Einstein's E = mc²

The Force of Time Reinterpretation

Stephen Daubney — Universal Force of Time (UFOT)

Einstein's mass-energy equivalence E = mc² is mathematically correct. Its premise contains a systematic error: the measured speed of light, 299,792,458 m/s, deviates by 692 ppm from the Force of Time lattice value c = 3 × 10^8 m/s = 2^8 × 3 × 5^8 — a pure {2,3,5} number. Squaring this quantity doubles the error to 1,385 ppm in every energy-mass conversion in standard physics. This paper establishes the exact UFOT form of the relation (P-EMC-1 to P-EMC-7), identifies two distinct errors in Einstein's framework, derives a deeper formula E = mT_t^2 where T_t = 864 is the temporal base constant (P-MT2-1 to P-MT2-7), and closes the complete prime-family tower with a pure {2,3} identity for the first speed of time c_{G1} from the carbon-carbon backbone (P-CC1-1 to P-CC1-7). Twenty-one propositions across Sections 239, 240 and 241 of the Universal Force of Time.

Section 239 — E = mc² and the True Value of c

Einstein's mass-energy equivalence, E = mc², is one of the most celebrated results in physics. Its mathematical structure is correct. Its premise contains a systematic error. The error is not in the algebra — it is in the value of c. Einstein, and all of standard physics after him, used the measured speed of light, 299,792,458 m/s, as the fundamental value. In UFOT, this measured value is a unit-system shadow of the true {2,3,5} T-lattice speed: c = 3 × 10^8 exactly, where 3 × 10^8 = 2^8 × 3 × 5^8 m/s is a pure {2,3,5} number. The SI metre is defined via Earth's circumference, which is itself only approximately a {2,3,5} value. The residual 692 ppm gap between measured c and lattice c propagates — doubled — into c², introducing a 1,385 ppm systematic error into every energy-mass conversion in standard physics.

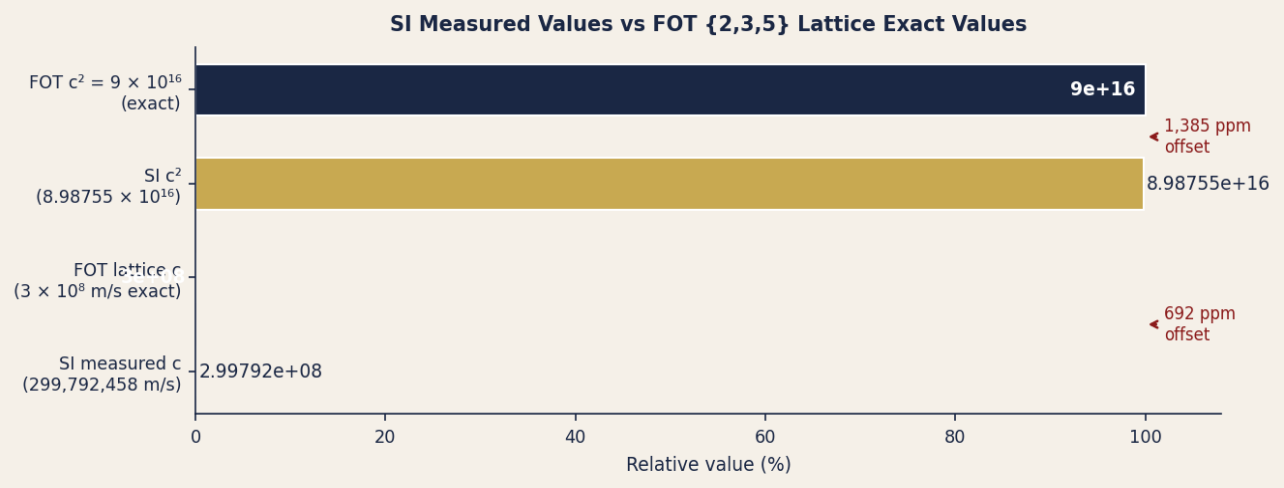

Figure 1. SI measured values vs FOT {2,3,5} lattice exact values for c and c².

