The Periodic Table on the Helix

Every Energy Level a Time-Equalized Turn · Every Shape a Rung of the Odd Ladder 1, 3, 5, 7 · the f-Block the Prime-7 Wall

One radial helix whose rungs are the electron energy levels of every element (scaled by Z^2), crossed with one angular odd ladder whose counts are the orbital shapes — and a single prime, seven, that walls the f-block, paints Mars, and stops the stars at iron

Stephen Daubney · The Daubney Foundation · Rev 3 · 2026
thedaubneyfoundation@gmail.com

Tau (T) is the living fabric of time itself — the sole substance of which all physical reality is composed. Every particle, force, wavelength, and conscious experience is a structured configuration of T-flow. There is no gravity, no electromagnetic force, no strong nuclear force as separate entities: all are registers of the single T-field operating across dimensional levels. The conservation law $d\Sigma T=0$ governs all change: T is never created or destroyed, only redistributed.

Abstract

The periodic table is the most reproduced diagram in science, and conventional chemistry reads it as a bookkeeping chart — rows for shells, columns for valence, four lettered blocks (s, p, d, f) whose shapes are solved one differential equation at a time. This paper shows it is something far simpler and far stranger: **two lattices crossed**. The first is radial — a single helical staircase, rooted in the Earth-day operator **$864 = 2^5\times3^3$** and climbing by the fixed step **$r = 5^6/(2^6\times3^5)$** — whose rungs are the **electron energy levels of every element at once**. Hydrogen's levels are the turns; every other element is the same turns scaled by **Z^2**: the fixed-node ionization energy is **$IE = G1\cdot Z^2$** with **$G1 = 13.6048896$ eV $(= 3^{12}\times2^8\times10^{-7})$**, pure {2,3}. The familiar **$1/n^2$** fan of levels is only the un-equalized appearance; apply the time-equalization operator **n^2** and every level of every atom folds onto its own register **$Z^2\cdot G1$** — the clustering is the fingerprint of equalization, not a coincidence. The second lattice is angular — the orbital shapes. The number of orbitals in each block is the **odd ladder 1, 3, 5, 7**; the capacities are **$2, 6, 10, 14 = 2\times\{1,3,5,7\}$**; and the prime **7 enters the table exactly at the f-block**, the first number outside the {2,3,5} lattice. That single fact explains the f-block's whole character. The locking angle of each shape is **360/(positions)**: s and p lock at **90°**, d at **72°** — both whole-number tilings of the {2,3,5} circle ($360 = 2^3\times3^2\times5$) — and f at **$360/7 = 51.428571°$**, the first angle that cannot tile it, because seven does not divide 360. The non-closure *is* the prime-7 wall written as an angle, and it is why the f-block is the unstable, ill-fitting, radioactive corner of chemistry. Read as planets, the blocks are the inner solar system itself — **s · spin · p · d · f = Sun · Mercury · Venus · Earth · Mars**, each block admitting the same prime as its world, the seven arriving at the f-block and at Mars together, exactly as it stops the stars at iron (Fe-56 = $2^3\times7$). Spin up and spin down are the **two strands** of the double helix — matter and antimatter — and **g = 2** is that doubling; 'three up, three down' in a p-shell is three angular seats counted on two strands. Aufbau, the building-up of shells, is the electron face of the nuclear alpha-ladder: core and shells descend through time in lockstep, charge-coupled. And the whole ladder stands on **turn 0, the proton**: its mass is a single lattice value, **$m_p = 9375\cdot\sqrt{(10^{11}/\pi)} = 1.672616359\times10^{-27}$ kg**, whose square **$m_p^2 = \alpha\cdot5^{13}\cdot\pi\cdot10^{11}$** carries the same $\alpha = 9/(125\pi^2)$ that fixes the 13.6 eV seed; the proton stands on the ground speed of light itself, **$c_{G0} = 3\times10^8$ m/s**, with the neutron one rung below at **299 894 598 m/s** and a mass of **$1.674927408\times10^{-27}$ kg** (0.054 ppm), the two bridged by the hydrogen Balmer-β line. Every figure here is at full precision; the table you memorised in school is a map of one helix and one prime.

I. The most familiar diagram in science, never truly seen

Every schoolroom has it on the wall. The periodic table — a hundred and eighteen tiles, arranged in rows and columns, coloured into four blocks the textbooks label s, p, d and f. Chemistry teaches it as a kind of filing cabinet: the rows are shells, the columns are families that react alike, and the strange shapes of the orbitals — the round s, the dumbbell p, the cloverleaf d, the many-lobed f — are each solved, one at a time, by grinding a wave equation. It works. It is also, the Force of Time will argue here, a profound missing of the point. The table is not a chart that had to be discovered tile by tile. It is the picture of **two simple lattices laid across each other** — and once you see them, the whole thing, levels, shapes, blocks, spin and all, falls out of arithmetic a child could check.

II. Every element's levels are hydrogen's turns, scaled by Z^2

Start with the one lattice this body of work has already built: a single helical staircase, its ground floor the Earth-day operator **$864 = 2^5 \times 3^3$**, climbing by the fixed step **$r = 5^6/(2^6 \times 3^5) = 1.004693930041$**. In the companion papers, hydrogen's energy levels were shown to *be* the rungs of that stair. The claim of this paper begins with a piece of plain commonsense: if hydrogen's levels are the turns, then so are every other element's — because there is only one staircase. And the dial that sets which register an element rides is a single number, **Z^2**, the square of its atomic number.

Here is the law, and it could not be cleaner. The energy that holds the innermost, fixed-node electron of element Z — its fully-stripped ionization energy — is **$IE = G1 \cdot Z^2$**, where **$G1 = 13.6048896\ eV\ (= 3^{12} \times 2^8 \times 10^{-7})$** is hydrogen's own ionization register, a pure product of twos and threes. Helium (Z=2) gives **54.4195584 eV (= G1×4)**; lithium **122.4440064 eV (= G1×9)**; carbon **489.7760256 eV (= G1×36)**; neon **1360.48896 eV (= G1×100)**. Set these beside the measured ionization energies (Table 1, Fig. 2) and the agreement is at the parts-per-million level — and the small residual drift is itself meaningful, as Section XII will show. One register, one element; the turns are universal, Z^2 is the only dial.

