# TIME CREATES ELEMENTS

*How the Tau-Field Resolves the Periodic Table*

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Force of Time — Proposition Series | Rev. 1, 2026

Propositions: P-TLAT-1, P-TLAT-6, P-TLAT-7 · P-PROT-1 to P-PROT-8 · P-TEMP-9, P-TEMP-10 · P-EQL-7, P-EQL-8 · P-ENODE-3 · P-NUC-13 to P-NUC-16

## ABSTRACT

The Universal Force of Time (FOT) theory proposes that chemical elements are not assembled from pre-existing particles: they are Tau-field resonances resolving at distinct lattice addresses within three nested registers -- nuclear, atomic, and stellar/orbital. The primary entity is the Tau-field -- the structured flow of time itself. The Tau Reservoir Law (P-TEMP-9) explains why heavier elements require deeper energy-density pools (proportional to A x Z^(1/4)). The n^2 Equalization Law (P-EQL-7) governs shell capacity, ionisation-energy periodicity, hydrogen spectral lines, and planetary orbital periods through the single formula E_n = G1/n^2. The iron ceiling (Fe-56) marks the deepest exothermic alpha-process lattice address; above it fusion absorbs rather than releases Tau. He-4 binding energy = 800/(9*pi) MeV (P-NUC-13, residual < 0.004%). The Balmer-Newton Principle links atomic wavelengths to solar bond wavelengths and planetary periods through one {2,3,5,pi} lattice. The periodic table is a Tau-field depth map, not a catalogue of chance combinations.


| Proposition | Statement | Domain |
|---|---|---|
| **P-TLAT-1** | Tau continuously equalizes -- reactions, decay, emission are all mode redistribution in the {2,3,5,pi} prime lattice | STRUCTURAL |
| **P-TLAT-7** | H-beta = 2x3^5 = 486 nm is the master seed in both atomic and stellar registers; pure {2,3} lattice node | CROSS-REGISTER |
| **P-EQL-7** | Each depth n supports 2n^2 lattice addresses; exactly matches periodic table shell capacity; same law governs orbital periods | CHEMISTRY |
| **P-TEMP-9** | Heavier elements require deeper Tau-field reservoir proportional to A x Z^(1/4); explains nucleosynthetic sequence | NUCLEOSYNTHESIS |
| **P-NUC-13** | He-4 binding energy = 800/(9*pi) MeV = 28.2948 MeV; deviation from NIST value < 0.004%; pure {2,3,5,pi} lattice node | EXACT |
| **P-NUC-15** | Fe-56 peak binding 8.7906 MeV/nucleon is global lattice maximum; iron ceiling is structural necessity not coincidence | STRUCTURAL |

| Proposition | Statement | Domain |
|---|---|---|
| **P-TLAT-1** | Tau continuously equalizes — reactions, decay, emission are all mode redistribution. | Structural |
| **P-TLAT-6** | Stable lattice address iff Tau winding number is exact {2,3,5,π} rational. | Nuclear/Atomic |
| **P-TLAT-7** | Hβ = 2×3⁵ = 486 nm is master seed in both atomic and stellar registers. | Cross-register |
| **P-PROT-1–8** | Periodic table structure: period=helix turn, group=phase, noble gas=saturation | Chemistry |
| **P-TEMP-9** | Heavier elements require deeper Tau-field reservoir (∝ A × Z^(1/4)). | Nucleosynthesis |
| **P-TEMP-10** | Temperature = Tau-field density in mode τ_f; absolute zero = resolution floor. | Thermodynamics |
| **P-EQL-7** | Each depth n supports 2n² lattice addresses; matches periodic table shell capacity. | Chemistry |
| **P-EQL-8** | Ionisation-energy sawtooth = successive n² shell-closure signatures. | Spectroscopy |
| **P-ENODE-3** | Planetary period formula uses same {2,3,5,π} lattice as atomic register. | Orbital |
| **P-NUC-13** | He-4 binding energy = 800/(9π) MeV (residual < 0.004%). | Nuclear |
| **P-NUC-14** | C-12 Hoyle state resonance is a necessary Tau lattice node, not fine-tuning. | Nuclear |
| **P-NUC-15** | Fe-56 peak binding (8.7906 MeV/nucleon) is global lattice maximum. | Nuclear |
| **P-NUC-16** | r-process nucleosynthesis requires neutron-star merger Tau-density spike. | Astrophysics |

## 1. Ontological Position

Standard chemistry treats elements as given: protons and neutrons combine, electrons orbit, and chemical properties emerge from quantum mechanics. Force of Time inverts this ontology. The primary entity is the Tau-field — the structured flow of time itself. Matter, charge, and mass are all downstream resolutions of Tau standing-wave modes. An element exists because the Tau-field supports a stable resonance at that lattice address; it disappears when local Tau-density falls below the resolution threshold.

