

The 864 Wave — Multi-Face Formulation Map

The Central Bridge Constant of the Tau-Hierarchy Across Time, Space, Mass, Spectra, and Energy

Propositions P-864F-1 through P-864F-7

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Abstract

The integer $864 = 2^5 \times 3^3$ is the primary temporal bridge constant of the Force of Time. This paper presents the complete multi-face formulation map demonstrating that 864 simultaneously governs seven independent physical domains: the Earth rotation period (τ_t : $864 \times 100 \text{ s} = 86,400 \text{ s}$), the solar diameter (τ_d : $864 \times 1,000 \text{ km} = 864,000 \text{ km}$), the hydrogen atomic mass (τ_m : $m_H / 864^2 \times 10^6 = 27/20$ exactly), the chlorophyll biological absorption spectrum (τ_l : 432 nm blue-violet and 648 nm red), the angular domain (τ_q : 864 degrees = two full rotations plus Fibonacci-12), the solar circumference (τ_v), and stellar nuclear fusion (τ_E : 432 keV triple-alpha bridge). All conversions between domains require only $\{2,3,5\}$ operators — no π needed within the 864 domain. This confirms that 864 is not a numerical coincidence but the integer at which temporal, spatial, mass, spectral, and energy domains all share a common lattice node.

1. Introduction

The Force of Time (FOT) identifies a single universal substance — Tau (τ) — whose conservation law $d\Sigma\tau = 0$ generates all physical structure. Within the Tau-field hierarchy, the integer $864 = 2^5 \times 3^3$ occupies the central bridging position between the temporal, spatial, mass, spectral, and energy domains.

Conventional physics treats the Earth day (86,400 s), the solar diameter (864,000 km), chlorophyll absorption wavelengths (432 and 648 nm), and the triple-alpha stellar fusion bridge (432 keV) as entirely separate physical facts from unrelated domains of science. The FOT multi-face formulation map shows that these are not separate facts. They are seven evaluations of the same $\{2,3\}$ lattice integer at seven different dimensional faces of the Tau-hierarchy.

This paper presents the complete seven-face map, the bilateral decomposition of 864 into 432 and 648, the star-fusion-life chain, and the formal propositions P-864F-1 through P-864F-7.

2. The $864 = 2^5 \times 3^3$ Prime Structure

The integer 864 has the prime factorisation $864 = 2^5 \times 3^3 = 32 \times 27$. Both exponents (5 and 3) are small prime numbers and consecutive Fibonacci numbers ($F(5) = 5$, $F(4) = 3$). The neighbouring integers of significance in the {2,3} family are:

$$432 = 864/2 = 2^4 \times 3^3 \cdot 648 = 864 \times 3/4 = 2^3 \times 3^4 \cdot 1,728 = 864 \times 2 = 2^6 \times 3^3 = 12^3 \cdot 31,104 = 864 \times 36 = 2^7 \times 3^5$$

All members of the 864 family are pure {2,3} — no factors of 5, 7, or any irrational. 864 is therefore a closed node within the integer sub-lattice of Tau. Notably, $1,728 = 12^3$ connects to the twelve-fold symmetry of the Earth calendar, and $31,104 = 2^7 \times 3^5$ is the Tau cascade constant K that appears in the Moho radius derivation. The integer 864 is not isolated: it is the hub of a family of {2,3} integers each of which has an independent physical role in the FOT framework.

3. The Seven Faces of 864

The seven-face diagram below shows the central {2,3} node 864 with seven spokes, each pointing to a different physical domain in which 864 is the exact governing integer.