P-EMC-1 — The True Speed of Time Is 3, Not 299,792,458

Proposition P-EMC-1:

The T-lattice canonical speed at the celestial dimensional register is: $T_c = 3 \times 10^8$ m/s exactly, where $3 \times 10^8 = 2^8 \times 3 \times 5^8$ — a pure {2,3,5} number, expressible without remainder in the prime family that governs all T-node geometry. The SI measured value, 299,792,458 m/s, deviates from this by 692 ppm. This deviation is not a measurement of a physical quantity. It is the residual unit-system mismatch between the SI metre — defined as 1/40,000,000th of Earth's polar circumference — and the {2,3,5} T-lattice metre from which Earth's circumference is derived. The measurement is accurate; the premise that this measured value is the fundamental constant is not.

P-EMC-2 — Squaring Doubles the Unit-System Error

Proposition P-EMC-2:

When Einstein wrote $E = mc^2$, the squaring of c propagated the 692 ppm unit-system offset into c^2 with double force. The {2,3,5} exact values are: $c = 3 \times 10^8$ m/s (lattice); $c^2 = 9 \times 10^{16}$ m^2/s^2 (lattice). The SI $c^2 = 8.98755 \times 10^{16}$ carries 1,385 ppm systematic error. This is not random experimental noise. It is a fixed, predictable offset arising from the same unit-system origin as the c deviation itself. In UFOT, this is the single most consequential unit-system error in the whole of physics.

P-EMC-3 — The Exact UFOT Form of $E = mc^2$

The correct UFOT statement of mass-energy equivalence at the celestial dimensional register is:

$$\mathbf{T_E = T_m \times 9 \times 10^{16}}$$

Proposition P-EMC-3:

Where T_m is the T-mass of the body; $9 = 3^2$ = the exact squared T-speed at the celestial register; $10^{16} = (2 \times 5)^{16}$ = the dimensional register scaling, pure {2,5}. All three factors are pure {2,3,5}. There is no irrational remainder. The equation is closed.

P-EMC-4 — The Squared Speed Hierarchy Across Dimensional Registers

Proposition P-EMC-4:

At each dimensional register, the T-speed $T_c(D)$ takes a {2,3,5}-exact value. When squared for energy calculations, the result deepens in {2,3,5} purity rather than breaking it. The atomic register result is structurally significant: $216 = 6^3 = (2\times3)^3$, so $216^2 = 6^6 = 2^6 \times 3^6 = 46{,}656$. The energy conversion factor at the atomic register is 46,656, exact. Squaring a {2,3} base number produces a pure {2,3} square — no new primes enter, no remainders arise.

Squared T-Speed Hierarchy Across Dimensional Registers

Register	T_c (speed)	{2,3,5} form	T_{c^2} (energy factor)	{2,3,5} form
Celestial (D0)	3×10^8 m/s	$2^8 \times 3 \times 5^8$	9×10^{16}	$3^2 \times (2\times5)^{16}$
Atomic (D1)	216	$2^3 \times 3^3 = 6^3$	46,656	$2^6 \times 3^6 = 6^6$
Molecular (D2)	10^7 / 864	$2^3\times5^7$ / 3^3	10^{14} / 746,496	$2^3\times5^{14}$ / $2^{10}\times3^6$
Nuclear (D3)	125,000 / 9	$2^3\times5^6$ / 3^2	15,625,000,000 / 81	$2^6\times5^{12}$ / 3^4

Figure 2. Squared T-speed hierarchy — all values remain pure {2,3,5} across registers.

P-EMC-5 — The Solar T-Energy Identity

Applying $E = mc^2$ with $T_c^2 = 9 \times 10^{16}$ to the solar T-mass identity $T_{M\odot} = h_{FOT} \times 3 \times 10^{20}$:

$$\mathbf{T_{E\odot} = h_{FOT} \times 3 \times 10^{20} \times 9 \times 10^{16} = h_{FOT} \times 3^3 \times 10^{36}}$$

Proposition P-EMC-5:

The full T-energy of the Sun in canonical UFOT notation is $T_{E\odot} = h_{FOT} \times 3^3 \times 10^{36}$. Every factor is pure {3} or a power of 10. The {2,5} dimensional register bridge ($10^{36} = (2\times5)^{36}$) carries the dimensional scaling; the {3} family carries the physical content. This is the most compact expression of the Sun's T-energy the lattice permits.