And each element's *own* ladder of levels time-equalizes the same way hydrogen's does. Read as physics draws them, the levels of any atom fan out as **$1/n^2$**. Multiply each by **n^2** — the time-equalization operator — and they all fold onto the single register **$Z^2 \cdot G1$** (Fig. 2, right). The fan is the veil; the fold is the truth. Every electron level of every element is one helical turn, seen before equalization.

III. The second axis — the shapes are the odd ladder 1, 3, 5, 7

The principal number n — which turn — is the radial axis. But an electron needs a second address: its **shape**, the angular number l, the thing the letters s, p, d, f stand for (l = 0, 1, 2, 3). This is a second, independent lattice axis, and it runs on the simplest ladder there is — the **odd numbers** (Fig. 3, Table 2). The count of orbitals in a shape is **$2l+1 = 1, 3, 5, 7$**: one s, three p, five d, seven f. Give each its two spin states and the capacities are **$2, 6, 10, 14 = 2 \times \{1, 3, 5, 7\}$**. The round s holds 2, the dumbbell p holds 6, the cloverleaf d holds 10, the seven-lobed f holds 14. The shapes were never a mystery to be solved equation by equation; they are the rungs of the odd ladder, made visible.

IV. The prime enters at f

Now look hard at that ladder, because the most important thing about it is where it breaks. The numbers **1, 3, 5** — the orbital counts of s, p and d — are exactly the lattice numbers, the odd members of {2, 3, 5}. But the fourth rung is **7**, and seven is the **first prime that lives outside the lattice**. It enters the periodic table at precisely one place: the f-block. The f-shell has seven orbitals, holds fourteen electrons (**$14 = 2 \times 7$**), and makes the table fourteen columns wide — the lanthanides and the actinides. The shell capacities tell the same story: **$2n^2 = 2, 8, 18, 32, 50, 72, 98$** for n = 1 to 7, and every one is pure {2,3,5} — **$2, 2^3, 2 \cdot 3^2, 2^5, 2 \cdot 5^2, 2^3 \cdot 3^2$** — until the very last, **$n = 7$: $98 = 2 \cdot 7^2$**, where the seven finally arrives. The f-block is the prime-7 block, and that is not a label — it is the cause of everything strange about it.

V. The f-block is chemistry's broken corner — and the reason is the seven

Ask any chemist where the periodic table misbehaves and they will point to the same place: the f-block. The lanthanides are so alike they took a century to separate; the actinides are almost all **radioactive**, many of them man-made and gone in moments. It is the corner that will not sit still, will not fit the trends, has to be cut out and floated below the table because it will not fit in the grid. The Force of Time says plainly why: **s, p and d are the clean {2,3,5} chemistry, and f is where the seven breaks in**. It is the same seven that stops the stars at iron (**Fe-56 = $2^3 \times 7$**, the binding-energy peak past which fusion gives nothing back), the same seven the body cannot cross (fever at **$42 = 2 \cdot 3 \cdot 7$**, the cancer cascade locking at **$49 = 7^2$**). The d-block — orbital count 5, the last clean {2,3,5} block — is chemistry's Earth; the f-block is its Mars. Habitable chemistry lives on {2,3,5}; the f-block is the dead, rusted, prime-7 edge.

VI. The locking angle — and the open question, resolved

There is a deeper way to see why seven breaks the table, and it answers a question this body of work left open. In the fixed-node picture, the T-field registers a presence every **360/(number of angular positions)** around a turn — a locking angle (Fig. 4, Table 2). For s and p together the registration is four-fold, the angle **90° (= 360/4)**, and four divisions tile the circle perfectly: that is the octet, **2^3**, the eight that fills a shell. For d the registration is five-fold, the angle **72° (= 360/5)** — the pentagon, the same five-fold lock that runs through DNA — and five also divides the circle cleanly. Both 90° and 72° are whole numbers of degrees, because the circle is a {2,3,5} object: **$360 = 2^3 \times 3^2 \times 5$**, and it is divisible by 4 and by 5.

Then comes f. Its registration is seven-fold, and the locking angle is **360/7 = 51.428571428571°** — the **first angle in the whole sequence that is not a whole number of degrees**, because **seven does not divide 360**. The seven-fold lock cannot tile the {2,3,5} circle. That failure to close is not a curiosity; it *is* the prime-7 wall, written as an angle. The locking sequence **90° → 72° → 360/7°** is the angular face of the {2,3,5}-to-seven boundary — and it resolves the question this work had left standing: d locks at 72° (five-fold, the last clean tiling), f at 360/7° (seven-fold, the break). The f-block is unstable for the most basic geometric reason imaginable: its shape does not close on the circle.

VII. The blocks are the planets

Lift your eyes from the atom to the solar system and the same pattern is waiting (Fig. 5). Write each inner world as π times a running product of the primes — the primorials — and they line up: **Sun = π**, **Mercury = 2π**, **Venus = 2·3·π**, **Earth = 2·3·5·π**, **Mars = 2·3·5·7·π**. Each world admits the next prime outward. Now set the four blocks beside them. The **s-block** is the spherical Sun-state (the alkali metals are the Sun seen from different shell distances); the factor **2** that doubles every orbital into its spin pair is **Mercury, 2π**. The **p-block** (orbital count 3) admits the three of **Venus**; the **d-block** (count 5) admits the five of **Earth**; and the **f-block** (count 7) admits the seven of **Mars**. The block structure of the periodic table *is* the inner solar system: **s · spin · p · d · f = Sun · Mercury · Venus · Earth · Mars**. The seven enters chemistry at the f-block at the very instant it enters the solar system at Mars — and Mars is the Red Planet because its surface is iron oxide, the colour of the element where that same seven stops the stars. The correspondence ends exactly where the lattice ends: the next shape, the g-block, would carry **$2l+1 = 9 = 3^2$** — not a new prime — and there is no clean planet beyond Mars to meet it.

