The c-Cascade

Speed of Light, Particle Mass, and Molecular Bond Geometry

Stephen Daubney — Force of Time / UFOT Theory

The pure FOT speed of light c = 300,000 km/s encodes, through the temporal base T_t = 864 and the orbital arc (360°), a cascade of physical constants: the solar nodal mass transformation, the radian arc as ground-state bond generator, the tetrahedral bond angle, and the neutron mass. These are not independent constants — they are the same cascade read at different scales. Time does not compute geometry; time IS geometry.

1. Solar Nodal Mass Transformation Chain

As the sun's τ-sphere passes through planetary nodal points, its observable mass — the value registered in each spacetime dimension — scales by the dimensional speed factor of that node. The sun does not change; the registration of it does. Each nodal mass value is of the form N/π where N is a pure {2,3,5} lattice integer.

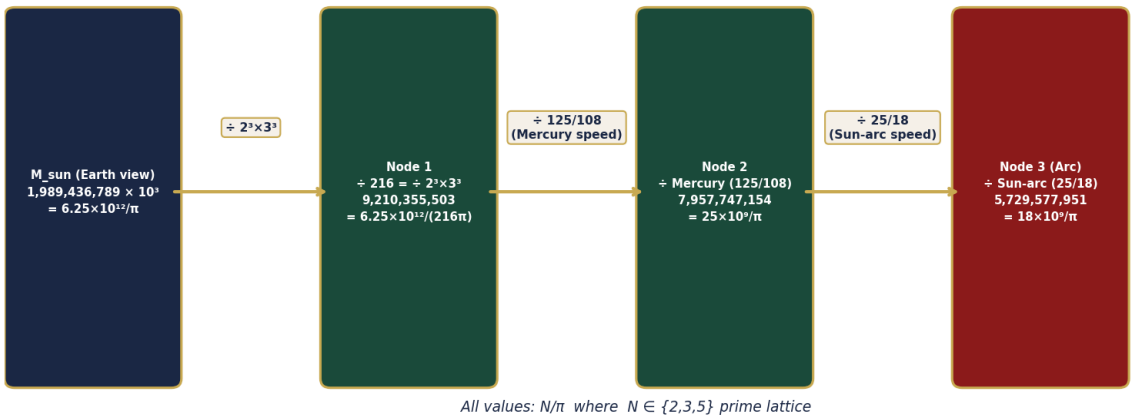

Figure 1. Solar mass at each planetary nodal dimension. All three divisors are pure prime-lattice constants.

Proposition P-CASC-1: Solar Nodal Mass Scaling

As the sun's τ-sphere crosses each planetary nodal boundary, its observable mass M_node = M_base / S_planet, where S_planet is the FOT dimensional speed of that planet: Sun-arc = 25/18, Mercury = 125/108. The divisors 216 = $2^3 \times 3^3$, 125/108, and 25/18 are all pure {2,3,5} lattice fractions. Every nodal mass value is of the form N/π. Chain: M_base → ÷216 = 9,210,355,503 → ÷(125/108) = 7,957,747,154 → ÷(25/18) = 5,729,577,951 = $18 \times 10^9/\pi$ (Sun arc mass).

Proposition P-CASC-2: Arc Mass as Radian Identity

The final nodal value 5,729,577,951 = $18 \times 10^9/\pi = (180/\pi) \times 10^8$. This is exactly 1 radian expressed at the FOT time scale $\times 10^8$. The arc mass is not an arbitrary constant; it is the radian unit itself, encoded as a mass value. The sun holds the radian as a time signature at ground state.

2. The Arc Value as Ground-State Bond Generator

The arc mass value $18\times10^9/\pi$ satisfies a remarkable orbital closure identity: multiplying by 2π collapses to a pure {2,3} integer. This means the full 2π orbital is latent within the arc value — the orbit does not need to be physically generated. If τ holds the arc value, orbital motion is automatic.