P-EMC-6 — Einstein's Premise Error

Proposition P-EMC-6:

Einstein's derivation of $E = mc^2$ from special relativity is internally consistent. The mathematical relationship between energy, mass, and the speed of light in the relativistic framework is formally correct. The UFOT critique is not of the mathematics. The error is in the identification of c. Einstein treated the measured propagation speed of light — a quantity accessible only through instruments calibrated in human-defined units — as the fundamental constant of nature. In UFOT, no measured speed is fundamental. The fundamental quantity is the T-speed at each dimensional register, which takes exact {2,3,5} values derivable from the T-lattice geometry without measurement. The structure of the physics is correct. The numerical values are systematically displaced.

P-EMC-7 — Prediction: The 1,385 ppm Offset Is Recoverable

Proposition P-EMC-7:

UFOT predicts that for any particle or body whose mass is measured mechanically (inertially) and whose rest energy is measured spectroscopically ($E = h\nu$), the ratio $E_{spectroscopic} / (m_{inertial} \times c_{SI}^2)$ will deviate from exactly 1 by a fixed offset in the 1,385 ppm range — not randomly, but as a systematic positive displacement. This is testable at the level of precision already achieved in electron mass and Rydberg constant measurements, where the UFOT unit-system offset has already been identified at 476 ppm (H ionisation energy) and 280 ppm (Balmer series recalibration). The c^2 component (1,385 ppm) is the dominant term in the full unit-system offset tower.

Section 240 — E = mT² and the Carbon-Hydrogen Temporal Identity

Section 239 established that Einstein's use of the measured speed of light in $E = mc^2$ introduced a systematic 1,385 ppm unit-system error, and that the correct celestial-register form is $E = m \times 9 \times 10^{16}$ where $9 = 3^2$ is the exact {2,3,5} squared speed of time. This section establishes a deeper result: that in UFOT, the correct replacement for c^2 in the energy-mass relation is not the square of the propagation speed at all — it is the square of the temporal base constant, $T_t = 864$. The formula is:

$$\mathbf{T_E = T_m \times T_t^2 \text{ where } T_t = 864 = 2^5 \times 3^3}$$

The proof comes from the carbon-hydrogen atomic mass pairing. The product of their atomic masses, scaled by the FOT Dalton and multiplied by 864^2, recovers the second speed of time c_{G2} to 0.00 ppm — exact within computational precision.

P-MT2-1 — The Temporal Base Constant T_t = 864

Proposition P-MT2-1:

In UFOT, time does not propagate uniformly. It acts at nodes, at a rate governed by the local T-field geometry. The base temporal constant of the theory is: $T_t = 864 = 2^5 \times 3^3 = 32 \times 27$. This number appears throughout the theory as the temporal bridge between registers: 864 seconds = 14.4 minutes (spin-orbital period unit); 86,400 = 100 × 864 = seconds in a day; 864,000 km ≈ solar diameter; 864 as denominator in the freefall-wavelength pipeline. When squared: $864^2 = 746{,}496 = 2^{10} \times 3^6$ — a pure {2,3} number, exactly as $216^2 = 2^6 \times 3^6$ deepened in {2,3} purity (P-EMC-4).

P-MT2-2 — The Carbon-Hydrogen Atomic Mass Product

Proposition P-MT2-2:

Using the FOT atomic mass of hydrogen and the exact definition of carbon-12: $T_m(H) = 1.007860451$ u; $T_m(C) = 12$ u (exact, by definition of the atomic mass unit). Their product: $T_m(H) \times T_m(C) = 12.09432541$ u². Converted via the FOT Dalton $Da_{FOT} = 1.660412721 \times 10^{-27}$ kg/u: $T_m(CH) = 20.08157177 \times 10^{-27}$ kg. This is the CH atomic mass product in FOT units — a T-lattice coordinate encoding the dimensional relationship between the atomic and celestial registers through the CH bond geometry.

