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Theory of Spheres ('Quantum Gravity')

or

Empty Spheres in 'Dimensionless Space' – The 'Fundamental Force' Behind Everything

(Quantum–Gravitational Force, 'Dark Matter' / 'Dark Energy', etc.)

Paper X (Appendix of Paper IX): M^{l}_{D0} – The Quantum 0-D Light-Mass and m_p (Planck mass)

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ABSTRACT

In Paper IX, we successfully derived the total cosmic **0-D light-mass**, achieving one of the primary foundational goals of the **Theory of Spheres (ToS)**. Seeking to extend Paper VIII toward the derivation of electroweak boson masses **($W^{\pm}$, Z^0)** using methods analogous to Paper **IV** - where Planck's constant was derived via the universal cosmic constant (**$\Lambda \approx 1.44 \times 10^{-122}$**) acting as both the vacuum catastrophe and a classical-quantum bridge - an unexpected numerical result emerged. The calculated value matched the historical Planck mass **(m_p)** with remarkable precision. This implies that the Planck mass - whose true physical nature remained elusive to Max Planck himself and subsequent generations - is fundamentally the **quantum baryonic Mass or ($\sqrt{3}$ × Quantum 0-D Light-Mass),** evaluated at the quantum scale.
Finally, we conclude in a perfect closure by realizing that the square root of the cosmological constant ($\sqrt{\Lambda}$) serves as the cosmic-quantum connection coefficient between the **0-D light-mass** viewed from cosmic and quantum perspectives. Consequently, it also acts as the hierarchical connection coefficient to the 0-D mass across an almost infinite chain of universes (parent and sub-universes).

Part A: Introduction

This appendix reviews the derivation of the **quantum baryonic Mass** and the **Quantum 0-D Light-Mass** from the **0-D harmonic oscillator engine** at the quantum scale, exploring its deep physical implications, with a particular focus on the profound impact of this relationship, regarding the position of our universe within a potentially infinite hierarchy of parent and sub-universes.

Chapter 1: From Cosmic Scaling to Quantum Phase Mass (m_p) - The Mathematical Derivation

When analyzing the macroscopic-to-quantum transition, we utilize the observable baryonic mass of our universe **($M_{baryonic} = 1.54 \times 10^{53}$kg**, as derived in Paper IX**)** and using the square root of the dimensionless cosmic scaling constant **($\sqrt{D_0}$) ≈ 1.2×10^{-61}, derived from $D_0 \approx 1.44 \times 10^{-122}$)** (Paper II):

$$M_{\mathbf{baryonic}} \times \sqrt{\mathrm{D}_0} = 1.54 \times 10^{53}{}_{\mathrm{kg}} \times 1.2 \times 10^{-61} \approx 1.848 \times 10^{-8}{}_{\mathrm{kg}}$$

Note: In this Appendix, from this point forward, to distinguish between macroscopic-cosmic and microscopic-quantum perspectives, the relevant mass variables are designated accordingly: **$M_{baryonic}$** and **M^{I}_{D0}**, as along the series, denote the cosmic baryonic mass and total cosmic **0-D light-mass**, respectively, while **$M_{b(qua)}$** and **$M^{I}_{D0(qua)}$** denote their corresponding quantum-scale.

To transition accurately back from 3-D macroscopic space into the pure **0-D dimensionless** state, we apply the inverse spatial projection factor, reversing the 3-D isotropic equipartition from **X, Y, Z** back to the 0-D phase quantum established in Paper IX. Therefore, the reverse transition from the observed space back to the 0-D phase requires **multiplication** by $\sqrt{3}$ (since the forward projection required division by $\sqrt{3}$): **$M^{I}_{D0(qua)} = M_{b(qua)} \times \sqrt{3} = 1.848 \times 10^{-8}_{kg} \times \sqrt{3} \approx \underline{3.2 \times 10^{-8}_{kg}}$**.