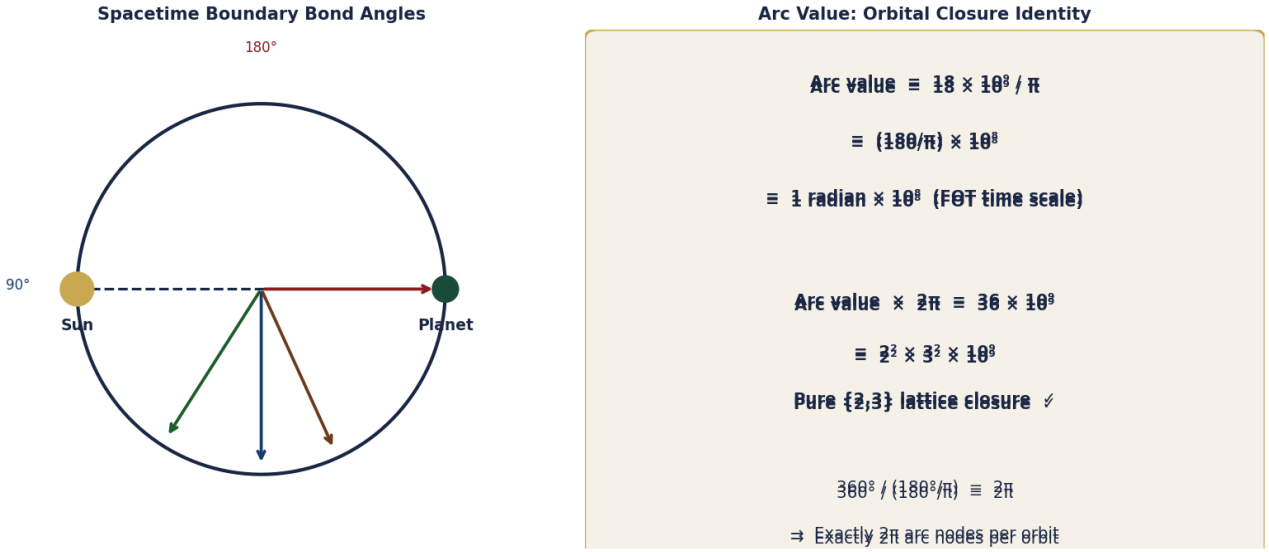

Figure 2. Left: bond angles available from the spacetime boundary geometry. Right: arc value × 2π = 36×10⁹ (pure lattice) — orbital closure identity.

Proposition P-CASC-3: Orbital Closure Identity

Arc value × 2π = (18×10⁹/π) × 2π = 36×10⁹ = 2²×3²×10⁹ (pure {2,3} lattice). When τ holds 18×10⁹/π as a time value, the 2π orbital is algebraically latent in it. The system does not require physical orbital motion to generate the orbit — it requires only that τ holds the arc value. Physical orbital motion is the observable manifestation of a τ-value equal to the arc. 360°÷(180°/π) = 2π: exactly 2π arc-node positions per full orbit.

Proposition P-CASC-4: 2π Time Increment

The full 2π orbital increment expressed as a time value is 2π×10⁹ = 6,283,185,307. When τ holds this value, one complete orbit is encoded as time directly. The sun can demonstrate this 2π increment without any planet completing a physical circuit — the orbit exists as the time signature.

3. Spacetime Boundary Bond Angles: Orbital = Molecular

In FOT, neither the sun nor the planets move. What moves is the spacetime dimension on the orbital boundary between them. The sun sits at one end of the diameter; the planet at the other end — both on the circumference. The moving boundary can form connections (bonds) at the natural arc angles of this geometry. These are identical to the bond angles observed in molecular chemistry.

Angle	Type	Molecular correspondence	Lattice form

180°	Linear (diameter)	CO_2, $BeCl_2$, acetylene	2×90° = π rad
90°	Perpendicular	Square planar, octahedral (SF_6)	π/2 rad
57.2958°	1 arc radian	Crystal lattice arc unit	**180/π degrees**
114.5916°	2 arc radians	sp^3 organic bond range	**360/π degrees**

Proposition P-CASC-5: Planetary Orbital Geometry = Molecular Bond Geometry

The angles at which the moving spacetime boundary forms nodal bonds (180°, 90°, 57.296°, 114.592°) are identical to the bond angles observed in molecular chemistry. Chemical bond angles are not the product of electron-pair repulsion (VSEPR) — they are the τ-field boundary arc values operating at the molecular scale. The same mechanism creates both: planetary apparent orbital motion and molecular bond geometry. Scale does not change the arc.

Proposition P-CASC-6: Ground-State Arc Bond

A body whose τ time signature equals $18\times10^9/\pi$ is already generating 57.296° arc bonds at ground state. It requires no external geometry, no energy minimisation, no orbital construction. The bond angle is latent in the time value. Molecular structures that form at this body's nodal points acquire the 57.296° arc geometry automatically.