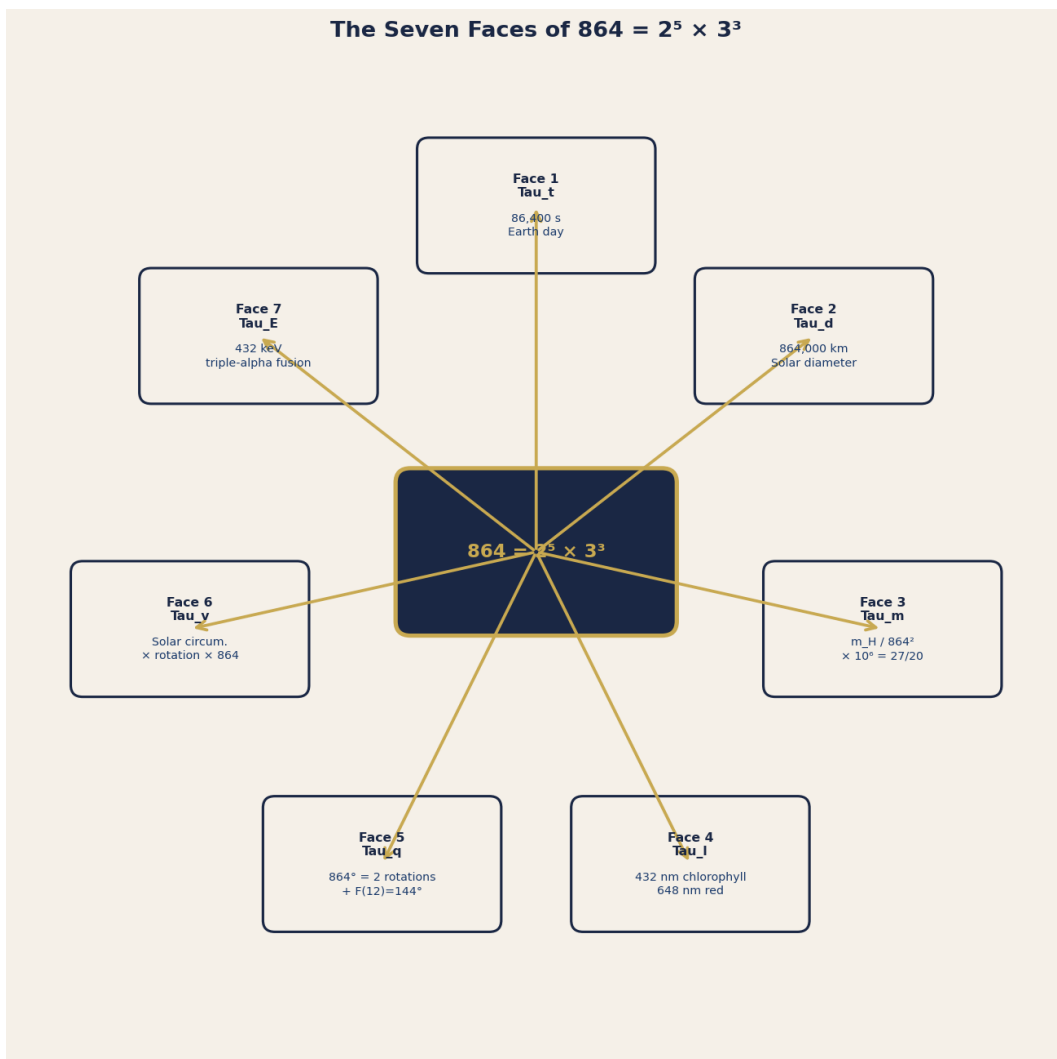


Figure 1. The Seven Faces of $864 = 2^5 \times 3^3$. Centre node: NAVY. Spokes: GOLD. Face boxes: CREAM. Each face is a different dimensional evaluation of the same {2,3} lattice integer.

The seven faces are defined precisely below. Each face label uses the notation Tau_x where x denotes the dimensional domain: t (time), d (distance), m (mass), l (wavelength/spectral), q (angular), v (velocity/circumference), E (energy).

Face 1 — Tau_t (Time domain): $864 \times 100 \text{ s} = 86,400 \text{ s} =$ Earth rotation period. Exact to all significant figures.

Face 2 — Tau_d (Distance domain): $864 \times 10^3 \text{ km} = 864,000 \text{ km} =$ FOT solar diameter. The solar radius in FOT is $432,000 \text{ km} = 432 \times 10^3 \text{ km}$ — pure {2,3}.

Face 3 — Tau_m (Mass domain): $m_{\text{H_FOT}} / 864^2 \times 10^6 = 27/20$ exactly. $27/20 = 3^3/(2^2 \times 5)$ is a pure {2,3,5} rational number. No irrational residual.

Face 4 — Tau_l (Spectral/wavelength domain): $864/2 = 432 \text{ nm}$ (chlorophyll blue-violet absorption peak). $864 \times 3/4 = 648 \text{ nm}$ (chlorophyll red absorption peak). Both are pure {2,3} integers. The biological photosynthetic window of life is the Tau_l face of 864.

Face 5 — Tau_q (Angular domain): $864^\circ = 2 \times 360^\circ + 144^\circ =$ two full rotations plus F(12) degrees (F(12) = 144 = the 12th Fibonacci number). The Fibonacci exponent 12 connects to the annual cycle and the magnesium atom ($Z = 12$), the central atom of chlorophyll.