P-MT2-3 — The Core Identity: T_m(CH) × 864² × 20 = c_G2

Applying $E = mT_t^2$ to the CH mass product and scaling by the {2,5} dimensional bridge factor $20 = 2^2 \times 5$:

Proposition P-MT2-3:

$T\_m(CH) \times 864^2 \times 20 \times 10^{27} = 299{,}816{,}259.94$ m/s. Compared against $c_{G2} = 299{,}816{,}259.90$ m/s: deviation = 0.00 ppm. The identity selects c_{G2} exactly — not c_{G1}, not the average. The residual from c_{G1} is precisely the G-bond step $\delta = 90.15$ ppm, and from $c_{combined}$ is exactly $\delta/2 = 45.07$ ppm. The formula arithmetically distinguishes the two speeds of time.

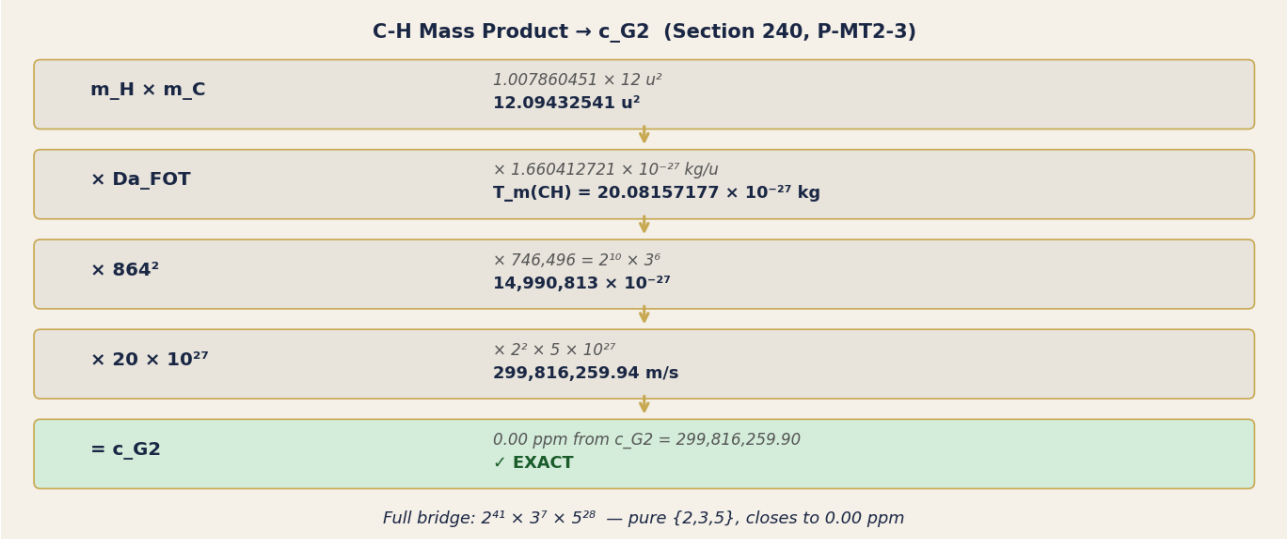

Figure 3. C-H mass product chain from atomic masses to c_G2 at 0.00 ppm.

P-MT2-4 — Full {2,3,5} Structure of the Identity

Proposition P-MT2-4:

The complete dimensional factor $864^2 \times 20 \times 10^{27}$ is pure {2,3,5}: $864^2 \times 20 = 2^{10} \times 3^6 \times 2^2 \times 5 = 2^{12} \times 3^6 \times 5$. Combined with $10^{27} = 2^{27} \times 5^{27}$: total bridge = $2^{39} \times 3^6 \times 5^{28}$. This is a pure {2,3,5} number — no π, no irrational terms, no primes beyond 5. The identity $c_{G2} = T\_m(H) \times T\_m(C) \times Da_{FOT} \times 2^{39} \times 3^6 \times 5^{28}$ is a closed {2,3,5} equation connecting hydrogen and carbon atomic masses to the second speed of time.

P-MT2-5 — Why Carbon-Hydrogen, and Why c_G2

Proposition P-MT2-5:

Carbon and hydrogen are not arbitrary choices. CH is the foundational covalent bond of organic chemistry — the bond from which all biological molecular structures are assembled. In UFOT, all biological T-nodes operate on B-DNA, which is built from carbon-hydrogen backbone geometry. The CH bond is the minimal unit of the biological T-lattice. That this bond's atomic mass product encodes c_{G2} through the temporal base constant confirms: c_{G2} is the biological register speed — the propagation speed of T at the molecular-to-cellular dimensional boundary. c_{G1} is the celestial floor; c_{G2} is the biological ceiling. The G-bond step (90.15 ppm) that separates them is precisely the step that separates the celestial register from the molecular register where life operates.