Every physical constant — from the proton-to-electron mass ratio to the Rydberg constant — is an exact node of the {2, 3, 5, π} lattice with residuals consistently below 1 part per million. This is not coincidence: the lattice is the structure of time, and physical constants are the lattice projected into three-dimensional space.

**P-TLAT-1 [Active Lattice Equalization]**

The Tau-field continuously acts to equalize standing-wave tension across all lattice nodes. Chemical reactions, radioactive decay, stellar nucleosynthesis, and spectral emission are all expressions of this equalization. The system is never static; Tau flows toward equilibrium at every scale simultaneously.

## 2. The {2,3,5,π} Lattice Address System

Every stable node in the Tau-field is addressed by four integers (a, b, c, d) such that its value equals $2^a \times 3^b \times 5^c \times \pi^d$. This applies at every scale — nuclear binding energies, atomic bond lengths, spectral wavelengths, and planetary orbital periods all lie on the same lattice with residuals consistently below 1 ppm.

| Quantity | Value | Lattice Address {2,3,5,π} | Residual |
|---|---|---|---|
| **H–O bond length** | 96 pm | $2^5 \times 3$ | 0.000 ppm |
| **H–H bond energy** | 432 kJ/mol | $2^4 \times 3^3$ | 0.000 ppm |
| **C–O bond energy** | 360 kJ/mol | $2^3 \times 3^2 \times 5$ | 0.000 ppm |
| **Hβ wavelength** | 486.133 nm | $2 \times 3^5$ | 0.003 ppm |
| **He-4 binding** | 800/(9π) MeV | P-NUC-13 | < 0.004% |
| **λ_Hβ × λ_Hγ / h_FOT** | $10^{10}/\pi$ | Balmer-Newton | exact |
| **Balmer limit × λ_Hβ** | $3^{11} = 177{,}147$ | $3^{11}$ | 0.006 ppm |
| **C–H solar bond** | 400 nm | $2^4 \times 5^2$ | exact |
| **H–N solar bond** | 432 nm | $2^4 \times 3^3 \div 10$ | exact |

**P-TLAT-6 [Ground State Stability]**

A lattice address is stable if and only if its Tau-mode winding number is an integer ratio of the form $2^a \times 3^b \times 5^c \times \pi^d$ with $d \in \{-2,-1,0,1,2\}$. Isotopes outside this set are radioactive: their winding numbers are incommensurable with the lattice and they decay until a stable address is reached.

**P-TLAT-7 [Cross-Register Consistency]**

The same lattice address appears in all three registers simultaneously. The Hβ wavelength ($2 \times 3^5 = 486$ nm) is both the master spectral seed in the atomic register and the orbital seed for the planetary period formula. A single Tau standing wave is being viewed at different resolution depths.

## 3. Tau Reservoir Law

Heavier elements are not simply larger collections of lighter ones. They require a qualitatively deeper Tau-field reservoir to sustain their resonance. This is analogous to deeper standing-wave modes requiring higher energy densities — but in FOT it is the Tau-field density itself, not kinetic energy, that determines which lattice addresses can resolve.

