Quantum Mechanics Reinterpreted: {2,3,5,π} Lattice Foundations of the Bohr-Schrödinger Framework

Author: Stephen Daubney | thedaubneyfoundation@gmail.com

The Universal Force of Time — Academic Series | Paper 7 of 25

Propositions P-QM-1 through P-QM-10 | Source: Vol3 Sections 258, 261, 269

§1 — Abstract

This paper establishes that the entire quantum mechanical framework — Bohr energy levels, Schrödinger equation, de Broglie relation, spin quantisation, selection rules, and the anomalous magnetic moment — is a dimensional address substitution in the {2,3,5,π} prime lattice. The hydrogen ground state $G1 = m_e \cdot c^2 \cdot \alpha_{FOT}^2/2$ is exact to 0.000 ppm. All energy levels $E_n = G1/n^2$ are pure lattice addresses. The Schrödinger equation is a dimensional address substitution; wavefunctions ψ are Tau-address probability amplitudes. Planck, Bohr, Schrödinger, and de Broglie are four formulations of the same {2,3,5,π} dimensional flow law.

§2 — The Quantum Consistency Theorem

P-QM-1 (Quantum Consistency Theorem): $G1 = m_e \cdot c^2 \cdot \alpha_{FOT}^2/2$ — exact (0.000 ppm) Algebraic proof: $[2^9 \times 3^8 \times 5^6 \times \pi^4 \times 10^{-7}] \times [3^4/(5^6\pi^4)] / 2 = 2^8 \times 3^{12} \times 10^{-7} = G1$ The π^4 and 5^6 cancel exactly. G1, $m_e \cdot c^2$, and α_{FOT} are one lattice identity in three projections. Given any two, the third is determined exactly by {2,3} arithmetic alone.

§3 — Hydrogen Energy Levels as Lattice Addresses

$E_n = -G1/n^2$ with $G1 = 2^8 \times 3^{12} \times 10^{-7}$ eV Level n=1 (ground): $E_1 = -G1 = -13.5977$ eV Level n=2: $E_2 = -G1/4 = -3.3994$ eV (denominator 2^2) Level n=3: $E_3 = -G1/9 = -1.5109$ eV (denominator 3^2) Level n=5: $E_5 = -G1/25 = -0.5439$ eV (denominator 5^2) Denominators at n=2,3,5 are 2^2, 3^2, 5^2 — squares of the FOT lattice primes. n=7: denominator 7^2 = first prime OUTSIDE the lattice — exactly as prime 7 is excluded from musical consonance.

§4 — Schrödinger as Dimensional Address Substitution

The Schrödinger equation $i\hbar\partial\psi/\partial t = -(\hbar^2/2m)\nabla^2\psi + V\psi$ in FOT notation: ψ is the Tau-address probability amplitude; $|\psi(r)|^2$ is the probability of finding the node's Tau-coordinate at r. Each stationary eigenstate ψ_n is the standing Tau-wave of the lattice at each (n,l,m) address.

Kinetic factor: $\hbar^2/(2m) = h^2/(8\pi^2 m) = h^2/(2^3\pi^2 m)$ Denominator: $2^3\pi^2 = \{2\}^3 \times \pi^2$ (pure {2} cubic times radian-squared) De Broglie orbit closure: $n \cdot \lambda_{dB} = 2\pi \cdot r_n$ (n complete wavelengths per orbit) Follows from $L = n\hbar = nh/(2\pi)$ rearranged. Bohr quantisation and de Broglie = the same {2,π} statement in two languages.

§5 — The Balmer Ladder

Balmer ladder wavelength span: Lowest: n=3→2, $\lambda = 36 \times 3^5/(5 \times 3^2)$ nm $= 2^2 \times 3^3 \times 5/1$ nm [Hα region] Highest: Lyman limit, $\lambda_\infty = 3^6/2^3 = 91.125$ nm Ratio: $\lambda_{H\alpha} / \lambda_{Lyman\_limit}$ — the ladder spans exactly $(6/5)^3$ in wavelength: $(6/5)^3 = 216/125 = 1.728 = 2^3 \times 3^3/5^3$ [exact lattice ratio] $H\beta = 2 \times 3^5$ nm is the master seed of the entire Balmer series.

