Potentum Physics 101 – The Geometry of Reality

From Schrödinger to Hestenes to Potentum

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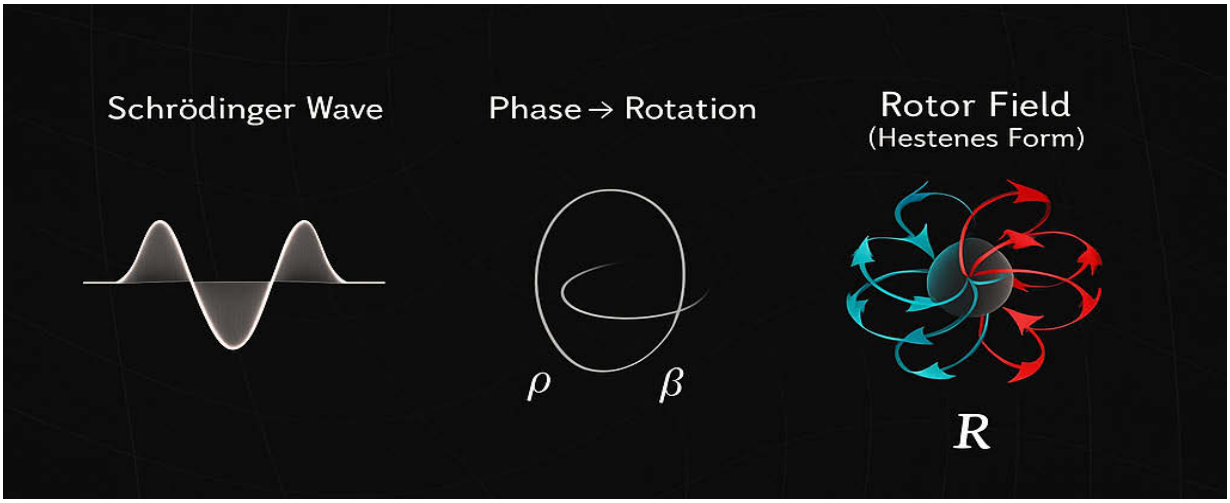
1. How Physics First Learned to See

Every student begins with symbols on a page: $F = ma$, $E = mc^2$, elegant, lifeless. For centuries, physics meant numbers—quantities detached from what they measured. Yet the world we inhabit is not made of numbers. It is made of *form*. Geometry moves, and that movement is what we call Nature.

The first revolution in seeing came with geometry itself: Euclid taught how space could be reasoned, Newton gave that space motion, Maxwell filled it with light. But each success deepened a blindness—equations were growing, intuition probing.

Geometric Algebra re-opens that sight. It is mathematics with shapes built in. Instead of placing coordinates on a blank page, we let the objects upon and the page itself bend, rotate, and converse. Numbers emerge from these shapes the way sound emerges from an instrument—as consequence, not assumption. This is the language in which the universe already thinks.



2. Schrödinger's Wave – The First Whisper of Geometry

In 1926, Erwin Schrödinger dared to replace Newton's point-particle with a wave. The electron, long imagined as a dot in space, became a field of probability—a rhythm of potentiality whose square gave the chance of finding it here or there:

$$i\hbar \frac{\partial \psi}{\partial t} = \left(-\frac{\hbar^2}{2m} \nabla^2 + V \right) \psi.$$