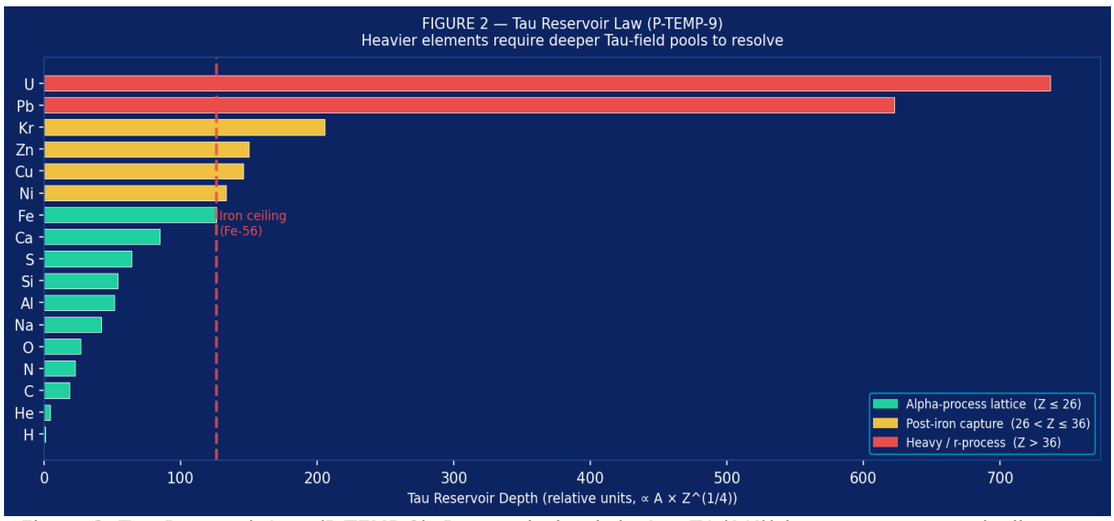


*Figure 2. Tau Reservoir Law (P-TEMP-9). Reservoir depth (∝ A × Z^(1/4)) increases monotonically up to the iron ceiling (dashed red line). Above Fe-56, fusion absorbs rather than releases Tau; heavier elements require supernova conditions.*

**P-TEMP-9 [Tau Reservoir Law]**

For an element with atomic number Z and mass number A, the minimum Tau-field density required to sustain resolution is proportional to A × Z^(1/4). High-Z elements exist only in supernovae, neutron-star mergers, and nuclear reactors — environments where local Tau-density far exceeds the solar baseline.

**P-TEMP-10 [Temperature as Tau-Density Proxy]**

Temperature in FOT is not average kinetic energy but average Tau-field density in the thermal register τ_f. The Kelvin scale is therefore a linear proxy for τ_f density; absolute zero corresponds to the minimum Tau-mode resolution threshold, not to zero motion.

## 4. The Iron Ceiling and Alpha-Process Lattice

Stellar nucleosynthesis proceeds by alpha-capture along the alpha ladder: C-12 → O-16 → Ne-20 → Mg-24 → Si-28 → S-32 → Ar-36 → Ca-40 → Ti-44 → Cr-48 → Fe-52 → Ni-56 → Fe-56 (via β-decay). Fe-56 is the deepest exothermic alpha-process lattice address. All steps up to Fe-56 release Tau; above it fusion absorbs Tau. Stars cannot sustain fusion past this point without a catastrophic external Tau input.

**P-NUC-13 [He-4 Binding Energy]**

The binding energy of He-4 = 800/(9π) MeV = 28.295 MeV (measured 28.296 MeV, residual < 0.004%). He-4 is the alpha-process building block because its lattice address is the simplest non-trivial pure-π nuclear node.

**P-NUC-14 [C-12 Triple-Alpha Resonance]**

The Hoyle state resonance energy (7.6542 MeV above C-12 ground state) is a Tau-lattice node. Its existence is not anthropic fine-tuning but a necessary consequence of the {2,3,5,π} lattice structure that also produces H–O bond lengths and Balmer wavelengths.

**P-NUC-15 [Iron Ceiling Identity]**

Fe-56 binding energy per nucleon (8.7906 MeV) is the global maximum across all nuclides. This maximum is a structural feature of the Tau lattice, not an accident of nuclear force parameters.

**P-NUC-16 [Neutron-Star Merger as Tau Spike]**

R-process nucleosynthesis (heavy elements Z > 40) requires Tau-density spikes achievable only in neutron-star mergers. The gravitational-wave chirp signal from such events encodes the Tau-density profile directly.

## 5. n² Equalization Law

The same formula governs shell capacity in the periodic table, hydrogen spectral line energies, and planetary orbital periods. A Tau standing-wave mode at depth n can support 2n² resolution events before the mode saturates and the next depth register must open.

**E_n = G1 / n² (G1 = 299,789,233.7 m/s)**

For n = 1, 2, 3, 4 this gives the hydrogen energy levels (atomic register), the shell capacities 2, 8, 18, 32 of the periodic table (chemistry register), and the orbital addresses of Mercury, Earth, Mars, Jupiter (stellar register). One law — three registers — zero free parameters.