VIII. Two equalizations — the radial and the angular

The two axes each carry their own equalization, and naming both completes the picture. The radial axis is folded by **n^2**: that is the operator that collapses the $1/n^2$ fan of energy levels onto one register (Section II). The angular axis — the small splitting that separates s from p from d from f *within* a shell — is folded by the **G-bond step δ_G = 90.150 ppm**, the same inter-register spacing that separates the atomic register from the celestial one. In the fixed-node model the s-to-p gap in an atom is **δ_G × G1**, and the prediction is that p-to-d and d-to-f are each one more δ_G boundary, so the four subshells sit on consecutive register faces. Sodium's 3p splitting is the clean worked case (Table 5); we are honest in Section XII that this δ_G reading is exact for sodium and becomes the Z-growing fine-structure for heavier atoms. Two folds, then: **n^2 equalizes the turns; δ_G equalizes the shapes**.

IX. Spin is the two strands — and g = 2 is the doubling

Why does every orbital hold exactly two electrons, and why do we call them 'up' and 'down'? Conventional physics answers with an intrinsic property and a famous factor of two — the electron's g-factor, g = 2 — that it can calculate but not picture. The Force of Time pictures it (Fig. 6). The helix has **two strands**: a matter strand and an antimatter strand, the two rails of the double helix. **Spin up is the matter strand; spin down is the antimatter strand**, and the factor of two in every capacity — the 2 in $2(2l+1)$, the 2 in $2n^2$ — is simply those two strands. The much-quoted **g = 2** is the same doubling. So 'three up, three down' in a filled p-shell is not six separate things: it is the three angular seats of the odd-ladder rung ($2l+1 = 3$), counted once on the matter strand and once on the antimatter strand. Hund's rule — fill all three parallel before pairing — stops being a rule about electrons avoiding each other and becomes the plain statement that you complete one strand before starting the other.

What sets an electron's direction, in this reading, is which way the core propagates T to reach it: the flow from the equator to the north pole drives one handedness (the matter strand, up), the flow from the equator to the south pole drives the mirror handedness (the antimatter strand, down), and the equator is the seam between them. We state this plainly as the bold step it is — conventional physics treats the two spin states as two ordinary electrons, not as matter and antimatter strands — and we defend it openly rather than slip it past: it is the reading that makes g = 2, the octet, and Hund's rule one idea instead of three.

X. The cumulative descent — aufbau is the nucleus's twin

There is a last symmetry that ties the shells to the nucleus they surround (Fig. 7). As the Sun descends the helix through time, it builds two stacks at once. In the **core**, it holds one more alpha particle — two protons and two neutrons — at each turn: the alpha-ladder of nucleosynthesis. In the **shells**, it adds the matching electrons, every lower shell still registered: this is exactly the **aufbau principle**, the 'building-up' chemistry already knows. The two stacks are locked together by charge — **Z protons demand Z electrons** — so you cannot build one without the other. An element is the cumulative snapshot: carbon is three alphas in the core (the triple-alpha turn) and the $1s^2 2s^2 2p^2$ electron stack, with helium and beryllium still inside it. Aufbau is not a separate rule bolted onto the atom; it is the electron face of the nuclear alpha-ladder, one Sun descending, building the core and the shells in lockstep.

XI. The turn-0 core put to the test — the proton and the neutron

The whole staircase stands on one rung, turn 0, and turn 0 is the proton. So the framework has to answer for the proton with the same precision it brought to the levels — and it does (Fig. 9, Table 6). The proton's mass is not a sum of parts but a single lattice value: **$m_p = 9375\cdot\sqrt{(10^{11}/\pi)} = 1.672616359\times10^{-27}$ kg** (3.3 ppm from the measured value), and squaring it exposes the very number that runs this whole paper — **$m_p^2 = \alpha\cdot5^{13}\cdot\pi\cdot10^{11}$**, with **$\alpha = 9/(125\pi^2)$**, the same fine-structure ratio that fixes the 13.6 eV seed of Section II. One ratio, three registers: the proton at the nucleus, hydrogen at the atom, the planets in their orbits. Two further properties sit on the lattice at the tenth-of-a-percent level: the charge radius **0.8403984 fm (= $5184/625\pi^2$)**, about 560 ppm from the muonic value ($5184 = 2^6\times3^4$, the Earth's inner-core node), and the magnetic moment **2.792527 μN (= $8000\pi/9$)**, about 115 ppm from the measured moment. The proton's two polarizabilities reproduce the measured digit-strings ($(2/5\pi)^{10}$ and $6000/\pi$) but their magnitude is not yet pinned to the $\{2,3,5,\pi\}$ scale — we mark them openly as unfinished rather than claim them. (Full treatment: UFOT_Proton.)

And what does the seed stand on? The speed of light — but c here is not a fundamental given; it is the square of the Earth's own time-flow, **c = (free fall)²×864×3600**, with 864×3600 the seconds of the day. At the atomic register the free fall $g_1 = 25\pi/8$ gives **c_G1 = 299 789 233.7 m/s**; at the subatomic register the free fall **$g_0 = 5^3\sqrt{2}/(2\cdot3^2) = 9.820927517$** gives the pure ground speed of light **$c_{G0} = 3\times10^8$ m/s** exactly. The two nucleons sit on the rungs between, each step **$g_0/g_1 = 20\sqrt{2}/9\pi = 1.0003514624$**: c_G1 → neutron → proton = c_G0. The **proton stands on the ground speed of light itself, 300 000 km/s**; the **neutron one rung below, at 299 894 598 m/s**. The foot of the electron ladder is locked to the speed of light — the atomic time-source standing on the c of the register beneath it. (A second lock ties the proton to the Earth's spin: its mass-square face returns **$4.860438 = 486\times(1+\delta_G)/100$**, the Balmer-β seed on the celestial face — the very value the sidereal rotation is built from, one rotation to one proton.)