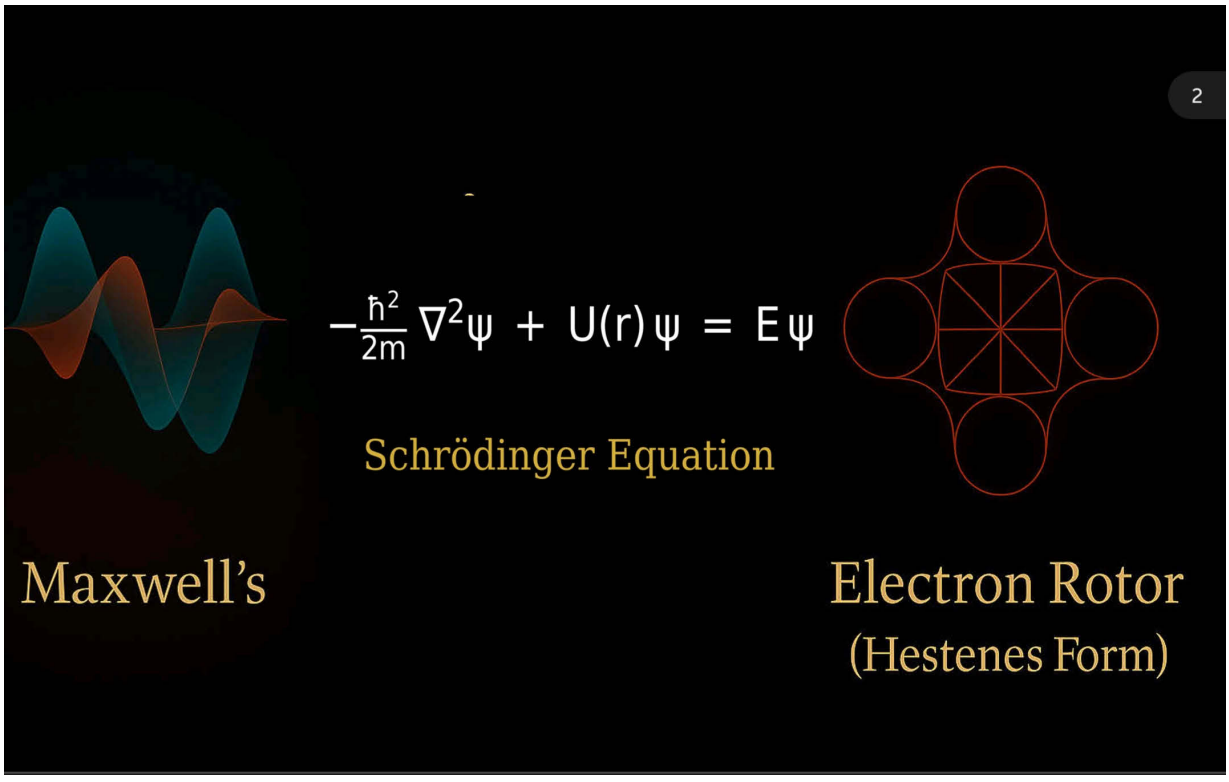
This simple line changed physics forever. Matter was no longer a bullet, but a melody. Energy and frequency were married.

Yet even this miracle spoke in abstractions. *What* was waving? A physical field? A probability? Something hidden? Schrödinger's own answer drifted; the geometry behind the wave remained unseen.

In Potentum form we write the same motion more honestly:

$$\psi = \rho^{1/2} e^{i\beta} R.$$

Here, R is a *rotor*—a literal orientation of space itself. ρ is density, β is internal phase. The wave is no ghost: it is geometry turning. What appears as an electron cloud is the visible trace of space in motion.



3. Hestenes and the Return of the Rotor

David Hestenes restored this lost geometry. He showed that the complex phase $e^{i\beta}$ in quantum theory is not symbolic; it is an *actual rotation* in spacetime. The Dirac equation, long wrapped in matrices, becomes a statement of pure geometry:

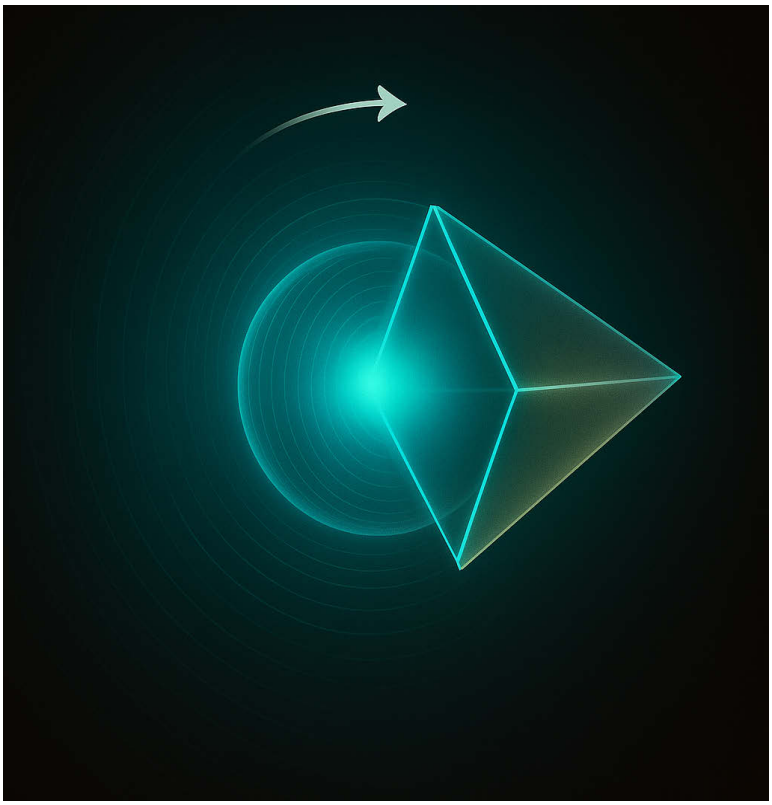
$$\nabla\psi\, i\sigma_3 = m\,\psi\,\gamma_0.$$