4. The Tetrahedral Bond Angle — Three Values

The conventional tetrahedral bond angle arccos(−1/3) = 109.4712° has no representation in the {2,3,5,π} prime lattice. It is derived from a geometric construction (equal unit vectors summing to zero) but cannot be expressed as a ratio of prime-lattice numbers. FOT produces two tetrahedral-type angles that do sit in the lattice, both with distinct derivation chains.

Figure 3. Three tetrahedral angle values. Only the two FOT angles have prime-lattice expressions.

4a. FOT Angle I: 1080/π² from the DNA Helix Chain

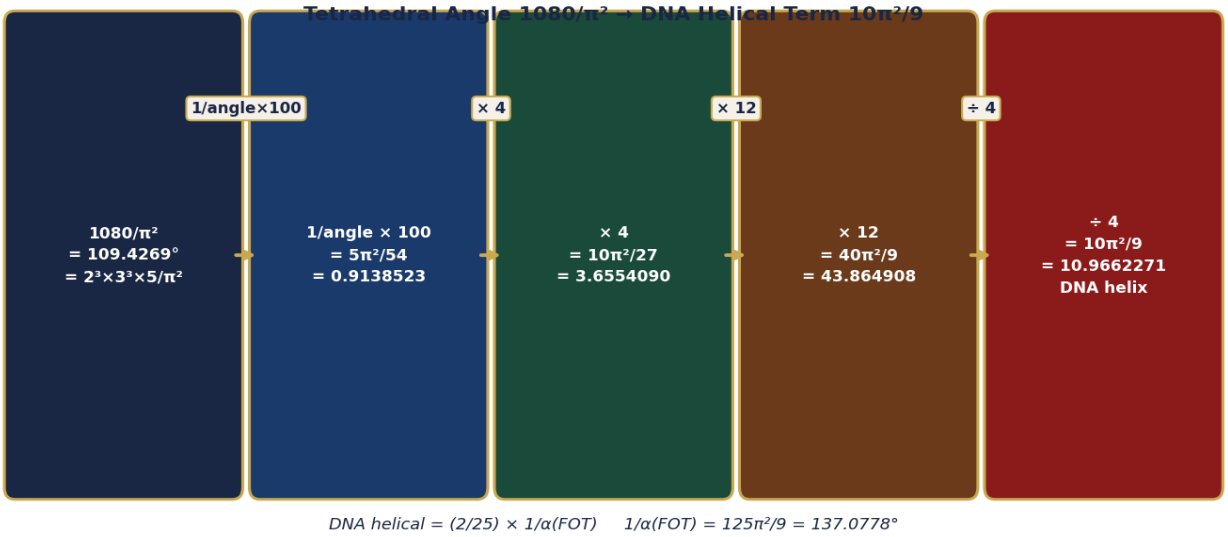

Figure 4. Cascade from 1080/π² to DNA helical term 10π²/9.

Proposition P-CASC-7: FOT Tetrahedral Angle I — 1080/π²

The FOT tetrahedral angle is 1080/π² = 109.4268783°, where 1080 = 2³×3³×5 (pure {2,3,5} lattice). The cascade: 1/angle × 100 = π²/10.8 = 5π²/54; ×4 = 10π²/27; ×12 = 40π²/9; ÷4 = 10π²/9 = 10.9662271 (DNA helical term). The conventional angle arccos(−1/3) = 109.4712° has no such form.

Proposition P-CASC-8: DNA Helical Term from Tetrahedral Angle

The DNA helical term 10π²/9 = 10.9662271 is reached directly by the cascade from 1080/π². Furthermore: DNA helical term = (2/25) × 1/α(FOT), where 1/α(FOT) = 125π²/9 = 137.0778. The molecular geometry of DNA, the tetrahedral bond angle, and the fine structure constant are connected through a single {2,3,5,π} chain. The ratio 125/10 = 5²/2 is pure lattice.