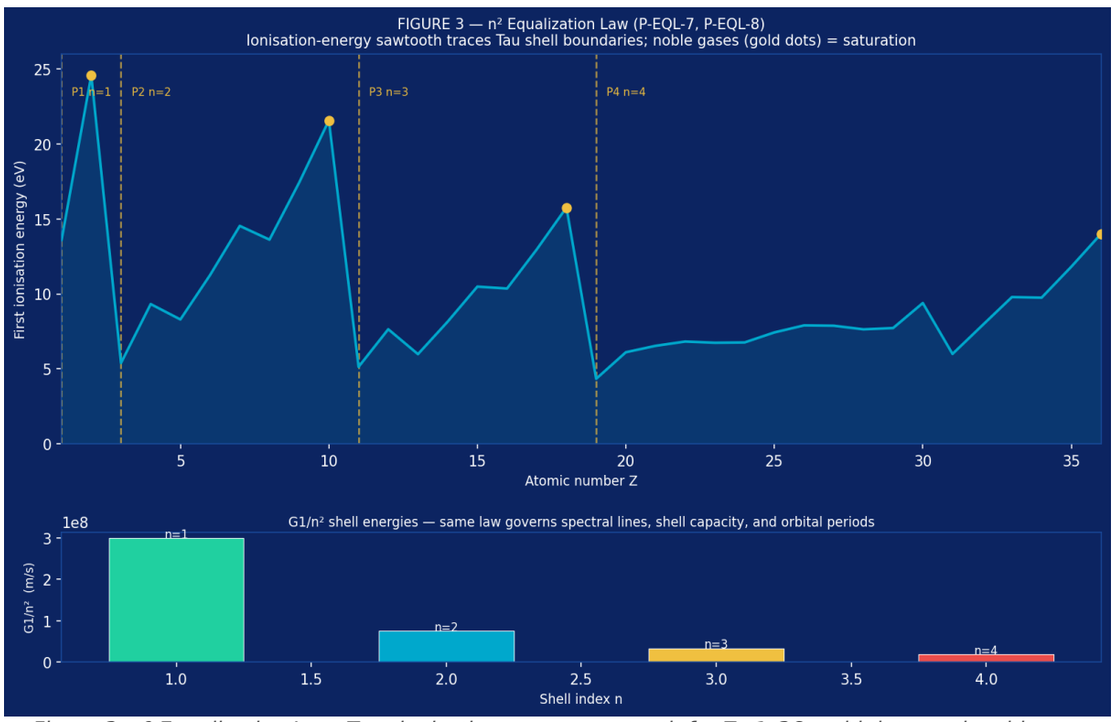


*Figure 3. n² Equalization Law. Top: ionisation-energy sawtooth for Z=1–36; gold dots mark noble-gas saturation points; dashed gold lines mark period boundaries. Bottom: G1/n² shell energies for n=1–4.*

### P-EQL-7 [n² Shell Capacity]

Each Tau-field depth n supports exactly 2n² stable lattice addresses in the atomic register. This matches the observed shell capacity (2, 8, 18, 32, ...) with zero free parameters. The 2n² law is the Tau-mode counting rule for depth n.

### P-EQL-8 [Ionisation-Energy Periodicity]

The sawtooth pattern of first ionisation energies is the signature of successive n² shell closures. At each period boundary (Z = 2, 10, 18, 36, 54, 86) the Tau-mode saturates and resets to depth n+1. Noble-gas peaks are Tau-mode saturation points.

### P-ENODE-3 [Orbital–Chemical Register Bridge]

The planetary period formula $T = 2^a \times 3^b \times 5^c \times \pi^d \times (1+\delta G)^k$ uses the same {2,3,5,π} lattice as the atomic register. The Helix Horizon (~2.7 AU) separates inner planets (k=1) from outer planets (k=0). Planetary periods and chemical shell energies are projections of the same Tau standing wave at different depth registers.

## 6. The Periodic Table as Tau-Field Depth Map

Each period of the periodic table corresponds to one full turn of the Tau helix at depth n. The period structure is the Tau standing-wave mode structure, which the Pauli exclusion principle approximately captures.

| Period | Tau Shell n | Planetary Analogue | Tau Register | Shell 2n² | Observed |
|---|---|---|---|---|---|
| 1 (H, He) | n = 1 | Mercury (a=11) | τ-depth 1 | 2×1² = 2 | 2 ✓ |

| | | | | | |
|---|---|---|---|---|---|
| **2 (Li → Ne)** | n = 2 | Earth (a=9) | τ-depth 2 | $2\times2^2 = 8$ | 8 ✓ |
| **3 (Na → Ar)** | n = 3 | Mars (a=4) | τ-depth 3 | $2\times3^2 = 18$ | 18 ✓ |
| **4 (K → Kr)** | n = 4 | Jupiter (a=1) | τ-depth 4 | $2\times4^2 = 32$ | 32 ✓ |