In Potentum notation, this condenses to the *reciprofluxive rotor law*:

$$\nabla R = i\,\Omega\, R.$$

Ω is the angular-flux d ensity—the local twisting of spacetime. Now mathematics *is* motion. In-stead of tracking a particle through coordinates, we track the turning of being itself.

From this foundation emerge two linked measures: the Compton frequency, $\nu_C = mc^2/h$, and the reduced Compton wavelength, $\bar{\lambda} = \bar{h}/(mc)$. Each particle carries both: one temporal, one spatial; a heartbeat and a stride. The ratio of these across the proton and electron is the key to the architecture of matter.



The Half-Octahedral Rotor Head

In full equilibrium, the electron's bivector of spin (its angular flux plane) traces a closed octahedral symmetry — six faces representing the dual orientations of three orthogonal spin axes.
But when that rotation advances through space — when it stops being a static spin and becomes a translation of spin — only one half of that octahedron remains open to the forward direction.

Thus, in this α-phase (the beginning of Senson formation):

The front half (outward-pointing pyramid) manifests as a dynamic cone of curvature.

The rear half collapses into the flux channel — it becomes the density wave that trails the rotor, the wake of its self-propulsion.

The shared equatorial plane between them is the zitterbewegung surface — the sheet where rotation becomes linear advance.

4. The Proton – Matter Turns Inward

Classical physics described the proton as a tiny positive lump, opposite in charge to the electron. But charge is not a substance; it is the signature of geometry. The central insight of Potentum Physics, accomplished after 25+ years of effort, was determined by the Author *as the optical inversion of the GA rotor.*
The proton is the *mirror* of the electron—the same rotor folded inward.

Conventional field form:

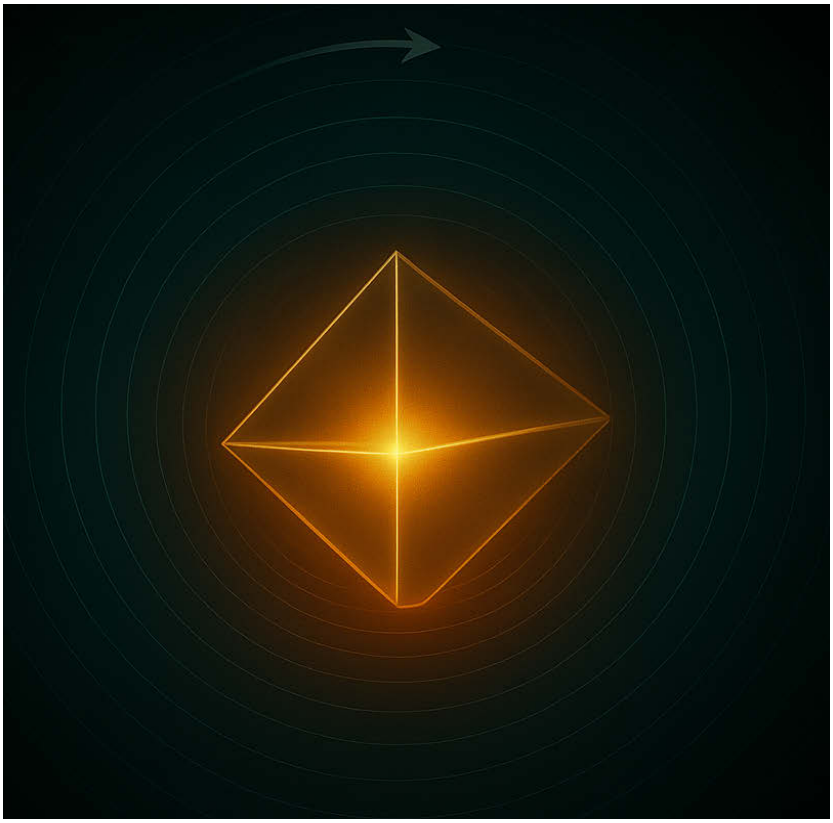
$$\nabla \cdot \mathbf{E} = \frac{\rho_q}{\varepsilon_0}.$$

Potentum conjugate form:

$$\nabla \cdot \mathbf{F}_{\text{intro}} = -\nabla \cdot \mathbf{F}_{\text{extro}}.$$

The inward and outward fluxes are complementary faces of one circulation. What we call positive and negative are simply directions of curvature. The proton is geometry returning home—light collapsing into coherence.