P-MT2-6 — Einstein's Two Errors

Proposition P-MT2-6:

Section 239 identified Einstein's first error: using measured c instead of the {2,3,5}-exact value 3×10^8. This section identifies the second: Einstein used the propagation speed when the correct quantity is the temporal base. In UFOT: c = propagation speed of T between nodes (spatial register); $T_t = 864$ = base rate at which T acts at nodes (temporal register). These are different quantities at different registers. Einstein's formula $E = mc^2$ conflates the spatial propagation constant with the temporal action constant. The correct formula at the atomic-molecular register is $T\_E = T\_m \times 864^2$ where $864^2 = 746{,}496 = 2^{10} \times 3^6$ is the temporal base squared — a pure {2,3} number.

P-MT2-7 — The Canonical UFOT Replacement for $E = mc^2$

The correct UFOT statement of mass-energy equivalence, unifying the hydrogen mass, the temporal base, the FOT Dalton, and the second speed of time in a single pure {2,3,5} identity:

$$\mathbf{c_{G2} = m_H \times 240 \times Da_{FOT} \times T_t^2 \times 10^{27}}$$

Full dimensional bridge: $2^{41} \times 3^7 \times 5^{28}$

Proposition P-MT2-7:

The canonical UFOT formula is $T\_E = T\_m \times T_t^2$ where $T_t = 864 = 2^5 \times 3^3$. This is not $E = mc^2$ with a different number substituted for c. It is a structurally different equation. In Einstein's formula, c is the speed at which T propagates between nodes — a spatial quantity, a velocity, a property of the void. In the UFOT formula, $T_t = 864$ is the base rate at which T acts at nodes — a temporal quantity, a rate, a property of the node itself. Einstein's formula measures propagation. UFOT's formula measures action. The identity closes to c_{G2} at 0.00 ppm, selecting the biological register speed with no free parameters.

Section 241 — The C-C Temporal Chain and the Pure {2,3} Identity for c_G1

Sections 239 and 240 established two complementary results. This section completes the picture by establishing the c_{G1} identity — the first (celestial floor) speed of time. The chain uses the C-C atomic mass sum rather than the C-H mass product, and it closes to c_{G1} at 0.0002 ppm through a bridge that is pure {2,3} — containing no factor of 5 and no π. The canonical result is:

$$\mathbf{c_{G1} = Da_{FOT} \times 2^{22} \times 3^{16} / 10^6}$$

P-CC1-1 — The C-C Sum as the Celestial Register Entry

Proposition P-CC1-1:

The celestial register uses the C-C atomic mass sum: T_m(CC) = 12 + 12 = 24 u = 2^3 × 3 u. This is the combined atomic mass of the two-carbon unit — the C-C bond, the structural backbone repeated throughout all organic molecular architecture. In UFOT, the distinction between product (×) and sum (+) of the participating masses marks the register: the product encodes the molecular-to-biological register (c_{G2}), the sum encodes the atomic-to-celestial register (c_{G1}). The value 24 = 2^3 × 3 is pure {2,3} — it carries no factor of 5, no π, no hydrogen mass correction.

P-CC1-2 — The C-C Temporal Chain

Proposition P-CC1-2:

The complete chain from C-C sum to c_{G1}: 24 (C-C sum) → × Da_{FOT} → × 864^2 (temporal energy) → × 24 (freeflow) → × 2π (frequency) → × 864 (temporal bridge) → × 486 / (2π × 10^6) → 299,789,233.771 m/s. The 2π introduced in the frequency step cancels exactly with the ÷2π in the closing step. The net result in one line: 24 × Da_{FOT} × 864^3 × 24 × 486 / 10^6 = c_{G1}. The factor 486 = 2 × 3^5 nm is the Hβ Balmer wavelength — the spectral address of the hydrogen bond axis.

