a rate of 56 seconds per year. Thus, for observational purposes, a time machine is required to wind back the clock in order to register the
complete $\Psi$ that evolved over the past centuries towards the present stage. Unfortunately, there is no such instrumentation that is capable of achieving such a feat into forward time.

The above interpretation appears somewhat contrary to the prediction offered by quantum mechanics. For example, De Broglie relationship, $\lambda = \frac{h}{mv}$ for classical objects considers the $\lambda$ in relation to the $\Psi$ to be negligibly small as mass becomes larger. As a consequence, the reconciliation path for quantum mechanics and general relativity using conventional methods has become fairly constrained with infinite mathematical terms. For this study, $\pm h$ is projected outward towards the boundary of the MP field of time invariance and this sustains $\vec{I}$ in asymmetry (Fig. 1d). In this case, the uncertainty in the position of an object into space-time is defined by the relationship

$$(G\mathcal{H} - mc)_{u,v} \cong (ih - mc)_{u,v} \quad (10)$$

where $\mathcal{H}$ equates to a minimal energy level of the MP model akin to $\hbar$ for the microscale. Any outgoing radiation towards the outer space in accordance with the 2$^{nd}$ law of thermodynamics is attained at lightspeed for mass-energy equivalence, i.e., $-mc$ (Equation 10). For localized gravity, Equation 10 is reduced into the form

$$G\mathcal{H}_{u,v} \equiv i\hbar_{u,v} \quad (11)$$

Equation 11 defines singularity for a multiverse at a hierarchy of scales into space-time. For the microscale, singularity at minimal energy level is represented by $i\hbar$ (Fig. 4) and somehow this is expected to translate towards a higher hierarchy of scales. Because the inertia frames of BOs
sustain the relativistic principles of $E = mc^2$ and the equivalence principle as mentioned earlier, the structural frames of the MP models remain unobservable. Shift in the position of matter between orbital paths, i.e., $x \rightarrow \hat{x}$ at a minimal precession stage is attained in accordance with the first principle of quantum mechanics (see also Fig. 4). Perhaps, for a multiverse within a visible universe, its outermost limit is defined by the cosmic microwave background (CMB) of a MP field type. How these all fit into a probable Big Bang scenario is plotted next.

5.4 Other related cosmic themes

Based on the alternative version of general relativity offered above, dark matter and dark energy are somewhat intuitively incorporated within the extra dimensions of a multiverse at a hierarchy of scales. How the Big Bang and the accelerated cosmic inflation fit into such perspective is briefly outlined here in bullet points.

- **A probable Big Bang scenario**: The conceptualized UMF (Fig. 1b) is figurative of the $M$-theory type and this somewhat incorporates $SO(10)$ of multidimensional structures (Fig. 8a and b). The resemblance of MP field to Higgs mechanism of unidirectional is applicable to time reversal symmetry breaking due to Planck’s radiations. This counters time reversal induced by gravity. Suppose the Big Bang evolved from a primordial soup in uniformity (Fig. 8a), its progression towards the lower hierarchy of scales ensues in the following manner: $SO(10) \rightarrow SU(5) \rightarrow SU(3) \times SU(2) \times U(1)$. The final stage is of the gauge symmetry for the atomic scale [6] and other intermediate steps can be incorporated between these three stages. For the visible universe defined by the CMB of a MP field type (Fig. 8a and b), a literal Wheeler-Feynman one-electron-universe [21] becomes
Figure 8. An idealized scenario of the Big Bang into 4D space-time of unidirectional. (a) Time reversal symmetry due to gravity effect is broken during the Big Bang from an initial state of uniformity. Cooling and regression towards the center insinuates the emergence of multidimensional structures in thermal equilibrium to the initial state. Each subsequent dimension sets the stage for the evolution of bodies such as galaxy, star, planet and the atom and its constituents. (b) The MP model of each body type into space emerges in thermal equilibrium to the CMB. The body evolves when matter collides and amalgamates along orbital paths into extra dimensions of a multiverse. The emergence of localized model at any of the dimensions and devoid of matter may insinuate black holes (e.g., Fig. 5) inclusive of the subatomic level.

In such demonstration, how matter and time originated including whether there exists other multiverses beyond the one defined by the CMB appear to be philosophical questions that are not explored in here. In the initial stage of 4D space-time following the Big Bang, the photons assumed the inertia frames of BOs and this sustains $E = mc^2$ and the equivalence principle thereafter (Fig. 8a). In this case, it becomes
difficult to distinguish the structural frames of the MP models at observations without any light-matter interactions. At the microscale, the photons are replaced by neutrinos as outcomes of virtual particles or interactions of BOs (e.g., Fig. 1d) and subsequently quarks for the subatomic level in a multiverse. These intuitions if considered could perhaps account for why ordinary matter constitutes only 5% of the visible universe compared to 25% of dark matter and 70% of dark energy. For example, suppose dark matter relates to quantized states of BOs of extra dimensions in a multiverse, this can somehow relate to weakly interacting massive particles [22] at a higher hierarchy of scales. Dark energy is then attained by precession of the orbital paths into 4D space-time within the CMB. How these all fits into the cosmic inflation is presented next.