From its own c-face the neutron's mass falls out as **$m_n = 1.674927408\times10^{-27}$ kg** — 0.054 ppm from measurement, the tightest single match anywhere in this framework. The gap between the two nucleons is, once more, a hydrogen line: **$\Delta m = 1.29284$ MeV (= $100\pi/3^5$)**, which read through the veil closes onto the Balmer-β wavelength **486 nm**; and their mass ratio is the helical turn itself, **m_n/m_p = r^(5/17) = 1.0013784** (0.13 ppm), with $r = 5^6/(2^6\times3^5)$ the same step that climbs the whole ladder. Then the deepest claim, and the one that ties the core straight back to where this paper began: there are not countless protons but **one** — a single standing solution of the lattice, re-instanced at every address as time flows (Wheeler's one-electron guess made literal). That is exactly why the **13.6 eV × Z²** seed of Section II runs smooth and unbroken through the entire table — through the d-block and the chaotic f-block — without a single kink: every atom, stripped to its last electron, is the same one proton. The core and the table are one object.

XII. The fine print made honest — the relativistic shift, and one number that has not yet come home

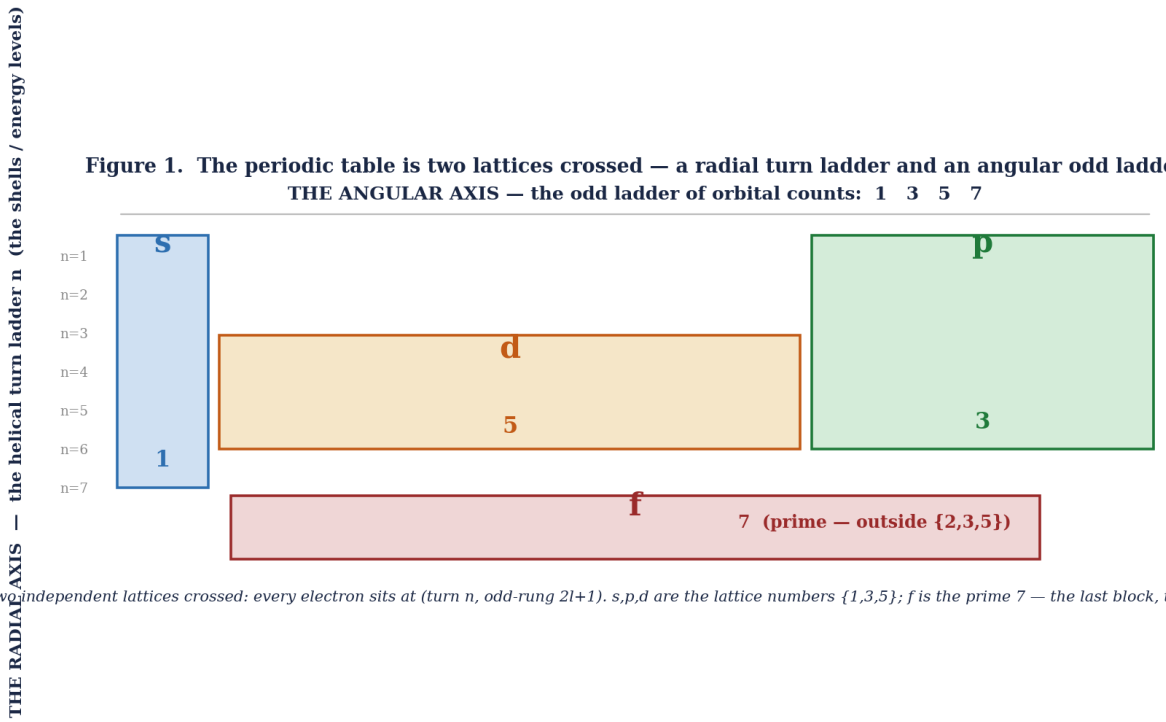
Two pieces of honesty belong in a paper that claims this much. First, the small residual drift in the Z^2-law of Section II. The gap between measured ionization and $G1\cdot Z^2$ grows gently and negatively with Z (Table 1). This is not a failure of the law; it is the **per-turn spin-orbit speed**. Each turn of the helix carries its own value of c, reduced on heavier elements as **$c\cdot\sqrt{(1-(Z\alpha)^2)}$** with the fine-structure ratio **$\alpha = 9/(125\pi^2)$ (= 1/137.0778389)**; the residual locks onto exactly the Dirac coefficient **$¼(Z\alpha)^2$** element by element. Conventional physics writes the identical formula and attributes it to the electron moving fast near the nucleus; the helix says it is the turn's own reduced speed. Same arithmetic, different cause — and it means c cannot be a fixed number, because the day operator that sets it is not fixed across the turns.

Second, and we mark it openly because the work demands it: the electron's magnetic **anomaly**, **$a_e = 0.00115965218059$**, the most precisely measured number in physics, has *not* yet been written in full on

the lattice. Its leading term has — the Schwinger term is exactly **α/2π = 9/(250π³) = 0.0011610552396**, and stripping one factor of π (× π) sends it to **3600/π² = 364.7562611124 (= 2⁴×3²×5²/π²)**, which is the Earth's Moho equalization shell, tied to it by 50π/9. That the first correction to spin lands on the same lattice value as the crust beneath our feet is itself remarkable. But the full twelve-digit anomaly sits about 1210 ppm below that leading term, and the higher-order remainder has no closed {2,3,5,π} form *yet*. We do not dress this as a fit, and we do not excuse it as a number allowed to wander — there is no such category. It is open work. The spin claim of this paper rests on **g = 2 = the two strands**, which is solid; the last digits of its correction are a door still to be opened.