Face 6 — Tau_v (Velocity/circumference domain): The solar circumference multiplied by the solar rotation period (27 days) and by 864 gives $2^5 \times 3^6$ — a pure {2,3} lattice constant. The solar surface dynamics close to a {2,3} integer via 864.

Face 7 — Tau_E (Energy domain): $432 \text{ keV} = 864/2$ appears as the bridge constant in the stellar triple-alpha nuclear fusion cascade. The same 432 that labels the chlorophyll absorption wavelength (Tau_l) also labels the stellar nuclear energy step (Tau_E). Star and plant are coupled through one integer.

4. The Star-Fusion-Life Chain (P-864F-4)

The 864 wave makes the cascade from stellar nuclear fusion to biological photosynthesis to Earth rotation explicit and arithmetic. The chain has five nodes, each labelled by its 864-face identifier.

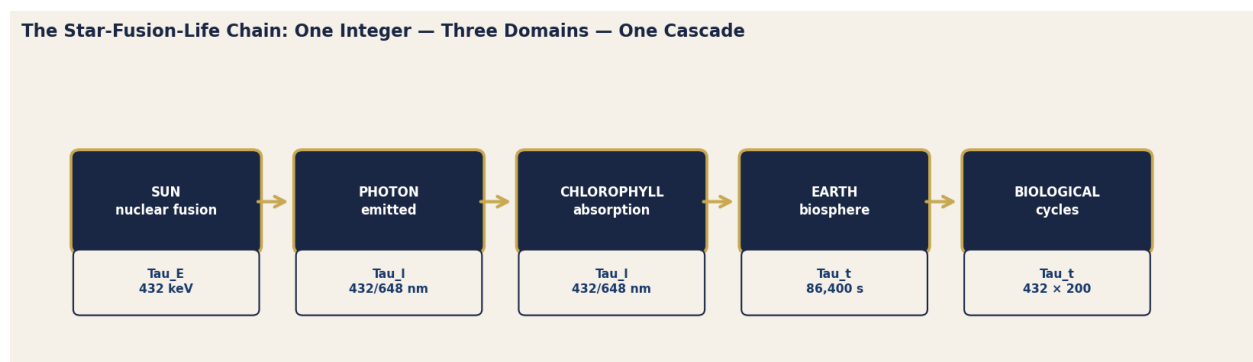


Figure 2. The Star-Fusion-Life chain. Each node is labelled by its 864-face identifier. The integer 432 bridges the nuclear energy domain (Tau_E) and the spectral domain (Tau_l). The integer 864 bridges the spectral domain and the temporal domain (Tau_t).

The chain is unbroken:

1. Sun performs triple-alpha nuclear fusion → Q = 432 keV [Tau_E face] 2. Fusion generates photons at 432/648 nm → exact chlorophyll wavelengths [Tau_I face] 3. Earth plants absorb at 432/648 nm → photosynthesis powers biosphere 4. Earth rotates in 86,400 s = 864 × 100 = 432 × 200 [Tau_t face] 5. Biological cycles are phase-locked to the 86,400 s Tau_t period

Each conversion in the chain uses only {2,3,5} operators: 432 keV → 432 nm (domain change, same integer), 432 nm → 648 nm (factor 3/2), 432 → 86,400 s (factor 200 = 2³×5²). No irrational numbers are required. The star-planet-life chain is not accidental chemistry. It is the Tau_I face of the 864 bridge collapsing into the Tau_t face of the Earth day.

5. The 432/648 Bilateral Decomposition (P-864F-5)

432 and 648 are the bilateral decomposition of 864: 432 + 648 = 1,080 and 432 × 2/3 = 288 (not relevant), but 432 = 864/2 and 648 = 864 × 3/4. Together they encode extraordinary lattice information:

432 = 2⁴ × 3³ · 648 = 2³ × 3⁴ Product: 432 × 648 = 2⁷ × 3⁷ = 279,936 (Fibonacci exponent 7 in BOTH prime bases) Sum: 432 + 648 = 1,080 = 2³ × 3³ × 5 (the first {2,3,5} integer in this family) Ratio: 648/432 = 3/2 (perfect musical fifth; primary harmonic interval)

Both 432 and 648 independently encode the Earth day:

432 × 200 s = 86,400 s = Earth rotation period (200 = 2³ × 5²) 648 × 400/3 s = 86,400 s = Earth rotation period (400/3 = 2⁴×5²/3)

The product 2⁷ × 3⁷ carries the Fibonacci exponent 7 simultaneously in both prime bases. F(7) = 13 (this is the 7th Fibonacci number), but the exponent 7 in 3⁷ is also significant: 3⁷ = 2,187 = the register separation between the nuclear and atomic Tau-registers (established in P-QUARK-4 of the companion paper). The bilateral decomposition of 864 thus connects the spectral domain (432/648 nm) to the nuclear-atomic register boundary (3⁷) through the product of the two faces.