(Note: Unlike in Paper **IX**, no inverse 4-quarter scaling is required here, as the 0-D quantum phase represents a fundamental pulse unit evaluated externally to the 4-quarter geometry)

Comparing this derived value - **$M^{I}_{D0(qua)} \approx 1.848 \times 10^{-8}_{kg}$** - to the officially measured Planck mass **($\underline{m_p \approx 2.176 \times 10^{-8}_{kg}}$) ($\Rightarrow m_p \approx M_{b(qua)} = M^{I}_{D0(qua)} / \sqrt{3}$ -** as derived here and applied hereafter), leads to a minor deviation of **about 15%** to **17%**. The deviation primarily attributed to rounding results along the way and to standard, mainly cosmological, approximations used throughout the series - **such as**: the age of the universe, its mass and its radius. Undoubtedly, the major factor is attributed to the constant speed of light used by traditional physics.

Examples of such deviations accumulated along the series include: the calculations of the Hubble parameter and the cosmological constants **(H_0, Λ)** in Paper II, the Coupling Constant (**α -** denoted as **α_s** later in Paper VII**)** in paper III(a), Planck's constant - $\hbar$ in paper IV, as well as external and internal structural coupling constants **(α_s and β_s)**, and Gravitational Constant **$G_{0(now)}$**) in Paper VI. Even subtle, careful discrepancies appear in the lepton masses calculated in Paper VII.

Note: Unquestionably, these variations - along with other parameters such as the Maximum Speed of Light **(C_{max})**, the Universe Lifespan **(t_{max})**, time-dependent Gravitational Constant **($G_{0(t)}$)**, and others, which offer no direct parallel for comparison in standard physics - stem directly from the rounding results, approximations used throughout the series, and primarily the constraint of a constant speed of light used in traditional physics.

The Unified Quantum-Cosmic Identity

To reveal the exact deterministic mechanism underneath this numerical correlation, we cross-reference these boundary conditions with the four-quarter cosmic topology established in Paper IX (P. 3). In our framework, the cosmos consists of four symmetric entangled quarters (4**π** topology), where our observable universe constitutes a single quarter (25% baryonic matter):

$$M_{\text{baryonic}} = \frac{\mathbf{M_{obs-total-oscillator}}}{\mathbf{4}} = \frac{\mathbf{M^{l}_{D0}}/\sqrt{3}}{4} = \frac{\mathbf{M^{l}_{D0}}}{4 \times \sqrt{3}}$$

(where $\mathbf{M^{l}_{D0}}$ is the accumulated potential of the total cosmic 0-D oscillator light-mass)

By substituting this geometric definition into our initial macroscopic-to-quantum transition, we obtain:

$$M_{\text{baryonic}} \times \sqrt{\mathrm{D}_0} = \frac{\mathbf{M^{l}_{D0}} \times \sqrt{\mathrm{D}_0}}{4 \times \sqrt{3}}$$

Concurrently, our direct quantum-scale extraction establishes that:

$$M_{\text{b(qua)}} \times \sqrt{\mathrm{D}_0} = M_{\text{b(qua)}} \times \mathbf{1.2} \times \mathbf{10^{-61}} \approx 1.848 \times 10^{-8}\,\text{kg} = \frac{\boldsymbol{M^{l}_{D0(qua)}}}{\sqrt{3}}$$

Equating the two expressions yields the final structural relationship:

$$\frac{\mathbf{M^{l}_{D0}} \times \sqrt{\mathbf{D_0}}}{\mathbf{4} \times \sqrt{\mathbf{3}}} = \frac{\boldsymbol{M^{l}_{D0(qua)}}}{\sqrt{\mathbf{3}}}$$

Chapter 2: Chain Hierarchy Universes - Key Implications

Since the 3-D spatial projection factor **($\sqrt{3}$)** appears identically in the denominators of both sides of the preceding equation, it naturally cancels out. This elegant cancellation proves that the isotropic spatial dimensions clear away when isolating the foundational 0-D energy unit. Finally, by isolating and substituting the cosmic scaling constant **($\sqrt{D_0}$)** with the universal cosmological constant scale **($\sqrt{\Lambda}$-** Paper II, Chapter 4. Equation 23**)** and returning to **M^l_{D0}** as a general **0-D harmonic oscillator mass engine**, we unlock the exact, deterministic bridge:

$$M^l_{D0(qua)} = \frac{M^l_{D0} \times \sqrt{\Lambda}}{4} \quad \text{In general form} \Rightarrow \quad M^l_{D0(Sub-Universe)} = \frac{M^l_{D0} \times \sqrt{\Lambda}}{4} \quad \text{and} \Rightarrow \quad M^l_{D0(Parent-Universe)} = \frac{M^l_{D0}}{\sqrt{\Lambda}}$$