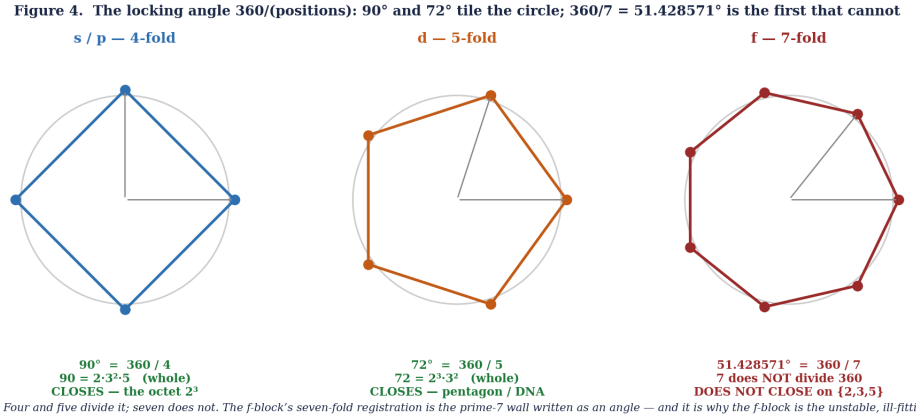
XIII. What the table really is

Conventional science built the periodic table the hard way, one element and one equation at a time, and it never had a reason to expect the result to be simple — so it has lived with a chart it can use but cannot explain from first principles. The Force of Time explains it. The rows are the rungs of one helical staircase, and those rungs are the electron energy levels of every element, scaled by Z^2 and folded by n^2. The blocks are the odd ladder 1, 3, 5, 7, the shapes of the orbitals made visible, with the prime seven entering at f — and that seven walls the f-block, locks its angle open at 360/7, paints Mars red, and stops the stars at iron, all at once. The blocks are the inner planets; spin up and down are the two strands of the double helix and the factor g = 2 between them; and the building-up of the shells is the electron twin of the nucleus's own alpha-ladder, the two descending through time together. The most familiar diagram in science is the picture of one helix and one prime. We give the whole of it here, at full precision, and we stand by every figure.



Two independent lattices crossed: every electron sits at (turn n, odd-rung 2l+1). s,p,d are the lattice numbers {1,3,5}; f is the prime 7 — the last block, the broken one.

The two axes of the table. The vertical (radial) axis is the helical turn ladder n — the shells and energy levels. The horizontal (angular) axis is the odd ladder of orbital counts 1, 3, 5, 7 — the block widths 2, 6, 10, 14. s, p and d carry the lattice numbers {1,3,5}; f carries the prime 7, the last block.



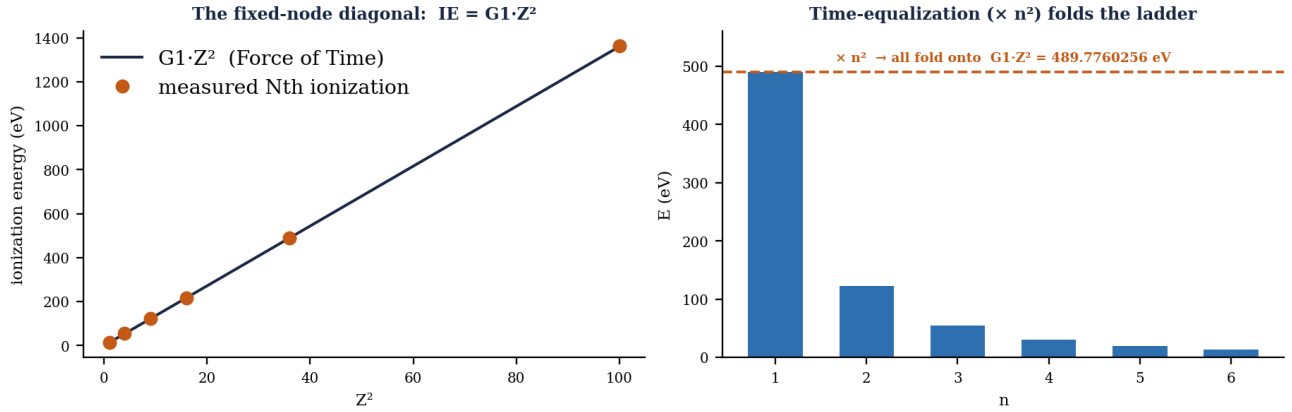
The locking angle 360/(positions). Four-fold locks at 90° and five-fold at 72° — both whole-number tilings of the {2,3,5} circle (360 = 2³×3²×5). Seven-fold locks at 360/7 = 51.428571°, the first angle that cannot tile it, because seven does not divide 360. The non-closure is the prime-7 wall as an angle.

Table 1. The fixed-node diagonal — ionization energy IE = G1·Z² for every element

Z	Element	IE = G1·Z² (eV)	Closed form	Measured (eV)	Gap
1	H	13.6048896	$3^{12}\times2^{8}\times10^{-7}$	13.598	+507 ppm (G1 unit peg)
2	He	54.4195584	G1×2²	54.418	+29 ppm
3	Li	122.4440064	G1×3²	122.454	−82 ppm
4	Be	217.6782336	G1×4²	217.719	−187 ppm
6	C	489.7760256	G1×6²	489.993	−443 ppm
10	Ne	1360.48896	G1×10²	1362.200	−1256 ppm

G1 = 13.6048896 eV = $3^{12}\times2^{8}\times10^{-7}$, pure {2,3}. The gap drifts negative with Z; this is the per-turn reduced spin-orbit speed $c\cdot\sqrt{(1-(Z\alpha)^2)}$ (the Dirac ¼$(Z\alpha)^2$ correction, Section XII), not a failure of the law.