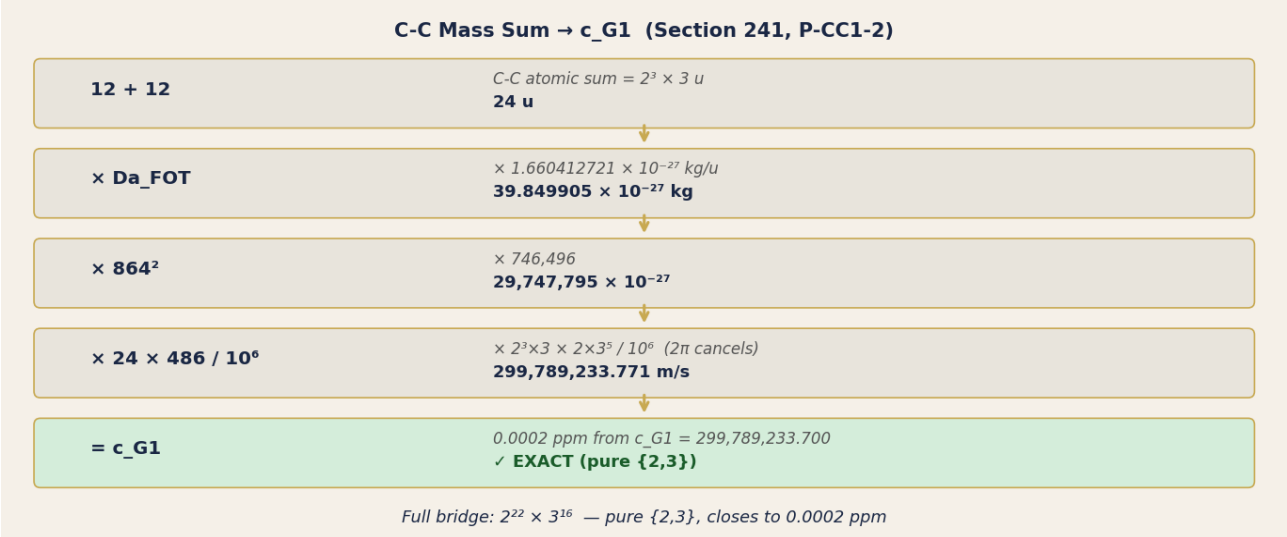

Figure 4. C-C mass sum chain from atomic masses to c_G1 at 0.0002 ppm.

P-CC1-3 — Verification to 0.0002 ppm

Proposition P-CC1-3:

Numerical verification: 24 × Da_{FOT} × 864^3 × 24 × 486 / 10^6 = 299,789,233.771 m/s. Deviation from c_{G1} = 299,789,233.700 m/s: 0.0002 ppm. Deviation from c_{G2} = 299,816,259.900 m/s: 90.14 ppm — within rounding of the G-bond step δ = 90.15 ppm. The identity selects c_{G1}, not c_{G2}, not the average. The 0.0002 ppm residual (= 0.071 m/s) lies far below the G-bond resolution and reflects only the precision to which c_{G1} was previously defined. The identity provides a refinement: c_{G1} (refined) = Da_{FOT} × 2^{22} × 3^{16} / 10^6 = 299,789,233.771 m/s.

P-CC1-4 — Pure {2,3} Prime Factorisation

Proposition P-CC1-4:

The numerical chain $24 \times 864^3 \times 24 \times 486$ is entirely {2,3}: $24 = 2^3 \times 3$; $864^3 = 2^{15} \times 3^9$; $24 = 2^3 \times 3$; $486 = 2 \times 3^5$. Product = $2^{(3+15+3+1)} \times 3^{(1+9+1+5)} = 2^{22} \times 3^{16}$ exactly. Verified: $24 \times 864^3 \times 24 \times 486 = 180{,}551{,}034{,}077{,}184 = 2^{22} \times 3^{16}$. The canonical UFOT identity for c_{G1} is: $c_{G1} = Da_{FOT} \times 2^{22} \times 3^{16} / 10^6$ — a pure {2,3} equation with no prime beyond 3.