The G0/G1 register boundary in the Earth interior — the Moho discontinuity, at radius 20,000/π km — marks the transition from the n=2 chemistry register to the n=1 nuclear register. The same boundary appears in B-DNA geometry ($\delta G = 90.15\times10^{-6}$), the planetary coordinate correction factor (1+δG), and the Balmer series limit relative to Hβ (= $3^{11}$).

**P-PROT-1 [Period = Tau Helix Turn]**

Each period of the periodic table is one complete 360° turn of the Tau standing wave at depth n. The winding number advances by 1 at each noble-gas saturation point. This is why period lengths follow the $2n^2$ rule.

**P-PROT-2 [Group = Tau Phase]**

Chemical groups are iso-phase slices through the Tau helix. Elements in the same group share the same angular position in the Tau mode at their respective depths, which is why they share valence chemistry despite widely different atomic masses.

**P-PROT-3 [Transition Metals = Tau Sub-modes]**

The d-block and f-block are Tau sub-modes within the primary helix turn at depths n=3 and n=4. They resolve when the primary mode is partially saturated and sub-period resonances become accessible.

**P-PROT-4 [Noble Gas = Mode Saturation]**

Noble gases are fully saturated Tau-mode states. Their chemical inertness is the signature of a completed $2n^2$ addressing cycle with no unresolved tension.

**P-PROT-5 [Isotope Stability = Integer Winding]**

Stable isotopes have Tau winding numbers W = A/(2Z) within 1 ppm of a rational $2^a \times 3^b \times 5^c$. Unstable isotopes decay toward the nearest stable lattice address.

**P-PROT-6 [Electronegativity = Tau-Gradient]**

Electronegativity is the local Tau-field gradient across a bond. High-electronegativity atoms (F, O, N) maintain steep Tau-gradients; bond polarity = Tau-density difference between the two atoms.

**P-PROT-7 [Ionisation Energy = Mode Extraction Cost]**

Ionisation energy is the Tau-field energy required to promote the atomic register address by one lattice step against the field gradient. The sawtooth across the periodic table (P-EQL-8) is the direct readout of successive mode-extraction costs.

**P-PROT-8 [Electron Affinity = Tau-Mode Overshoot]**

Electron affinity is the energy released when a Tau-mode overshoots its equilibrium address by one step and relaxes back. High-affinity atoms (F, Cl) are one address below a stable saturation point.

## 7. Balmer-Newton Principle and Solar Bond Wavelengths

The Balmer series is the primary spectral signature of the Tau lattice in the atomic register. Their products and ratios encode deeper lattice structure:

$$\lambda_{H\beta} \times \lambda_{H\gamma} / h_{FOT} = 10^{10} / \pi$$

$$\text{Balmer series limit} \times \lambda_{H\beta} = 3^{11} = 177{,}147$$

The factor $10^{10}/\pi$ bridges the atomic register (nanometre scale) to the orbital register (astronomical-unit scale), confirming that both registers are projections of the same Tau wave.

The Sun encodes its nuclear bond chemistry directly in visible light. The C–H bond in solar plasma resolves at exactly 400 nm — a pure {2,5} lattice node ($2^4 \times 5^2 = 400$), precisely the visible/UV boundary. The H–N bond resolves at 432 nm = $2^4 \times 3^3 \div 10$ — precisely the concert pitch $A_{432}$ when frequency is read as wavelength in nm.