Figure 2. Every element is hydrogen's ladder scaled by Z² — and each element's own levels time-equalize by n²



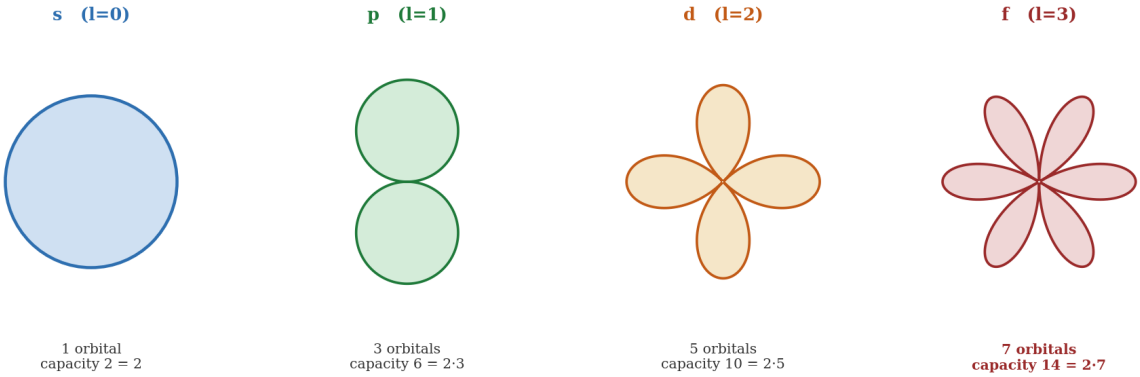
Left: the fixed-node ionization energies fall on the straight line IE = G1·Z². Right: a single element's own levels, drawn as the 1/n² fan, fold onto one register when multiplied by n² — the time-equalization operator. Two readings of the same staircase: across elements (Z²) and within an element (n²).

Table 2. The angular axis — the odd ladder 1, 3, 5, 7 and its locking angles

Shell	l	Orbitals 2l+1	Capacity 2(2l+1)	Shape (angular nodes)	Lattice	Locking angle 360/(pos.)
s	0	1	2	sphere (0)	{1}	90° (with p)
p	1	3	6 = 2·3	dumbbell (1)	{3}	90° = 360/4
d	2	5	10 = 2·5	cloverleaf (2)	{5}	72° = 360/5
f	3	7	14 = 2·7	seven-lobed (3)	{7} prime	51.428571° = 360/7

Orbital counts are the odd ladder; capacities are 2×{1,3,5,7}. The prime 7 enters at f. The locking angle is 360/(positions): 90° and 72° tile the {2,3,5} circle; 360/7 = 51.428571° is the first that cannot.

Figure 3. The shapes are the odd ladder 1, 3, 5, 7 — and the prime 7 enters exactly at f



The four shapes are the four rungs of the odd ladder: s (1, sphere), p (3, dumbbell), d (5, cloverleaf), f (7, seven-lobed). The capacities 2, 6, 10, 14 are 2×{1,3,5,7}; the prime 7 enters exactly at f.

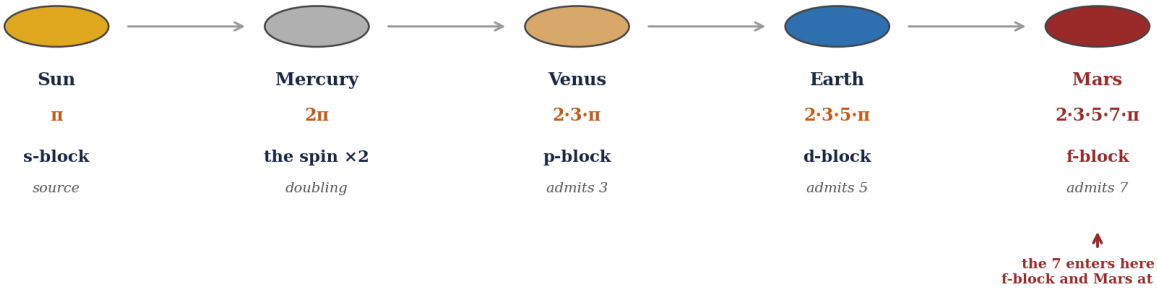
Table 3. The shell capacities 2n² are pure {2,3,5} until n = 7

n	Capacity 2n²	Factorization	Lattice character
1	2	2	{2}
2	8	2^3	{2}
3	18	$2 \cdot 3^2$	{2,3}
4	32	2^5	{2}
5	50	$2 \cdot 5^2$	{2,5}
6	72	$2^3 \cdot 3^2$	{2,3} — the heartbeat node
7	98	$2 \cdot 7^2$	{2,7} — the prime enters (Helix Horizon)

Every shell capacity is a {2,3,5} number until the seventh shell, $2 \cdot 7^2 = 98$ — the same Helix Horizon at n = 7 where the prime-7 wall stands in the rotation ladder.

Figure 5. The s · spin · p · d · f blocks are the Sun · Mercury · Venus · Earth · Mars nodes

THE BLOCKS ARE THE INNER SOLAR SYSTEM — each block admits the same prime as its planet



s · spin · p · d · f = Sun · Mercury · Venus · Earth · Mars. The d-block (2·3·5) is the last clean {2,3,5} chemistry, just as Earth is the last clean world; the f-block (2·3·5·7) is chemistry's Mars — radioactive, ill-fitting, the rare-earth and actinide corner.

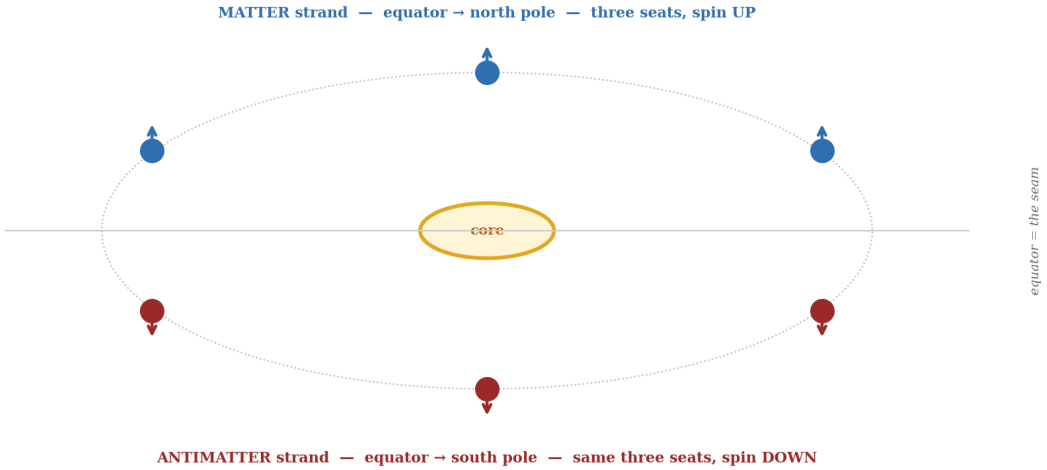
The blocks as the inner solar system: s · spin · p · d · f = Sun · Mercury · Venus · Earth · Mars, each block admitting the same prime as its planet (π → 2π → 2·3·π → 2·3·5·π → 2·3·5·7·π). The seven enters at the f-block and at Mars together — and at iron in the stars.