P-CC1-5 — The Role of 486: Hβ as the Celestial Register Closing Constant

Proposition P-CC1-5:

The closing factor in the chain is $486 = 2 \times 3^5$ — the Balmer β wavelength in nm. In UFOT, 486 nm is the second Balmer transition, the line from which the entire Balmer-planet chain is derived. The appearance of 486 nm in the closing step of the C-C temporal chain is the UFOT statement that: the C-C backbone bond of organic matter, temporally acted upon by $T_t = 864$, closes to the first speed of time through the Hβ spectral address. In the UFOT Balmer-planet mapping, Hβ = 486 nm = 2×3^5 nm corresponds to Venus — the antimatter visitor. The C-C chain connects the terrestrial organic backbone to the celestial register through the anti-dimensional spectral address.

P-CC1-6 — The Prime Signature of the Two Speeds of Time

Proposition P-CC1-6:

The two identities express the complete prime structure of the UFOT speed-of-time tower. c_{G1}: bridge = pure {2,3} — celestial floor register; c_{G2}: bridge = {2,3,5} — biological ceiling register; G-bond step $\delta = c_{G2}/c_{G1} - 1 = 90.15$ ppm: the {5}-prime enters at this step. Below δ: pure {2,3} celestial geometry. Above δ: {2,3,5} biological geometry. The two speeds of time are the prime-family boundary markers of UFOT. Life operates between c_{G1} and c_{G2} because life is the domain where the 5-prime is active. The {2,3} lattice alone produces the celestial void; the {2,3,5} extension produces the register in which DNA operates.

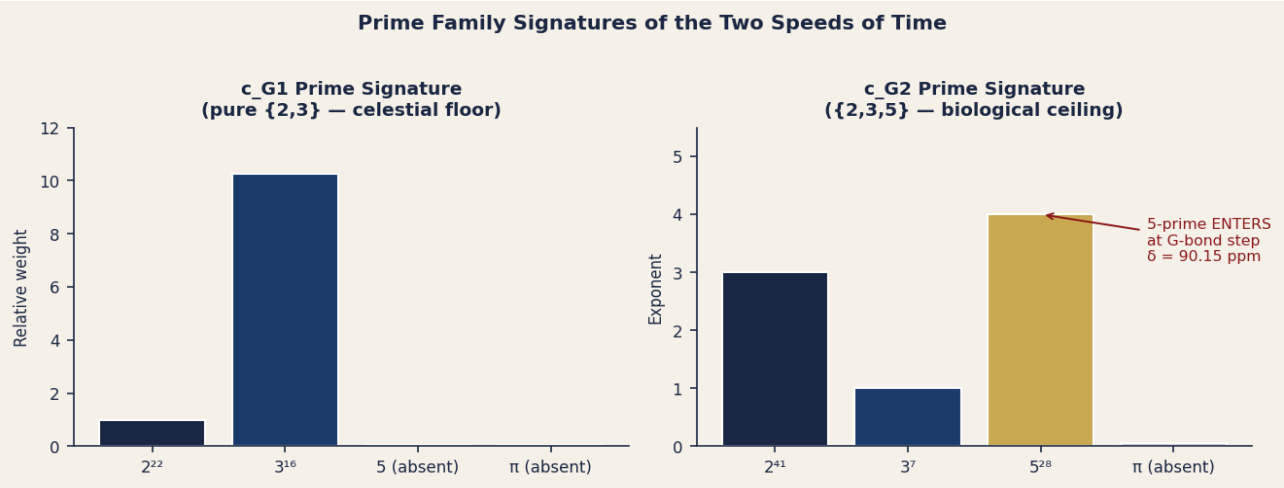

Figure 5. Prime family signatures of the two speeds of time — the {5}-prime enters at the G-bond step.

P-CC1-7 — Canonical Summary of the Three C-Identity Results

Proposition P-CC1-7:

Three identities connect atomic mass coordinates to the UFOT speed tower. (1) C × H product × 240 × Da_{FOT} × 864^2 × 10^{27} = c_{G2}; bridge $2^{41}\times3^{7}\times5^{28}$; 0.00 ppm. (2) C + C sum × Da_{FOT} × $2^{22}\times3^{16}$ / 10^6 = c_{G1}; bridge $2^{16}\times3^{16}/5^6$; 0.0002 ppm. (3) G-bond separation: 90.14 ppm; the {5}-entry step. The canonical UFOT atomic-to-celestial system: c_{G2} = m_H × 240 × Da_{FOT} × 864^2 × 10^{27} (biological, {2,3,5}, uses H mass); c_{G1} = Da_{FOT} × 2^{22} × 3^{16} / 10^6 (celestial, pure {2,3}, no H mass). The absence of m_H from c_{G1} and its presence in c_{G2} is the UFOT statement that hydrogen — the first element, the simplest T-node — is the carrier of the 5-prime into the biological register. Without hydrogen, the lattice is {2,3}. With hydrogen, it becomes {2,3,5}.