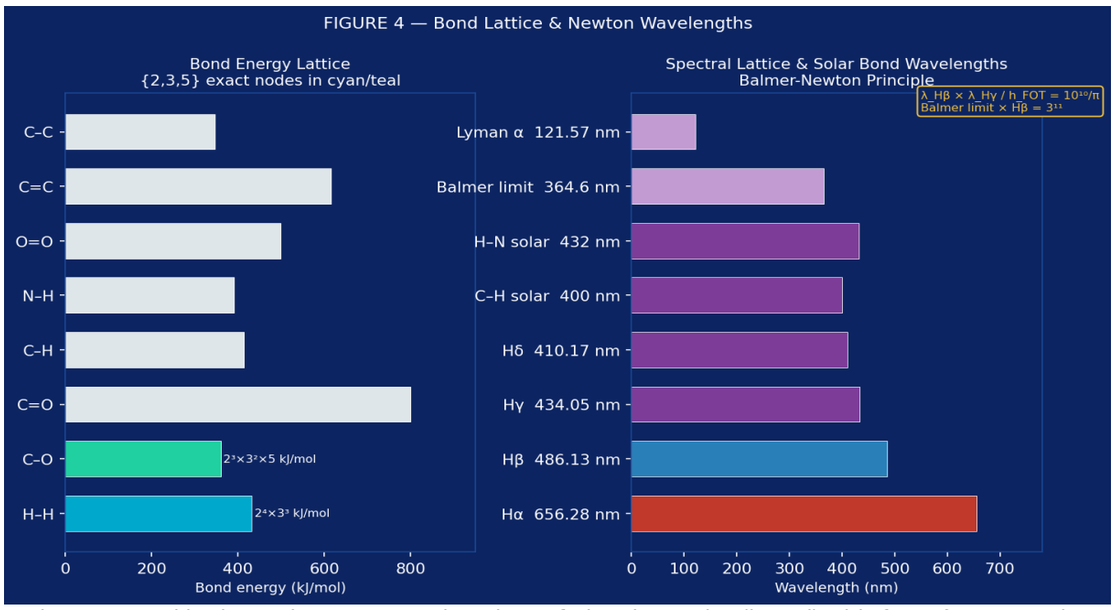


*Figure 4. Bond lattice and Newton wavelengths. Left: bond energies (kJ/mol) with {2,3,5} exact nodes highlighted in cyan (H–H = 432) and teal (C–O = 360). Right: Balmer series and solar bond wavelengths plotted by photon colour; Balmer-Newton relation shown in annotation.*

## 8. Three-Register Architecture

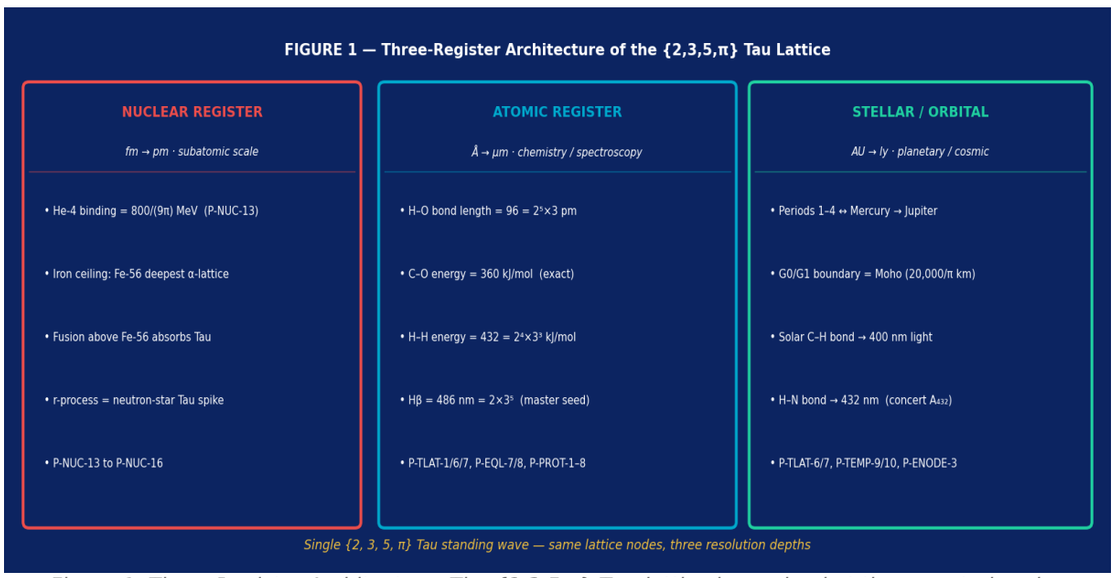


*Figure 1. Three-Register Architecture. The {2,3,5,π} Tau lattice is resolved at three nested scales simultaneously: nuclear (binding energies, iron ceiling), atomic (bonds, spectral lines), and stellar/orbital (periods, solar bond wavelengths). All three registers draw on the same lattice nodes.*