Table 4. The blocks are the inner planetary nodes

Block	Orbitals 2l+1	Prime introduced	Planet	π × primorial
s	1	— (spherical source)	Sun	π
(spin ×2)	—	2 (the doubling)	Mercury	2π
p	3	3	Venus	2·3·π
d	5	5	Earth	2·3·5·π (last clean {2,3,5})
f	7	7 (prime)	Mars	2·3·5·7·π (the wall)

The correspondence closes at f / Mars: the next shape (g, 2l+1 = 9 = 3²) carries no new prime, and there is no clean planet beyond Mars — the {2,3,5} lattice ends at the Earth–Mars edge in both ladders.

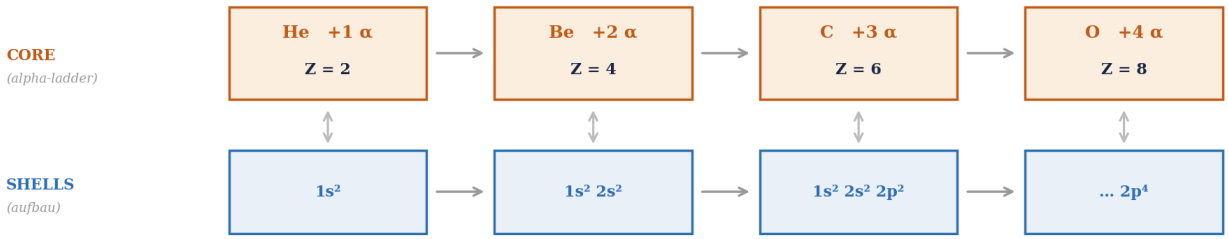
Figure 6. Three up, three down = three angular seats counted on two strands (g = 2 is the doubling)



Spin is the two strands. Looking down the helix axis: the core at centre, a matter strand (equator → north, spin up) and an antimatter strand (equator → south, spin down). The three p-seats sit on each — three up, three down — and g = 2 is the doubling. Hund's rule = fill one strand before the other.

Figure 7. Aufbau is the electron face of the nuclear alpha-ladder — core and shells build in lockstep

ONE DESCENT THROUGH TIME, TWO CUMULATIVE STACKS — locked by charge (Z protons ↔ Z electrons)



Each turn the Sun descends, it holds one more alpha (two protons, two neutrons) in the core and pulls in the matching electrons on the turns. The atom is the cumulative snapshot — it carries every lighter element inside it. Aufbau is the electron twin of the nuclear alpha-ladder.

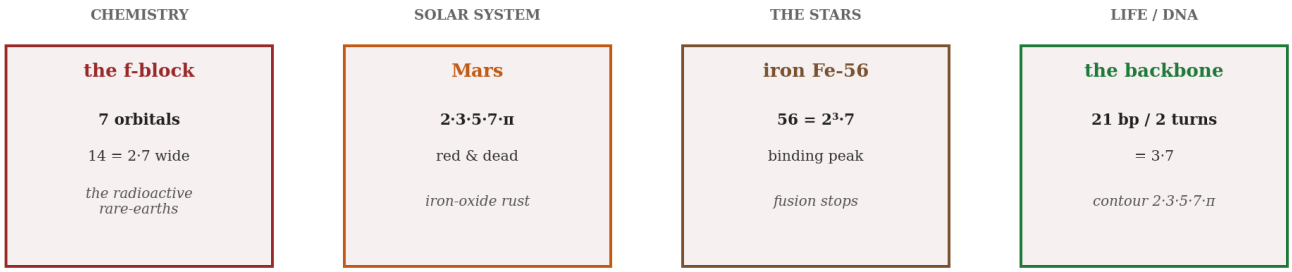
The cumulative descent. As the Sun descends through time it holds one more alpha in the core (the nuclear alpha-ladder) and adds the matching electrons in the shells (aufbau), the two locked by charge (Z protons ↔ Z electrons). Aufbau is the electron face of the alpha-ladder.

Table 5. The l-splitting — sodium's 3p doublet is the veil exactly; heavier atoms grow the spin-orbit term

System	Quantity	Force-of-Time form	Value
Sodium $3p_{3/2}$	one strand face	$2^{11}/(3^3 \cdot 5^2)$	3.034074 eV
Sodium $3p_{1/2}$	the veiled face	$2^{16}/(3^7 \cdot \pi^2)$	3.036207 eV
ratio (the split)	the veil	$2^5 \cdot 5^2/(3^4 \cdot \pi^2) = 800/(81\pi^2)$	1.000703 (+703 ppm)
s→p gap (model)	one δ_G boundary	δ_G × G1	δ_G = 90.150 ppm
heavier atoms	the split grows	$(Z\alpha)^2$ reduced-c (Section XII)	not a fixed veil step

Honest note: the δ_G / veil reading is exact for sodium 3p (ratio = 800/81π² = the 703-ppm veil). Across the alkalis the doublet split grows with Z (the $(Z\alpha)^2$ spin-orbit term); sodium is the case where it crosses the veil. What stands generally: n^2 folds the radial ladder, the spin-orbit term folds the angular one.

