

# The Periodic Table as a T-Coordinate Map

*The Universal Force of Time*

*The periodic table is not a list of chemical elements. It is a coordinate map of the T-field — each element assigned its position by the same prime lattice  $\{2, 3, 5, \pi\}$  that governs atomic spectra, planetary orbits, and the geometry of DNA. Period lengths, block capacities, atomic numbers, and shell capacities are all exact expressions from the  $\{2, 3\}$  sub-lattice. The elements did not evolve into this arrangement. The arrangement is the only one the T-field permits.*

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P-CHEM-1

## Scale Invariance: The Same Lattice from Atom to Galaxy

*The Force of Time operates through one conservation law —  $d\Sigma T = 0$  — expressed through one prime lattice:  $\{2, 3, 5, \pi\}$ . This lattice produces the hydrogen spectral series, the planetary orbital structure, the galactic double helix, and the periodic table. Period lengths 2, 8, 18, 32 are  $2^1, 2^3, 2 \times 3^2, 2^5$  — pure products of the two simplest primes. Block capacities 2, 6, 10, 14 =  $\{2, 3, 5, 7\}$  — one term from each prime in sequence.*

**P-CHEM-1: The periodic table is the sub-atomic register of the T-field. Period lengths 2, 8, 18, 32 =  $2^1, 2^3, 2 \times 3^2, 2^5$  (pure  $\{2,3\}$  sub-lattice). Block capacities 2, 6, 10, 14 = prime escalation  $\{2, 3, 5, 7\}$ .**

Same law:  $d\Sigma T = 0$ . Same lattice:  $\{2, 3, 5, \pi\}$ . Scale invariant from quark to galaxy.

## Planetary Register Assignments

*Each period of the periodic table corresponds to a planetary node in the solar T-field. The hydrogen spectral series already encodes planetary distances. The s-block of Period 1 is the Mercury register. Period 2 is Earth. The d-block transition metals are the Venus nuclear domain. The f-block is the prime-7 boundary. Mercury appears twice: at Period 1 (1s Fibonacci crossing) and as the universal first-p seeder in Group 13 of every period.*

Period / Block	Node	FOT Mechanism	Elements
Period 1 — s-block	Mercury	1s Fibonacci crossing (n=1, Balmer base)	H, He
Period 2 — s,p-block	Earth	2s node — p-corridor opens at n=2	Li → Ne
Period 3 — s,p-block	Mars	3s node — second p-corridor	Na → Ar
Period 4 — s,d,p-block	Jupiter	4s node — d-block opens (Venus domain)	K → Kr
Period 5 — s,d,p-block	Saturn	5s node — second d-row	Rb → Xe
Period 6 — s,f,d,p	Uranus	6s node — f-block opens (prime-7 boundary)	Cs → Rn
Period 7 — s,f,d,p	Neptune	7s node — second f-row	Fr → Og
d-block (all)	Venus nuclear	Prime-5: 10 near-degenerate slots	Groups 3-12
f-block (all)	Prime-7 boundary	f-block capacity 14 = prime-7 lattice step	Lanthanides, Actinides

P-CHEM-2: Each period = one planetary T-register. Mercury = 1s. Venus = d-block (prime-5, 10 slots). Earth = p-corridor. f-block = prime-7 boundary. The solar system and the periodic table are the same coordinate map at different scales.

One T-field. Seven planetary registers. 118 elements.

## Period Lengths: Pure {2, 3} Sub-Lattice

*The number of elements in each period is determined entirely by the two smallest prime numbers. The sequence 2, 8, 18, 32 is  $2^1, 2^3, 2 \times 3^2, 2^5$  — a pure {2, 3} escalation. Each length appears twice (periods 2&3 both 8; periods 4&5 both 18; periods 6&7 both 32) because the T-field double helix has two strands, each traversing the same register node from opposite T-chirality.*

Period	Length	Lattice Expression	Quantum Form
1	2	$2^1 = 2$	$1s^2$
2	8	$2^3 = 8$	$2s^2 2p^6$
3	8	$2^3 = 8$ (Strand 2 crossing)	$3s^2 3p^6$
4	18	$2 \times 3^2 = 18$	$4s^2 3d^{10} 4p^6$
5	18	$2 \times 3^2 = 18$ (Strand 2 crossing)	$5s^2 4d^{10} 5p^6$
6	32	$2^5 = 32$	$6s^2 4f^{14} 5d^{10} 6p^6$
7	32	$2^5 = 32$ (Strand 2 crossing)	$7s^2 5f^{14} 6d^{10} 7p^6$

P-CHEM-3: Period lengths 2, 8, 18, 32 =  $2^1, 2^3, 2 \times 3^2, 2^5$ . Pure {2, 3} sub-lattice. Each length appears twice: once per T-helix strand.  $2n^2$  is the quantum formula. {2, 3} is the lattice behind it.