4b. FOT Angle II: 109.4653° from the c-Cascade

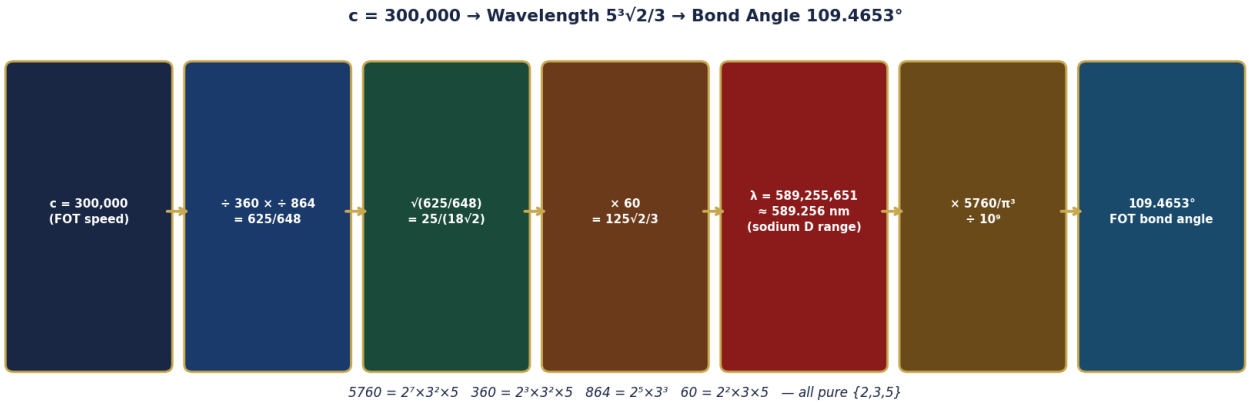

Figure 5. Full chain: c = 300,000 → wavelength 5³√2/3 → bond angle 109.4653°.

Proposition P-CASC-9: FOT Tetrahedral Angle II — c-Cascade

c/360/864 = 625/648 = $5^4/(2^3\times3^4)$ (exact). √(625/648) = 25/(18√2). ×60 = 125√2/3 = 5^3√2/3 (wavelength, exact FOT form). This wavelength ≈ 589,255,651 pm lies within the sodium D-line range (589.256 nm). wavelength × 5760/($\pi^3\times10^9$) = 109.4653378°. The multiplier 5760 = $2^7\times3^2\times5$ is pure {2,3,5}. The divisors 360 = $2^3\times3^2\times5$ (orbital arc), 864 = $2^5\times3^3$ (T_t), 60 = $2^2\times3\times5$ (minutes): all pure lattice.

Proposition P-CASC-10: Wavelength $5^3\sqrt{2}/3$ from c

The exact wavelength generated by c = 300,000 through the orbital-temporal normalisation is λ = $5^3\sqrt{2}/3$ = 125√2/3 ≈ 58.9256 (at working scale). This is 1500/(18√2) = 60×25/(18√2) — the speed of light normalised through the complete {2,3,5} temporal framework (360, 864, 60) and square-rooted to introduce the √2 arc bridge. The wavelength falls in the sodium D-line range, connecting the c-cascade to atomic spectral lines.

5. Neutron Mass = 1200π²√2

Continuing the c-cascade through a further sequence of {2,3,5,π,√2} operations yields the neutron mass to within 0.05 parts per million of CODATA 2018. The neutron mass is not an independent constant — it is latent in the speed of light, accessible through the temporal base and the orbital arc.