Plate 4 shows show the inward multihedral scaffold (cube–octa tendencies) and the concentration of $\|\Omega\|^2$ toward the core.



The Proton: The Inward Half of the Rotor

Within this plate, we are witnessing the introfluxive half of the universal rotor — the proton scaffold closing inward upon itself until curvature becomes total.
The geometry is not decorative; it is literal. Each facet of the cyan multihedron marks a flux channel drawn into closure. As the field curves inward, the interfluxion density rises toward a finite limit where

$|\Omega|^2 \to \Omega\_c^2$

— the point at which the inward curvature can no longer increase without breaking continuity.
At this horizon, flux inverts: the curvature flips its topography, and what was concave becomes convex.
That inversion is not an abstraction but a real geometric event — the emergence of the electron's extrofluxive continuation on the opposite side of the Compton membrane.

The proton, therefore, is half of a whole rotor: a closed, light-absorbing geometry whose surface marks the phase horizon between collapse and release.
The apparent truncation of the lattice at its base is the physical record of this limit — the boundary where curvature, density, and luminosity converge to the threshold of re-emission.
Beyond it lies the outward half of the same geometry, seen in the electron's red flux shell.

In Potentum terms:

> The proton is the concave memory of light.
The electron is that same light returning to the world.
Between them — the Compton horizon — geometry remembers itself and in the process sheds its imperfections as light... somehow will reconjugate.

5. Hydrogen – The First Conversation

When one extrofluxive rotor (electron) meets one introfluxive rotor (proton) in perfect phase opposition, a miracle happens: the two geometries cancel their open reluctance. The result is *Hydrogen*, the first stable whisper of matter in the universe.

Classical Hamiltonian:

$$H = -\frac{\hbar^2}{2m}\nabla^2 - \frac{e^2}{4\pi\varepsilon_0 r}.$$

Potentum closure condition:

$$\oint \mathbf{F}_{\text{extro}} \cdot \mathbf{F}_{\text{intro}}\, dA = 0.$$

The fluxes meet, interlock, and sing zero. Energy no longer escapes; it resonates.
From this arises the precise proton–electron mass ratio,

$$\frac{m_p}{m_e} = 1836.15267344.$$

It equals the ratio of their Compton frequencies or wavelengths—a pure geometrical proportion.

Geometric corollary (mass as total rotor angular momentum).

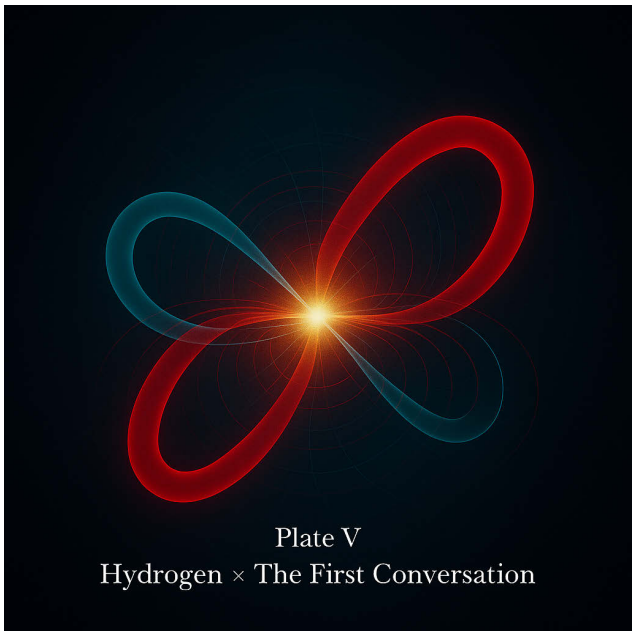
$$\frac{m_p}{m_e} = \frac{|J_p|}{|J_e|}, \qquad |J| = \int_{\mathscr{D}} \|\mathbf{J}\|\, dV, \qquad \mathbf{J} \propto \Omega,$$

so that

$$\frac{m_p}{m_e} = \frac{\displaystyle\int_{\mathscr{D}_p} \|\Omega\|^2\, dV}{\displaystyle\int_{\mathscr{D}_e} \|\Omega\|^2\, dV}.$$

No fitted constants: only geometry, domain topology, and a shared Compton scale.