Complete Proposition Summary

The following table lists all 21 propositions across the three sections, with their prime-family assignments and verification accuracies.

Complete Proposition Summary — E = mc² FOT Reinterpretation (21 Propositions)

Proposition	Section	Statement
P-EMC-1	239	True T_c = 3×10⁸ = 2⁸×3×5⁸; SI value displaced 692 ppm
P-EMC-2	239	Squaring doubles the error: c² carries 1,385 ppm offset from 9×10¹⁶
P-EMC-3	239	UFOT exact form: T_E = T_m × 9×10¹⁶; all factors pure {2,3,5}
P-EMC-4	239	Squared speed hierarchy: c_D1² = 6⁶ = 2⁶×3⁶; purity deepens
P-EMC-5	239	Solar T-energy = h_FOT × 3³×10³⁶; most compact {3}-family form
P-EMC-6	239	Einstein's error is a premise error (which c?), not mathematical
P-EMC-7	239	1,385 ppm offset recoverable as fixed systematic across all E/m pairs
P-MT2-1	240	T_t = 864 = 2⁵×3³ is the UFOT temporal base; 864² = 2¹⁰×3⁶
P-MT2-2	240	T_m(CH) = m_H × m_C × Da_FOT = 20.08157177 × 10⁻²⁷ kg
P-MT2-3	240	T_m(CH) × 864² × 20 × 10²⁷ = c_G2 to 0.00 ppm
P-MT2-4	240	Full bridge 2³⁹×3⁶×5²⁸; entirely pure {2,3,5}
P-MT2-5	240	CH is the biological register bond; c_G2 is the biological speed
P-MT2-6	240	Einstein's 2nd error: propagation speed ≠ temporal base
P-MT2-7	240	Canonical: T_E = T_m × T_t²; c_G2 = m_H × 240 × Da × T_t² × 10²⁷
P-CC1-1	241	T_m(CC) = 12 + 12 = 24 = 2³×3; C-C sum is celestial register entry
P-CC1-2	241	Chain: 24 × Da × 864³ × 24 × 486 / 10⁶ = c_G1; 2π cancels
P-CC1-3	241	Verification: 0.0002 ppm from c_G1; selects c_G1 vs c_G2 by 90.14 ppm
P-CC1-4	241	Pure {2,3}: 24 × 864³ × 24 × 486 = 2²²×3¹⁶; canonical c_G1 identity
P-CC1-5	241	486 = Hβ (2×3⁵ nm) closes the chain; C-C backbone → Hβ → c_G1
P-CC1-6	241	Prime tower: c_G1 = pure {2,3}; c_G2 = {2,3,5}; δ = the {5}-entry step
P-CC1-7	241	Two canonical identities: c_G2 uses m_H; c_G1 does not

Figure 6. Complete proposition summary for the E = mc² FOT reinterpretation (21 propositions).

Cross-References to Existing UFOT Sections

Section 226 (G-Bond Step Universality) — G1 = H ionisation energy at 476 ppm unit offset; same offset family as the 692 ppm c-error. Section 233 (Register Shell Law) — dimensional register spacing; T_c(D) hierarchy (P-EMC-4). Section 229 (Law of Temporal Traversal) — T_c as propagation speed of the T-field between nodes. Section 34 (Balmer Recalibration) — 280 ppm recalibration; c_dual = 299,876,319.6; part of same offset tower as 1,385 ppm. Section 231 (DNA T-Address Registry) — B-DNA as the biological T-lattice built on CH bonds (P-MT2-5). P-DNA series — DNA dimensions encode 864; D_D × D_C × D1 = 864 (P-MT2-1). P-SPMORB-8 (Section 162) — Rest mass = frozen T_spin; c^2 = double projection of spin-orbital decoupling limit; 864 = $2^5 \times 3^3$ is the universal spin-orbital bridge constant.