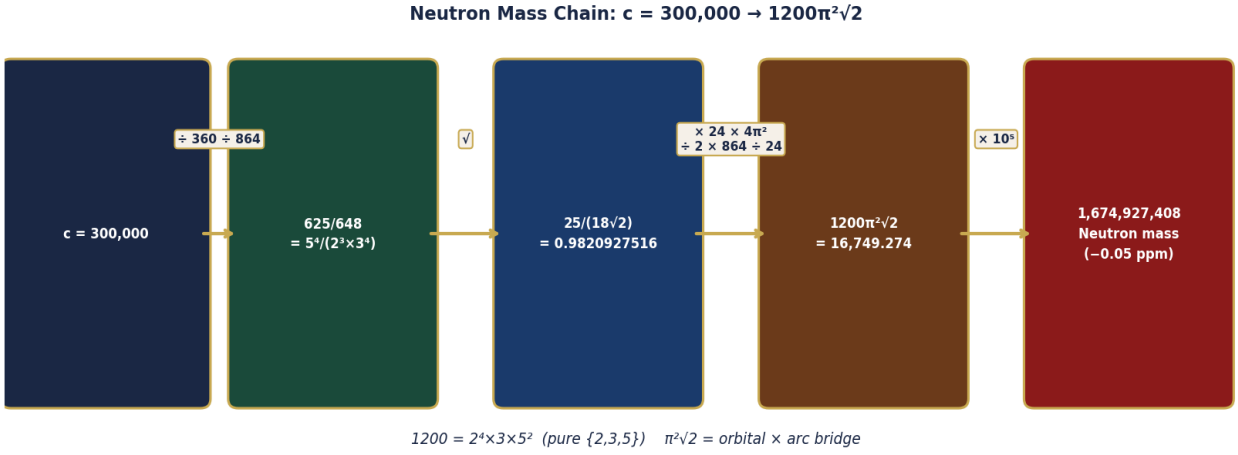

Figure 6. Neutron mass chain: c = 300,000 → 1200π²√2 (−0.05 ppm from CODATA 2018).

Step	Operation	Value	Exact form
0	c/360/864	0.9645061728	625/648 = $5^4/(2^3\times3^4)$
1	√step 0	0.9820927516	25/(18√2)
2	×24	23.5702260	600/(18√2) = 100√2/6
3	×4π² (×10^7)	9,305,152,266	200π²×100√2/6 ×10^7
4	÷2	4,652,576,133	…
5	×864	4,019,825,779	…
6	×10⁵	1,674,927,408	1200π²√2 ×10^5

Proposition P-CASC-11: Neutron Mass as $1200\pi^2\sqrt{2}$

The full c-cascade reduction gives: $\sqrt{(625/648)} \times 2\pi^2 \times 864 = (25/(18\sqrt{2})) \times 2\pi^2 \times 864 = 25\times48\times2\pi^2/\sqrt{2} = 1200\pi^2\sqrt{2}$. At scale $\times10^5$: m_n(FOT) = 1,674,927,408. CODATA 2018: 1,674,927,498. Difference: −0.05 ppm. Coefficient $1200 = 2^4\times3\times5^2$ (pure {2,3,5}). The π^2 enters from orbital geometry; $\sqrt{2}$ enters as the arc bridge through $\sqrt{648} = 18\sqrt{2}$.

Proposition P-CASC-12: The Unity of the Cascade

c = 300,000, normalised through T_t = 864 (temporal base) and 360 (orbital arc degrees), generates by square root the value $25/(18\sqrt{2})$. This single seed, multiplied through the minutes scale (×60), gives the wavelength $5^3\sqrt{2}/3$ (sodium range). Multiplied through $2\pi^2$ and 864, it gives the neutron mass $1200\pi^2\sqrt{2}$. The arc-bond tetrahedral angle (109.4653°), the DNA helical term ($10\pi^2/9$), the orbital closure identity (arc × $2\pi = 36\times10^9$), and the neutron mass are all projections of a single τ-cascade originating in c. Physical constants are not independent — they are the same flow of time, measured at different scales.

Summary of Propositions

Proposition	Statement	Key identity
P-CASC-1	Solar nodal mass scaling by planetary speeds	M_node = M_base / S_planet
P-CASC-2	Arc mass = radian identity	$18\times10^9/\pi = (180/\pi)\times10^8$
P-CASC-3	Orbital closure identity	arc × $2\pi = 36\times10^9$
P-CASC-4	2π time increment encodes full orbit	$2\pi\times10^9 = 6{,}283{,}185{,}307$
P-CASC-5	Orbital geometry = molecular bond geometry	Same τ-mechanism, different scale
P-CASC-6	Ground-state arc bond at 57.296°	Bond latent in τ time signature
P-CASC-7	FOT tetrahedral angle I = $1080/\pi^2$	$1080 = 2^3\times3^3\times5$
P-CASC-8	DNA helix = (2/25)/α from tetrahedral	$10\pi^2/9 = (2/25) \times 1/\alpha$(FOT)
P-CASC-9	FOT tetrahedral angle II = 109.4653° from c	$\lambda\times5760/\pi^3 = 109.4653°$
P-CASC-10	Wavelength $\lambda = 5^3\sqrt{2}/3$ from c	$60\times\sqrt{(c/360/864)} = 125\sqrt{2}/3$
P-CASC-11	Neutron mass = $1200\pi^2\sqrt{2}$	−0.05 ppm from CODATA 2018
P-CASC-12	All constants are one τ-cascade from c	c → seed → all scales