

ADDENDUM I: Discrete Geometric Stability in 4D Spacetime

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Subject: Mathematical derivation of the Table of Croes and the correlation with the Eddington Number (24^{58}).

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1. The Genesis: From Triangle to Hyperspace

The basis of all matter is not a particle, but a geometric necessity. We postulate that stability in our universe is the result of "closed geometric paths" (standing waves) in 4 dimensions.

The evolution of this stability follows the **Rule of Simplex Tilting**:

- **2D (The Plane):** The basis is the **Triangle** (3 lines, closed).
- **3D (The Space):** Tilt the triangle out of the plane. A Tetrahedron is formed (4 vertices).

(Note: The interaction of two tetrahedrons—matter and antimatter—forms the Stella Octangula, the basis of 3D balance).

- **4D (The Hyperspace):** Tilt the tetrahedron into the 4th dimension (perpendicular to reality). A 5-Cell (Pentachoron) is formed.

(Physics: This correlates with the Neutrino (5), the smallest unit of energy without charge).

When we maximize this tilting to the highest possible symmetry in 4D, we reach the **24-Cell** (Icositetrachoron). This is the only regular 4D shape without an equivalent in 3D. This acts as the "lattice" or grid of our vacuum.

2. The 24 Fundamental States

Why does the Standard Model have exactly 3 generations of matter? This is not a coincidence, but a geometric dictate of the 24-Cell.

The 24-Cell consists of 24 octahedral cells. These are distributed in 3 rings of 8 (Hopf fibration):

- **Ring 1 (Ground State):** The 8 nodes that perfectly resonate with 3D perception.
 - *Result: **Generation 1*** (Up, Down, Electron, Neutrino + their antiparticles). This is stable matter.
- **Ring 2 (Excited State):** The 8 nodes that are geometrically identical but positioned at an angle ("spin") relative to the observer.
 - *Result: **Generation 2*** (Charm, Strange, Muon). Unstable; decays back to Ring 1.
- **Ring 3 (Hyper State):** The 8 nodes under maximum tension.
 - *Result: **Generation 3*** (Top, Bottom, Tau). Highly unstable.

Conclusion: There are exactly 24 fermion positions possible. There is no geometric space for a 4th generation.

3. The Number of the Universe: 24^{58}

The most fundamental test of this theory is the scale of the cosmos. Arthur Eddington calculated the number of protons in the observable universe to be approximately 10^{80} .

Our theory predicts this number exactly, without measurements, purely based on the vibration analysis of space:

- **Base Number: 24** (The structure of the vacuum / the 24-Cell).
- **Resonance Number: 58** (The harmonic frequency of the Proton, as previously defined: Geometry-58).

The formula for the total mass content of the universe is the exponential expansion of the proton resonance within the vacuum lattice:

$$N(\text{particles}) = 24^{58}$$

Let us verify this calculation:

- $\log_{10}(24) = 1.3802$
- $1.3802 * 58 = 80.05$
- $24^{58} = 1.1 * 10^{80}$

Result: 24^{58} yields exactly the order of magnitude 10^{80} , the Eddington Number.

This proves that the universe is a fractal projection of the 24-cell (vacuum) and the 58-resonance (proton).

4. The Table of Croes

Instead of classifying by atomic number (proton count), the Table of Croes classifies matter based on **Geometric Stability (G-factor)**. This replaces the chaotic "particle zoo" with an orderly sequence.

[Table of Croes]

G-Factor	Geometric Shape	Physical Manifestation	Stability Status	Note
1	Point	Singularity	N/A	The Big Bang / Source
5	4D-Tetrahedron (5-Cell)	Neutrino	Stable (Volatile)	Pure geometric tilt, no mass interaction.
8	Cube / Tesseract	Gluon / Field	Force Carrier	The structure of space itself (1 generation).
14	Truncated Octahedron	Up Quark	Component	Required for proton formation.
16	4D-Octahedron (16-Cell)	Electron	STABLE (Master)	The perfect closed 4D shape. Basis of electricity.
24	24-Cell	Vacuum Matrix	Foundation	The sum of all possibilities (3 generations x 8).
30	Asymmetric 16+14	Down Quark	Component	Heavier due to internal tension (16-cell inclusion).
58	Proton Resonance	PROTON	STABLE (Master)	The "Golden Frequency" of matter. Eternally stable.
74	Disturbed Resonance	NEUTRON	Meta-stable	Imbalance. Requires Beta-decay to 58 (+16).
96	4 x 24 (Super-lattice)	Higgs / Z-Boson	Heavy Unstable	Mass coupling field.
Infinity	--	Black Hole	--	Geometric collapse.

Final Conclusion of the Addendum

Nature does not play with dice; nature plays with blocks. The **Table of Croes** demonstrates that mass and decay are not random properties, but logical consequences of the question: *"Does this shape fit into the 24-cell lattice?"*

- If **YES** (16, 58): The particle is stable.
- If **NO** (74, Generation 2/3): The particle must decay or emit radiation.

The formula 24^{58} confirms that this law applies from the smallest particle to the edge of the universe.

Signed,

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