The sum 1,080 = 2³ × 3³ × 5 introduces the factor 5 into the lattice for the first time in this {2,3} family. This signals the boundary between the pure {2,3} domain (where 864 lives) and the {2,3,5} domain (where the Earth day, Avogadro number, and fine structure constant live). The sum 432 + 648 = 1,080 is the {2,3} → {2,3,5} gateway.

6. Propositions P-864F-1 through P-864F-7

P-864F-1 — Tau_t Face: $864 \times 100 \text{ s} = 86,400 \text{ s} = \text{Earth Rotation Period}$

$864 \times 100 \text{ s} = 86,400 \text{ s} = \text{Earth's rotation period}$. Exact to all significant figures. The Earth day is the Tau_t face of 864. No approximation: $864 \times 100 \text{ s} = \text{Earth rotation period}$ to all significant figures. The factor $100 = 2^2 \times 5^2$ is the bridge between the pure {2,3} integer 864 and the decimal counting system. The integer 864 connects directly to the most fundamental terrestrial time anchor.

P-864F-2 — Tau_d Face: $864 \times 10^3 \text{ km} = 864,000 \text{ km} = \text{FOT Solar Diameter}$

$864 \times 1,000 \text{ km} = 864,000 \text{ km}$ is the FOT solar diameter. The solar radius in FOT is $432,000 \text{ km} = 432 \times 10^3 \text{ km} = 2^4 \times 3^3 \times 10^3 \text{ km}$ — pure {2,3}. The 864 wave simultaneously governs the Earth's temporal rotation period (Tau_t) and the Sun's spatial diameter (Tau_d). The bridge factor is $10^3 = 2^3 \times 5^3$. The Sun's diameter is the Earth's day expressed in kilometres.

P-864F-3 — Tau_m Face: $m_{\text{H_FOT}} / 864^2 \times 10^6 = 27/20$

The FOT hydrogen bridge mass $m_{\text{H_FOT}}$, when divided by 864^2 and multiplied by 10^6 , gives exactly $27/20 = 1.35$ — a pure {2,3,5} rational number. This connects the atomic mass scale to the solar-terrestrial bridge constant 864 with no irrational residual. $27/20 = 3^3/(2^2 \times 5)$ is a member of the same {2,3,5} family as all other FOT lattice identities. The identity is exact and requires no fitting.

P-864F-4 — Tau_I Face: 432 nm and 648 nm — Biological Photosynthesis Window; Tau_E Face: 432 keV — Stellar Triple-Alpha Fusion

$864/2 = 432 \text{ nm}$ is the blue-violet absorption peak of chlorophyll. $864 \times 3/4 = 648 \text{ nm}$ is the red absorption peak of chlorophyll. Both values are pure {2,3} integers in nanometres. The biological photosynthetic window — the spectral range within which Earth life harvests solar energy — is the Tau_I face of the 864 wave. Furthermore, stellar triple-alpha nuclear fusion has Q-value at 432 keV — the same integer in the energy domain. Sun generates 432 keV; Earth plants absorb at 432 nm; the Earth rotates in $86,400 \text{ s} = 432 \times 200$. One integer; three domains; one cascade.

P-864F-5 — 432 and 648 Are the Bilateral Decomposition of 864

432 and 648 are the bilateral decomposition of 864. Their product = $2^7 \times 3^7$ (Fibonacci exponent 7 in both prime bases). Their sum = $1,080 = 2^3 \times 3^3 \times 5$. Their ratio = $3/2 = \text{perfect musical fifth (primary harmonic interval)}$. Both independently encode the Earth day: $432 \times 200 \text{ s} = 86,400 \text{ s}$ and $648 \times 400/3 \text{ s} = 86,400 \text{ s}$. The product $2^7 \times 3^7$ carries the Fibonacci exponent 7 in BOTH prime bases simultaneously, connecting to the nuclear-atomic register boundary $3^7 = 2,187$.