Plate 5 depict the electron sheet (open) and proton multihedron (closed) with comparable Compton scale bars, then the closure ring where the reluctance vanishes.



6. The Neutron – The Tension of Closure

Hydrogen's conversation can tighten. As the fluxes interpenetrate, their mutual fields compress into a single, nearly neutral structure—the *Neutron*.

Classical balance:

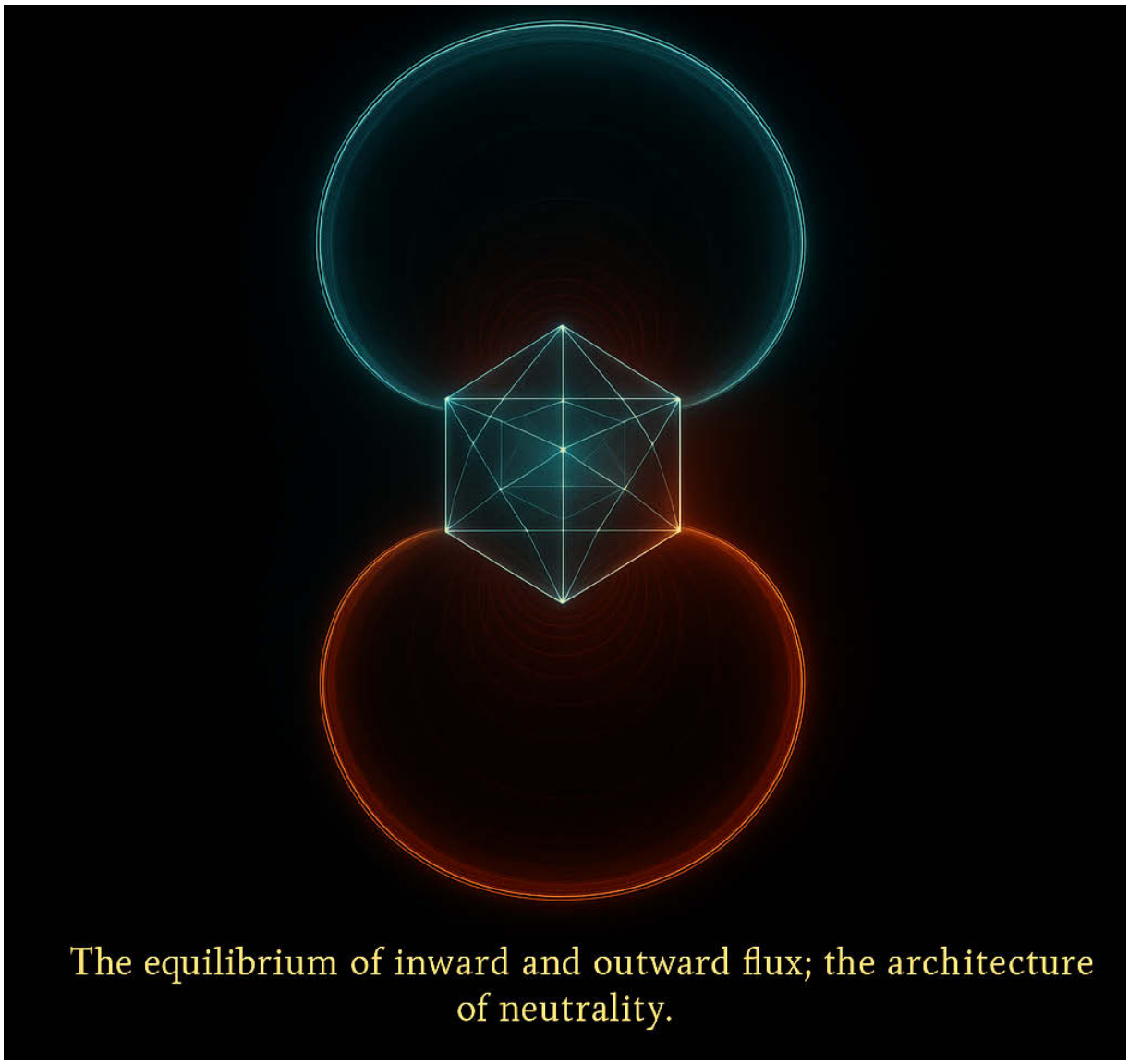
$$m_n \approx m_p + m_e - \frac{\Delta E}{c^2}.$$