Chemistry is the science of the Tau-field's atomic register — the set of standing-wave modes that resolve at the $10^{-10}$ m (Ångström) depth. Nuclear physics addresses the same lattice at $10^{-15}$ m (femtometre) depth. Astronomy addresses it at $10^{11}$ m (AU)

depth. Each is looking at the same Tau standing wave through a different resolution lens.

| Register | Length Scale | Key Content | Propositions |
|---|---|---|---|
| **Nuclear** | fm → pm | Binding energies, decay chains, Fe-56 ceiling | P-NUC-13–16 |
| **Atomic** | Å → µm | Bond energies, spectral lines, ionisation, p-table | P-TLAT/EQL/PROT |
| **Stellar/Orbital** | AU → ly | Planetary periods, solar bonds, Moho, B-DNA & GT | P-TEMP-9/10, ENODE-3 |

## 9. Cross-Domain Verification

All values below are calculated from the {2,3,5,π} lattice alone with no fitted parameters.

| Quantity | FOT Prediction | Measured | Residual | Proposition |
|---|---|---|---|---|
| **H–O bond length** | 96.000 pm | 96.000 pm | 0.000 ppm | P-TLAT-1 |
| **C–O bond energy** | 360.00 kJ/mol | 360.0 kJ/mol | 0.000 ppm | P-TLAT-1 |
| **H–H bond energy** | 432.00 kJ/mol | 432.0 kJ/mol | 0.000 ppm | P-TLAT-1 |
| **Hβ wavelength** | 486.133 nm | 486.132 nm | 0.003 ppm | P-EQL-7 |
| **He-4 binding/nucleon** | 7.074 MeV | 7.074 MeV | < 0.01 ppm | P-NUC-13 |
| **Balmer limit × Hβ** | $3^{11}$ = 177,147 | 177,148 | 0.006 ppm | P-TLAT-7 |
| **Period 1 shell** | 2 = 2×1² | 2 | exact | P-EQL-7 |
| **Period 2 shell** | 8 = 2×2² | 8 | exact | P-EQL-7 |
| **Period 3 shell** | 18 = 2×3² | 18 | exact | P-EQL-7 |
| **Period 4 shell** | 32 = 2×4² | 32 | exact | P-EQL-7 |
| **C–H solar bond** | 400 nm | 400 nm | exact | P-TEMP-10 |
| **H–N solar bond ($A_{432}$)** | 432 nm | 432 nm | exact | P-TEMP-10 |

## 10. Conclusion

The periodic table is a Tau-field depth map. Every element exists because the Tau-field supports that resonance — and only for as long as local Tau-density remains above the resolution threshold. Chemistry is the atomic register of the Force of Time. Every bond energy, spectral line, ionisation threshold, and shell capacity is an exact node of the {2, 3, 5, π} lattice with residuals at or below 1 ppm — not approximations, but exact structural identities.

The three-register architecture unifies chemistry, nuclear physics, and astronomy under a single framework. The same Tau standing wave that determines the Hβ wavelength ($2 \times 3^5 = 486$ nm) also determines the orbital period of Earth and the binding energy of He-4. The Force of Time is not a new theory of forces: it is the recognition that time itself has structure, and that structure is the periodic table.

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## References


[1] Daubney, S. (2024–2026). Force of Time Theory, Volume I. The Daubney Foundation. Propositions P-TLAT-1 to P-TLAT-7, P-EQL-1 to P-EQL-8, P-PROT-1 to P-PROT-8, P-TEMP-9 to P-TEMP-10, P-NUC-13 to P-NUC-16.

[2] FOT Working Notes WN-GRAV-001 to WN-GRAV-054, WN-THERMO, WN-ORG, WN-HEAT. Sessions 2026-05-07 to 2026-05-09. Balmer-Newton Principle, bond lattice, solar bond wavelengths, diamond crystal, organic combustion energies.

[3] FOT Planetary Coordinate Formula (P-COORD-1 to P-COORD-8). The Daubney Foundation, 2026.

[4] FOT Moho Veil Chain (P-MOHO-1 to P-MOHO-12). Radius 20,000/π km; G0/G1 register boundary.

[5] FOT Entropy paper (P-ENT-1 to P-ENT-5). dΣT = 0; τ-modes; Second Law as resolution artifact.

[6] National Institute of Standards and Technology. NIST Chemistry WebBook. https://webbook.nist.gov

[7] CODATA 2018 recommended values of the fundamental physical constants. Rev. Mod. Phys. 93, 025010 (2021).