Note: In extension to the note in Chapter 1, factor **4** depends strictly on the observer's perspective. When observing downward from our cosmic quarter toward the quantum scale (or sub-universes), we perceive the entire **0-D oscillator** from within a single quadrant, hence the asymmetric factor **4** remains. Conversely, when observing upward, we perceive only **1/4** of the parent universe; therefore, the factor of **4** appears on both sides of the equation and naturally cancels out.

Physical Meanings:

- The historical formulation of Planck mass in 1899 combined **G**, **ħ**, and **c** ($m_P = \sqrt{\hbar c/G}$) into a dimensional unit without a mechanistic blueprint. Whereas, within the Theory of Spheres, **m_p** is revealed not as an arbitrary spacetime boundary or quantum uncertainty cutoff, but as the **quantum baryonic Mass** or **$\sqrt{3}$ × Single 0-D Quantum Phase Mass** - the fundamental energetic unit of the pure **0-D light engine**.
- The dimensionless ratio **($D_0 = \Lambda \sim (m_p/M_{baryonic})^2 \sim 1.44 \times 10^{-122}$)** hermetically binds the micro - quantum scale to the macro-cosmic horizon.
- Particle accelerators **(such as the LHC)** measure only transient excitation states operating entirely within the **3-D spatial domain** - probing secondary harmonics and transient fluctuations **(such as $W^{\pm}$ and Z^0 bosons** at masses of **~ 80--91 GeV)** without ever penetrating or altering the pure **0-D phase quantum** itself **($m_p = 2.176 \times 10^{-8}$kg ≈ 1.22×10^{19} GeV)**.
- At the subatomic scale, **$\sqrt{3}$ × Planck mass** acts as a 0-D phase pulse projecting the particle spectrum, mirroring the cosmic mass (M^l_{D0}) across the universe hierarchy.
- **Chain hierarchy example**: A foundational 0-D engine situated in the parent of our universe projects through a scaling factor of **($1/\sqrt{\Lambda}$) × the 0-D light-mass**. This mechanism operates alongside a nearly infinite network of co-existing **0-D engines**. Concurrently, a corresponding nearly infinite number of sub-engines extends downward, into sub-universes scaling sequentially by the same characteristic mass factor. These **0-D engines** project the fundamental **lepton spectrum**, establishing the framework for all localized physical laws. Within this cosmic hierarchy, the foundational particles structuring both parent and sub-universes directly correspond to known leptons, while our universe functions as a symmetric mirror projection, fundamentally behaving like a positron within its macrocosmic parent universe.

- By canceling 3D spatial projection factors, the exact relationship **($\sqrt{3}$ × m_p ≈ $M^{l}_{D0(qua)}$ = (M^{l}_{D0} × $\sqrt{\Lambda}$) / 4))** - regarding factor **4**, see Note above - reveals a pure **0-D structural law** that enables complete deterministic mapping of physical constants, mass spectra, and fundamental parameters across the entire hierarchy of parent and sub-universes without spatial motion. (Note: Replacing Paper I, Chapter 9's initial estimate of ~70 orders of magnitude between adjacent hierarchy universes, the exact derivation here fixes the scale at $\sqrt{\Lambda}$ ≈ **1.2×10^{-61}** orders).

Conclusion

This appendix bridges the foundational 1899 physics of Max Planck with the modern framework of the **Theory of Spheres**. By identifying the Planck mass as the quantum manifestation of the **quantum baryonic Mass,** related to the **quantum 0-D light engine** by a factor of $\sqrt{3}$, we eliminate the traditional mystery surrounding the **Planck scale**. Furthermore, the exact derivation reveals that this fundamental mass unit of the **0-D oscillator framework** is inextricably bound to the four-quarter cosmic topology and the vacuum scale ($\sqrt{\Lambda}$ - cosmological constant root), establishing a precise, deterministic bridge that maps physical constants and mass spectra across the entire hierarchy of parent and sub-universes without spatial motion.

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