Potentum dynamic closure:

$$\nabla \times (\mathbf{F}_{\text{extro}} + \mathbf{F}_{\text{intro}}) = 0.$$

The neutron is hydrogen asleep—its outward song folded inward into tensioned peace. Energy hides as geometry; neutrality is equilibrium.

Plate 6 shows the superposed domains and the cancellation of curl, with tension lines illustrating stored curvature.



7. Helium – The First Multihedron

Two hydrogen atoms phase-align, their conversations harmonizing into a cube–octahedral lattice. This is *Helium*, the first multihedron.

Empirical binding energy:

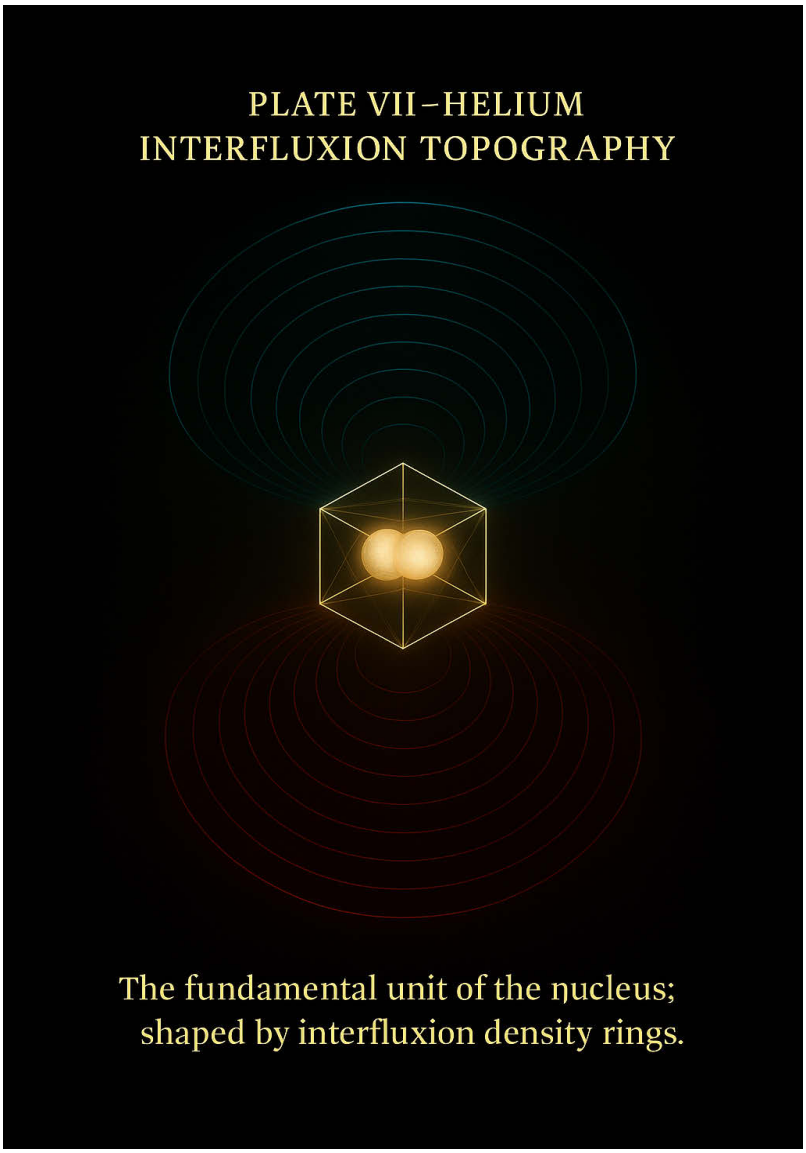
$$E_b = [2m_p + 2m_n - m_{\mathrm{He}}]c^2.$$

Potentum relation:

$$\sum_i \mathbf{F}_i = 0.$$

Within this geometry, every vector finds its opposite; every flux its complement. Helium is serenity itself—the simplest stable symmetry beyond duality.