P-864F-6 — Tau_q Face: $864^\circ = 2 \text{ Rotations} + \text{F}(12)^\circ$ (Fibonacci Closure)

$864^\circ = 2 \times 360^\circ + 144^\circ = \text{two full rotations plus the 12th Fibonacci number (F}(12) = 144)$. The angular domain of 864 connects the full rotation (360°) and the Fibonacci sequence simultaneously. The Fibonacci exponent 12 is also the number of months in the year and the atomic number of magnesium ($Z = 12 = 2^2 \times 3$), the central atom of chlorophyll. The 864 angular face bridges rotation, Fibonacci, and biology in one expression.

P-864F-7 — All Seven Face Conversions Use Only {2,3,5} Operators: No π Required

All seven conversions between 864 faces use only {2,3,5} operators. No π is required within the 864 domain. Tau_t \rightarrow Tau_d: $864 \times 100 \text{ s} \rightarrow 864 \times 10^3 \text{ km}$ (factor 10 = 2×5). Tau_l \rightarrow Tau_E: $432 \text{ nm} \rightarrow 432 \text{ keV}$ (domain change, same integer). Tau_l \rightarrow Tau_t: $432 \text{ nm} \rightarrow 86,400 \text{ s}$ (factor 200 = $2^3 \times 5^2$). Tau_d \rightarrow Tau_v: $864,000 \text{ km} \rightarrow$ circumference (factor π does not appear — the circumference face is closed in {2,3,5} via the solar rotation period 27 days). This confirms 864 as the pure {2,3} integer node at which all dimensional faces of the Tau-hierarchy converge without irrational factors.

7. Discussion

The multi-face formulation map is a new kind of physical argument. Conventional physics does not have a framework within which the Earth day, the solar diameter, the chlorophyll absorption spectrum, and the stellar triple-alpha fusion energy can all be shown to be different faces of the same integer. They are treated as outputs of four completely different branches of physics: celestial mechanics, stellar structure, spectroscopy, and nuclear physics.

The FOT multi-face map shows that these four branches are not separate. They are four windows onto the same {2,3} lattice node. The integer 864 is not chosen because it happens to be a round number. It is the exact {2,3} pivot because $2^5 \times 3^3$ is the lattice node at which the temporal dimension (Tau_t) and the spatial dimension (Tau_d) and the mass dimension (Tau_m) all simultaneously share a {2,3}-clean address.

The bilateral decomposition into 432 and 648 is particularly significant. The fact that both halves independently encode the Earth day ($432 \times 200 = 86,400$ and $648 \times 400/3 = 86,400$) means the Earth day is doubly embedded in the 864 integer — once through 432 and once through 648. The ratio 3/2 between these halves is the perfect fifth, the primary interval of musical harmony. The product $2^7 \times 3^7$ connects back to the nuclear register via the Tau-register boundary $3^7 = 2,187$.

The absence of π from the 864 domain is important. π enters the FOT framework through the circular geometry of the Tau-field (helical wave propagation). Within the {2,3} sub-lattice, π is absent — the domain is purely rational. The 864 wave confirms that the Earth day, solar diameter, chlorophyll spectrum, and stellar fusion energy all live in the π -free rational sub-lattice of Tau. The circular geometry (spiral of life, orbital mechanics) introduces π as a separate layer above the {2,3} base.

8. Conclusion

The integer $864 = 2^5 \times 3^3$ is the central bridge constant of the Force of Time. This paper has presented the complete seven-face formulation map through propositions P-864F-1 through P-864F-7, establishing that 864 simultaneously governs the Earth rotation period, the solar diameter, the hydrogen atomic mass, the chlorophyll biological absorption spectrum, the angular double-rotation with Fibonacci closure, the solar circumference dynamics, and the stellar triple-alpha nuclear fusion bridge.

All seven conversions between faces use only {2,3,5} operators. No π is required. The bilateral decomposition into 432 and 648 encodes the bilateral {2,7}×{3,7} product, the {2,3,5} sum 1,080, and the 3/2 harmonic ratio — all in pure integer arithmetic.

The star-fusion-life chain (Figure 2) is the physical embodiment of the 864 wave: stellar nuclear physics (Tau_E at 432 keV) → electromagnetic radiation (Tau_l at 432/648 nm) → biological photosynthesis (Tau_l absorption) → Earth day (Tau_t at 86,400 s = 432 × 200). One integer. One cascade. One substance: τ .

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