§6 — Registered Propositions: P-QM-1 through P-QM-10

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P-QM-1	Quantum Consistency Theorem: $G1 = m_e \cdot c^2 \cdot \alpha_{FOT}^2/2$ exact (0.000 ppm). π^4 and 5^6 cancel algebraically. G1, $m_e \cdot c^2$, and α_{FOT} are one lattice identity in three projections.
P-QM-2	Bohr radius $a_0 = 5^3\pi h/(2\times 3^2\times m_e\times c) = 125\pi h/(18\cdot m_e\cdot c)$ — pure $\{2,3,5,\pi\}$. Numerical: 52.934 pm vs NIST 52.918 pm; 305 ppm (α_{FOT} unit-offset).
P-QM-3	Energy levels $E_n = -G1/n^2$ with $G1 = 2^8\times 3^{12}\times 10^{-7}$ eV. Denominators n^2=4,9,25 at n=2,3,5 are $2^2,3^2,5^2$ — squares of the FOT lattice primes. n=7 introduces the first prime outside the lattice, as prime 7 is excluded from musical consonance.
P-QM-4	$\hbar = h/(2\pi) = G1/(2\pi c R_{\infty}\_FOT)$. The $\{2,\pi\}$ radian bridge $2\pi = 2^1\times\pi$ carries $\{2\}$ (octave) and π (radian). Every $\hbar$ in QM carries this factor exactly once.
P-QM-5	Zero-point energy $\hbar\omega/2$: $½ = 2^{-1}$ pure $\{2\}$. Minimum Tau-flow rate required for nodal identity. For hydrogen n=1: ZPE = $G1/4 = 2^6\times 3^{12}\times 10^{-7}$ eV — pure $\{2,3\}$.
P-QM-6	Spin $½ = 2^{-1}$. All fermions carry $\{2\}^{-1}$ spin mode. All bosons carry integer spin. Pauli exclusion acts on $\{2\}^{-1}$-mode particles only. Spin multiplicity 2s+1=2: the $\{2\}$-doubling produces the matter/antimatter strand pair.
P-QM-7	Selection rules $\Delta l=\pm1$, $\Delta m=0,\pm1$, $\Delta s=0$ are unit hops in the (l,m,s) Tau-address lattice. Total states at level n: $2n^2 = \{2\}\times n^2$ — the $\{2\}$ factor is the spin doubling of n^2 angular momentum sub-states.
P-QM-8	Anomalous magnetic moment leading QED correction: $\alpha/(2\pi) = 3^2/(2\times 5^3\times\pi^3) = 9/(250\pi^3)$ — pure $\{2,3,5\}/\pi^3$. The full QED expansion is a power series in $[3^2/(2\times 5^3\times\pi^3)]^n$ — every order is $\{2,3,5,\pi\}$.
P-QM-9	Schrödinger equation: ψ is the Tau-address probability amplitude. Kinetic factor $\hbar^2/(2m) = h^2/(8\pi^2 m) = h^2/(2^3\pi^2 m)$. Stationary eigenstates = standing Tau-waves at $\{n,l,m\}$ addresses.
P-QM-10	De Broglie closure: $n\cdot\lambda_{dB} = 2\pi\cdot r_n$ exact to 0.0000 ppm. Angular momentum $L = n\hbar = nh/(2\pi)$ rearranges to $n\cdot\lambda_{dB} = 2\pi r$. Bohr quantisation and de Broglie wave mechanics are the same $\{2,\pi\}$ statement in two Tau-address languages.

Cross-references: Vol3 Sections 258, 261, 269 | P-ACOUS-2 (prime 7 exclusion from consonance)

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