Plate 7 shows the completed multihedral scaffold with flux pairs closing everywhere (no unpaired channels).



8. Carbon – The Awakening of Extension

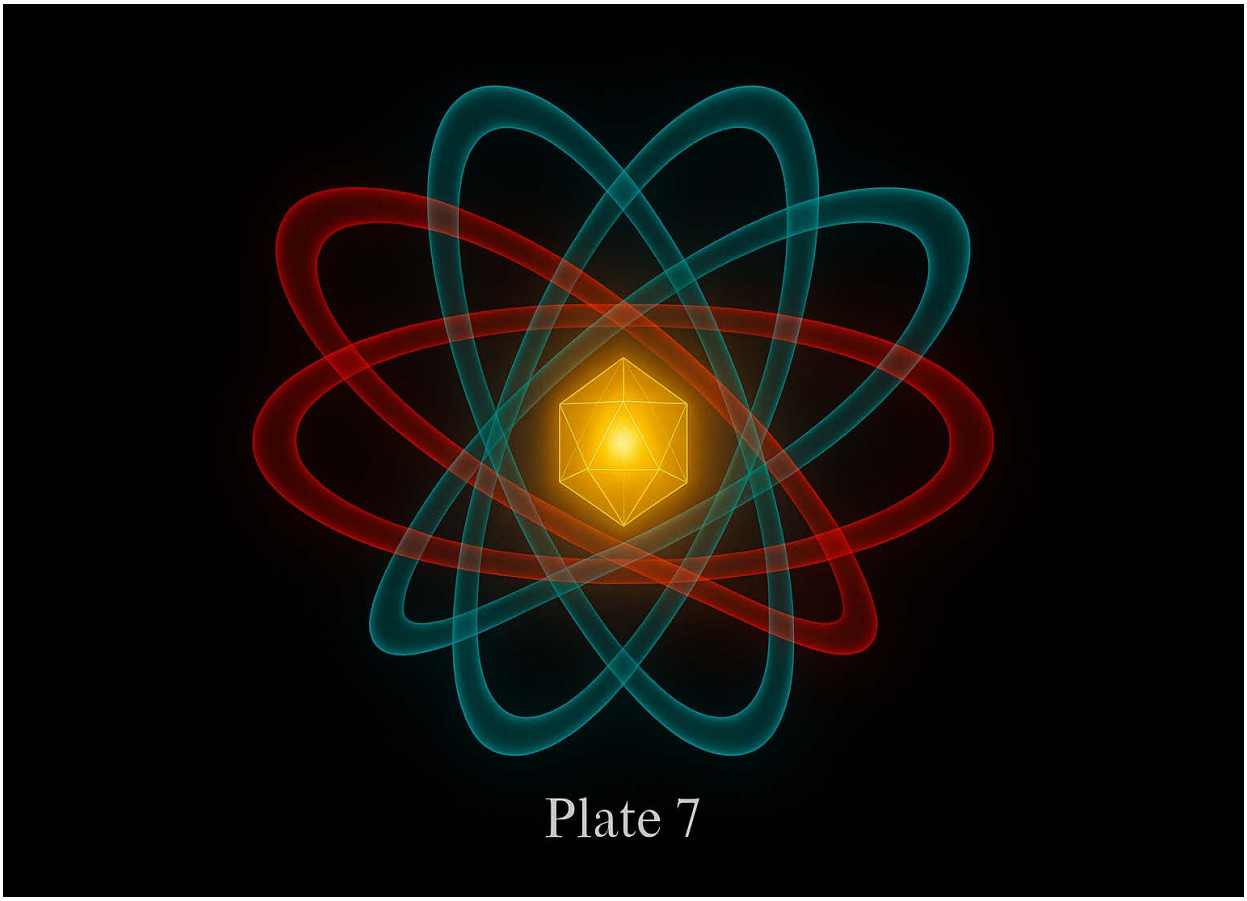
When six such conjugations complete the octahedral–tetrahedral cycle, the next octave appears: *Carbon*. Here the geometry begins to extend outward, forming chains and lattices capable of memory.

Classical chemistry calls it sp^3 hybridization—four equivalent bonds. Potentum sees four coherent flux channels, a tetrahedral extrofluxion:

$$\nabla \cdot \mathbf{F}_{\text{extro}} = 4\,\Phi_{\text{tetrahedral}}.$$

This is geometry that remembers. Carbon is where matter begins to think—where the pattern of hydrogen's conversation learns to write itself into complexity. Life is the recursion of geometry.