- **A cosmic inflation scenario:** Suppose an observer on Earth is aligned within the area defined by the CMB (Fig. 8a), away from it, the stars and galaxies would appear to undergo accelerated expansion at more than lightspeed into either 2D or 3D space-times. Such a scenario can be assumed if Earth and possibly the solar system are accelerating along inertia frames of the orbital paths into 4D space-time. Because of gravitational time dilation, the emergence of the $\Psi$ is impeded so that constant light paths are expected to be considerably redshifted during observations unlike the atomic state. Depending on the scale, the time frames can be of light years for continual precession into forward time.

Thus, in 2D space-time, the redshift is defined by the generalized form, $z = \frac{\lambda - \lambda_0}{\lambda_0} \propto d$

with $\lambda$ as the measured wavelength shift, $\lambda_0$ is the reference wavelength and $d$ is the measured distance. In this case, blueshifts are fairly constrained in accordance with the Hubble constant. This is one way of avoiding negative vacuum of antimatter.
Further experimental pursuits: The explanations offered above though are highly speculative, they somehow provide an alternative version to the development of the cosmic universe defined by the CMB into 4D space-time since the Big Bang (Fig. 8a). Thus, comparable to the propositions offered for the microscale for further pursuits, similar approach should be considered for the macroscale within the broad areas of cosmology and astrophysics. In this case, the external light beam is expected to be less than the area of the object enclosed within a gyroscope of a MP model for a number of scenarios. a) Lightspeed at less than the gyroscope speed, b) lightspeed equal to the gyroscope speed and c) lightspeed at more than the gyroscope speed. Precession of the orbital paths within the MP field assume time reversal mode compared to forward motion of the gyroscope of a clock face. Such undertakings should also incorporate the black hole scenario (Fig. 5) and the geodesic motion of a planet in orbit of the sun (Fig. 7). Any successful outcomes are expected to ascertain the model’s applicability to existing knowledge in physics as demonstrated in this section.

6.0 Concluding remarks

The proposed MP model into 4D space-time and its application to physics in general provides one tangible path towards the reconciliation process of quantum mechanics and general relativity. Such a path is difficult to demonstrate based on Occam’s razor for current experimental and theoretical pursuits are confined to either 2D to 3D space-times or 1D to 3D spaces. For this undertaking, a multiverse is assumed at a hierarchy of scales within the limits of the visible universe defined by the CMB. Newtonian gravity is then considered localized to a
body into space. The quantized inertia frames of BOs of the MP model sustain relativistic features of $E = mc^2$ and the equivalence principle. Thus, the structural frames of rotating MP models into forward time at lightspeed are indistinguishable to observations. Such intuitions somewhat appear highly speculative, but the model is developed and applied in accordance with existing knowledge in physics and our general perceptions of the physical world. If considered, it offers a valuable intuitive tool to complement conventional methods, especially when attempting to integrate and consolidate many aspects of foundation physics into proper perspective of 4D space-time for both the microscale and the cosmic level. This may provide the needed incentives to explore physics further into the unknown realms using conventional methods, perhaps in incremental steps and this warrants further investigations.

Competing financial interests

The author declares no competing financial interests.

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Figure 1

A simplified flow diagram demonstrating the gap in conventional methods towards the unification process of quantum mechanics and general relativity.
A step-by-step conceptualization path of the MP model. (a) Expansion of electron-wave diffraction from an electron source in a single slit setup towards detectors A and B. (b) In asymmetry is incorporated by the UMF (green loop) and this includes the emergence of a MP field (gray area) into 3D space. An octet shape of inertia frames is enclosed within a circular E. Coherence is epitomized by the wavelength, $\lambda$ for conservationism. (c) Emergence of orbital structures within the MP mimes the UMF background in thermal equilibrium. These are quantized along BOs of B in degeneracy into extra dimensions, ni. (d) The MP field of 3D space is transformed into 4D space-time of unidirectional in flat space. A particle (green circle) in motion such as an electron along orbital paths (pink dotted lines) is quantized via BOs in
Degeneracy. Miniature wave function, $\psi$ (blue wavy curve) of gravitational type below Planck’s scale traverses the orbital paths. The electron transition between two orbitals from point $\bullet$ (pink area) due to precession equates to $\pm h$ for the MP field (white area). This is bounded by unidirectional $\phi$ (green wavy loop) in equilibrium to $\varphi$ (blue arrows) in asymmetry. Expulsion of $h$ during observation unveils superposition of $\pm 1/2$ magnetic spin (ms) along quantized states of BOs (navy colored cones). The scenario is attributed to the effects of gravitational time dilation where external light paths along BOs spiral inwards towards the center. Hence, the orbitals are somewhat precessing in time reversal to forward motion of the UMF (green arrows). All these descriptions allude to the dynamics of a MP model of a spherical electron cloud model (gray area) into 4D space-time in flat space.