No primes beyond 3 required to derive the entire row-length structure.

P-CHEM-4

## Block Capacities: Prime Escalation {2, 3, 5, 7}

The four blocks — s, p, d, f — have capacities 2, 6, 10, 14 =  $2 \times \{1, 3, 5, 7\}$ . The factor of 2 is the spin degeneracy (Pauli exclusion = no two T-nodes at the same lattice position). The odd factor {1, 3, 5, 7} is the prime escalation: one value for each prime in sequence  $p = 2, 3, 5, 7$ . Four blocks. Four primes. One lattice.

Block	Capacity	Expression	Prime	Physical Meaning
s-block	2	$2 \times 1$	$p=2$	Spin pair — the minimal T-node (up/down)
p-block	6	$2 \times 3$	$p=3$	Three spatial axes $\times$ spin pair
d-block	10	$2 \times 5$	$p=5$	Venus nuclear domain — five d-orbital pairs
f-block	14	$2 \times 7$	$p=7$	Prime-7 boundary — seven f-orbital pairs

P-CHEM-4: Block capacities 2, 6, 10, 14 =  $2 \times \{1, 3, 5, 7\}$ . Pauli exclusion = no two T-nodes at the same lattice position: a consequence of  $d\Sigma T = 0$ . The odd factor is the prime escalation:  $p = 2, 3, 5, 7$ .

Four blocks. Four primes. One lattice.

P-CHEM-5

## Z = T-Floors: The Ontological Claim

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Atomic number  $Z$  is the count of dimensional floors in the nuclear  $T$ -sphere. There is one proton, one neutron, one electron. What varies across the 118 elements is not the number of distinct particles but the number of times the same  $T$ -particle appears at each register level. Shell capacities 2, 8, 18, 32 are the number of appearances of the single  $T$ -electron at each dimensional floor.

*In the FOT framework there is one proton, one neutron, and one electron. The periodic table does not catalogue 118 different kinds of matter. It catalogues 118 different counts of dimensional floors in the nuclear  $T$ -sphere — 118 different configurations of the same one substance,  $T$ , at different register depths. The diversity of matter is the register diversity of one substance.*

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P-CHEM-5:  $Z$  = count of  $T$ -floors in the nuclear  $T$ -sphere. Shell capacities 2, 8, 18, 32 = appearances of the single  $T$ -electron at each register level. One proton, one neutron, one electron — 118 register configurations of  $T$ .

The diversity of matter is the register diversity of one substance:  $T$ .

P-CHEM-6

## The Hydrogen Identity and the Master Seed

Hydrogen at  $Z=1$  is the master seed of the  $T$ -field cascade. The Balmer beta line at  $486 \text{ nm} = 2 \times 3^5 \text{ nm}$  is the single spectral constant from which freefall  $g = 9.8122 \text{ m s}^{-2}$ , the speed of light  $c_{G1} = 299,789,233.7 \text{ m s}^{-1}$ , the water bond angle  $18/\pi^2 \text{ radians} = 104.4950^\circ$ , and the Earth day  $86,400 \text{ s}$  are all derived. The periodic table radiates outward from this one node via the prime cascade.

Hydrogen Line	FOT Derivation	Physical Constants Encoded
H-alpha 656 nm	Balmer $n=3 \rightarrow 2$	$n=3 \rightarrow 2$ orbital energy level
H-beta 486 nm	$2 \times 3^5 \text{ nm}$ (exact)	$g$ , $c$ , water bond angle, Earth day 86,400 s
H-gamma 434 nm	Balmer $n=5 \rightarrow 2$	$n=5 \rightarrow 2$ transition
H-delta 410 nm	Balmer $n=6 \rightarrow 2$	Solar cycle connection
Lyman- $\alpha$ 121 nm	UV boundary node	Ionisation register

P-CHEM-6: Hydrogen at  $Z=1$  is the master seed of the  $T$ -field. H-beta =  $2 \times 3^5 \text{ nm}$  encodes  $g$ ,  $c$ , water geometry, and the Earth day 86,400 s. The periodic table radiates outward from this single node via the prime cascade.

One element. One spectral line. The entire physical world.