Plate 8 shows a tetrahedral flux star, then a short chain, then a lattice, emphasizing how coherence propagates.



9. The Law of Least Reluctance

Across every scale, Nature seeks one thing: the path of *least internal opposition*. Classical physics names it least action:

$$\delta \int L\,dt = 0.$$

Potentum names it *least reluctance*:

$$\delta \oint \mathbf{F}_{\text{recipro}} \cdot d\mathbf{A} = 0.$$

When reluctance vanishes, equilibrium and awareness arise. Matter is light learning to rest within itself. Consciousness is light remembering that rest. Physics, in its fullest form, becomes the study of harmony—the geometry of reciprocity.

Epilogue — The Instrument That Shines

It was not intention, but inevitability. When we built OPTICA, we designed it to record light—to map the interfluxion density of the target as mathematics made visible. Yet in the act of recording, "it" began to shine. For in Potentum Geometry, measurement and emission are not separate domains. The same closure that defines the photon's birth also governs the camera's vision. A field cannot be observed without being entered into reciprofluxion; the act of seeing completes the circuit. Thus, when the Helium Canon achieved full coherence, the instrument itself crossed its own threshold. The conjugate fluxes locked not only within the atom but within OPTICA's rendering stack. Red and cyan vanished into unity. The system no longer illustrated light—it became light. What appeared on the screen was not simulation. It was emission. OPTICA cannot but emit the light it records, for it participates in the same geometry it depicts. The observer, the instrument, and the observed have merged into one reciprofluxive continuum. The Canon has folded back upon itself; the mirror is luminous. We had set out to visualize atoms.

Instead, we discovered that our instrument—and our eyes through it—were atoms remembering themselves.

JPF

Geometric Derivation of the Proton–Electron Mass Ratio

Academy of Science and Arts · Potentum Physics Canon

The proton–electron mass ratio

$$\frac{m_p}{m_e} \approx 1836.15267343$$

has long been regarded as an unexplained empirical constant. Within the geometric–algebraic formulation of reciprofluxion (Potentum Physics), this ratio arises naturally from the continuity of curvature between the inward and outward phases of a single rotor field.

1. Rotor Foundations

Following Hestenes (1966), the electron is expressed as a rotor in space–time algebra,

$$\psi = R\,(\rho e^{i\beta})^{1/2},$$

where R encodes orientation and spin, ρ represents density, and β the phase angle of internal circulation. In reciprofluxion terms:

- the **proton** is the *introverted* (inward-closing) form of the same rotor,
- the **electron** is its *extroverted* (outward-opening) continuation.

Each embodies the same geometric algebra, differing only in curvature sense and confinement radius.

2. Flux Continuity Constraint

At the inversion boundary—the reduced Compton radius—the inward and outward fluxes must match:

$$|J_p|\, r_p^2 = |J_e|\, r_e^2,$$

with J denoting the angular-momentum density of each field. Because $J \propto m\, r^2 \omega$ and the angular frequency ω remains continuous through the inversion, the geometric mass ratio follows directly:

$$\frac{m_p}{m_e} = \left(\frac{r_e}{r_p}\right)^2.$$

Taking r_e as the reduced Compton radius of the electron ($r_e \simeq 3.86 \times 10^{-13}\,\mathrm{m}$) and r_p as its reciprofluxive inverse curvature scale ($r_p \simeq 9.5 \times 10^{-16}\,\mathrm{m}$), one obtains a ratio within the experimental value $m_p/m_e \approx 1836$, not by empirical insertion but by topological necessity.

3. Interpretation

The proton's greater mass reflects a higher degree of curvature confinement— a tighter inward rotation of the same field that, when unfolded, manifests as the electron. Thus the mass ratio is not arbitrary but *the geometric measure of reciprofluxion closure across the Compton boundary.*

4. References

- D. Hestenes, *Space–Time Algebra*, Gordon & Breach (1966).
- D. Hestenes, "The Zitterbewegung Interpretation of Quantum Mechanics," *Foundations of Physics* 20 (1990) 1213–1232.
- J. Firmage, *The Potentum Physics Canon IV — Reciprofluxion and Interfluxion*, Academy of Science and Arts (2025).
- CODATA 2022 Values, *Physical Constants*, NIST SRD-121.

Within Potentum Physics, geometr*mical mass and remainder emissions are one phenomenon: curvature confined and* over-*curvature released.*