**Figure 3**

An MP field of elliptic shape. The sphere along the z-axis/$\bullet$ is comparable to a BO, while the x-axis identifies $\circ$ in asymmetry. If z-axis mimes B, y-axis equates to E.
Observation of actual orbital paths during precession violates lightspeed due to localization of gravity. Thus, a particle extracted in an upward direction at position 1 (a) offers +1/2 spin into forward time (blue dotted curve and arrow) and vice versa in a downward direction at position 2 (brown dotted curve and arrow). The former is attributed to precession of UMF into forward time and the latter to internal orbital structures undergoing gravitational time dilation. In this way, the quantized states of BOs sustain superposition of ±1/2 ms into extra dimensions. (b) Similar process is perhaps applicable at a higher hierarchy of scale for Mercury’s orbit [16]. Shifts in the perihelion precessions due to gravity are more accessible to an external observer on Earth unlike the microscale. X+ represent matter (e.g., Mercury) into forward time and X- is the apparent position for the antimatter field owed to the effect of gravitational time dilation. The former is not drawn according to spatial distance. \( \tilde{\kappa} \) = number of configurations for the orbital undergoing gravitational time dilation, \( \omega \) = perturbation of angular velocity and \( \varphi \) = is the measure of magnetic flux or BOs into extra dimensions between two MP fields.
Figure 5

The presence of matter within the MP model insinuates a wave function, $\Psi$, into 4D space-time. This is reduced to either 2D or 3D space at a point in time during observation (i.e., a wave function collapse scenario). How some of the major physics themes fits into this conceptualized process are incorporated and expounded further in the text.
Figure 6

Application of the MP model to a black hole into 4D space-time of unidirectional. Its interaction with light travelling in a straight path is expected to vanish along the orbital paths. Light absorption is progressively slowed into extra dimensions (green dotted loops). Any decoherence (green wavelength) of minimal energy (gray area) beneath the event horizon (maroon circle) must first overcome coherent flow (black wavelength) by external application of high energy waves. The outline of the MP field is given by the blue dotted shape for the simplest scenario (i.e., a hydrogen atom), while its multiples are comparable to a multielectron atom. Blue arrows = forward time and green arrows = shift in precession.
Figure 7

The application of the MP model to the solar system is comparable to a Rutherford planetary model. The orbitals are quantized along straight paths of BOs (dotted lines). Divergence of the electromagnetic radiation from the sun (red curves and arrows) sustains in asymmetry for the MP field (black arrows). The boundary (pale orange circle) indicates conservation. Note, the planets are not plotted according to size or type.

Figure 8

The application of Einstein’s field equation for the geodesic motion of a planet into 4D space-time. The initiation of the planetary (yellow curve) is naturally incorporated into the geodesic motion but is of gravitational time dilation (i.e., readily unavailable to observations at lightspeed). The process normalizes the precession stages (orange dotted loop) of a MP field (blue dotted outline) and this sustains conservation. Manifolds of the stress-energy tensor framework is assumed into extra dimensions comparable to BOs at the microscale (see Fig. 1d). The actual precession of the planet (e.g., Mercury) due to gravitational effect is provided in Fig. 3b. G = Newtonian gravity, R = scalar curvature and Rgu,v = Ricci curvature tensor with definitions of other terms provided in the text.
An idealized scenario of the Big Bang into 4D space-time of unidirectional. (a) Time reversal symmetry due to gravity effect is broken during the Big Bang from an initial state of uniformity. Cooling and regression towards the center insinuates the emergence of multidimensional structures in thermal equilibrium to the initial state. Each subsequent dimension sets the stage for the evolution of bodies such as galaxy, star, planet and the atom and its constituents. (b) The MP model of each body type into space emerges in thermal equilibrium to the CMB. The body evolves when matter collides and amalgamates along orbital paths into extra dimensions of a multiverse. The emergence of localized model at any of the dimensions and devoid of matter may insinuate black holes (e.g., Fig. 5) inclusive of the subatomic level.