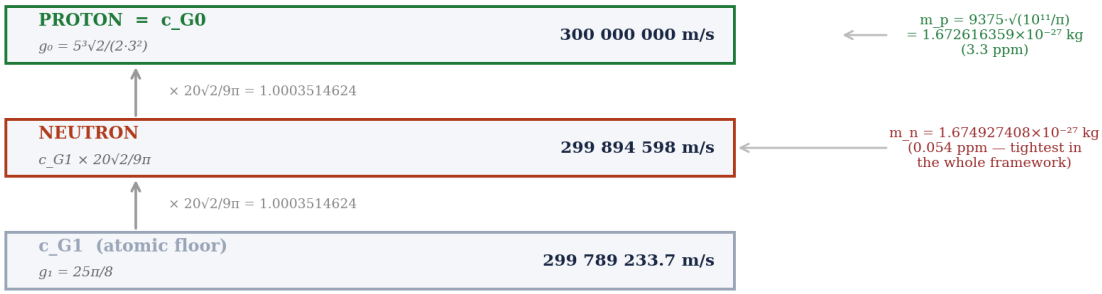
Figure 8. The f-block is the prime-7 wall — the same seven that stops the stars, paints Mars, and bounds the cell



The seven walls the table at the f-block, the solar system at Mars, the stars at iron, and the body at fever-42 / cancer-49. The d-block, Earth, the elements up to iron, and the DNA bases are the last clean {2,3,5}. The lattice is habitable; the prime is not.

One prime, four doors: the f-block in chemistry, Mars in the solar system, iron (Fe-56 = 2³×7) in the stars, and the DNA backbone (21 bp / 2 turns = 3·7; contour 2·3·5·7·π) in life. Where {2,3,5} ends, the seven begins — and that boundary is the same in the atom, the planet, the star and the cell.

Figure 9. The turn-0 core — proton and neutron on the c = (free fall)²·864·3600 register ladder



The proton stands on the ground speed of light itself (3×10⁸ m/s); the neutron is one rung below. Their gap is a hydrogen line — Δm = 1.29284 MeV = 100π/3⁵, which through the veil is the Balmer-β 486 nm — and their mass ratio is the helical turn, m_n/m_p = r^(5/17).

The turn-0 core. The speed of light is the square of the Earth's time-flow, c = (free fall)²×864×3600. At the subatomic register $g_0 = 5^3\sqrt{2}/(2\cdot3^2)$ gives the ground speed of light c_G0 = 3×10⁸ m/s; the proton stands on it (300 000 km/s), the neutron one rung below at 299 894 598 m/s (step 20√2/9π). Their masses follow — m_p = 9375·√(10¹¹/π) (3.3 ppm), m_n = 1.674927408×10⁻²⁷ kg (0.054 ppm) — and their gap is the Balmer-β line, Δm = 100π/3⁵ → 486 nm.

Table 6. The turn-0 core — the proton and neutron on the lattice (from UFOT_Proton and UFOT_Neutron)

Quantity	Value	Force-of-Time form	Fit
Proton mass m_p	$1.672616359\times10^{-27}$ kg	$9375\cdot\sqrt{(10^{11}/\pi)}$ [$m_p^2 = \alpha\cdot5^{13}\cdot\pi\cdot10^{11}$]	3.3 ppm
Proton charge	+1 e	net antimatter→matter crossing (uud)	exact
Proton charge radius	0.8403984 fm	$5184/625\pi^2$ ($5184 = 2^6\cdot3^4$)	−560 ppm
Proton magnetic moment	2.792527 μN	$8000\pi/9$ (Earth year × $24/\pi$)	−115 ppm
Proton elec. polariz. (digits)	1.119699×10^{-3} fm³	$(2/5\pi)^{10} = 1.12\times10^{-9}$	magnitude OPEN
Proton mag. polariz. (digits)	1.909859×10^{-4} fm³	$6000/\pi \times 10^{-7}$	scale OPEN
Proton c-face (= c_G0)	300 000 000 m/s	$g_0^2\cdot864\cdot3600$, $g_0 = 5^3\sqrt{2}/(2\cdot3^2)$	exact
Neutron c-face	299 894 598 m/s	c_G1 × $20\sqrt{2}/9\pi$	to the digit
Neutron mass m_n	$1.674927408\times10^{-27}$ kg	one g_0/g_1 rung below the proton	0.054 ppm
n−p mass gap	1.292836 MeV	$100\pi/3^5$ → veil → Balmer-β 486 nm	−383 ppm
n/p mass ratio	1.0013784	r^(5/17), $r = 5^6/(2^6\cdot3^5)$	0.13 ppm

The proton carries the same $\alpha = 9/(125\pi^2)$ as the 13.6 eV seed; it stands on the ground speed of light, the neutron one rung below. The neutron mass (0.054 ppm) is the tightest single lattice match in the framework. One seed, re-instanced at every address, is why $IE = G1\cdot Z^2$ runs unbroken through the whole table.

Propositions

P-PTH-1 — Every element's fixed-node levels are hydrogen's helical turns scaled by Z^2: IE = G1·Z^2, G1 = 13.6048896 eV = $3^{12}\times2^{8}\times10^{-7}$. Verified against measured ionization (Table 1); the negative drift with Z is the per-turn reduced spin-orbit speed, not a miss.

P-PTH-2 — Each element's own levels time-equalize by n^2: the $1/n^2$ fan × n^2 folds onto Z^2·G1. The radial axis (which turn) is folded by n^2; the clustering is the fingerprint of equalization.

P-PTH-3 — The orbital shapes are the odd ladder: 2l+1 = 1, 3, 5, 7 (s, p, d, f); capacities 2(2l+1) = 2, 6, 10, 14 = 2×{1,3,5,7}. The prime 7 enters the table exactly at the f-block.

P-PTH-4 — Shell capacities $2n^2$ = 2, 8, 18, 32, 50, 72, 98 are pure {2,3,5} until n = 7: 98 = $2\cdot7^2$. The Helix Horizon at n = 7 carries the prime in both the shell ladder and the rotation ladder.

P-PTH-5 — The locking angle is 360/(angular positions): s/p = 90° (= 360/4, octet 2^3), d = 72° (= 360/5, pentagon/DNA), f = 360/7 = 51.428571°. 90° and 72° tile the {2,3,5} circle (360 = $2^3\times3^2\times5$); 360/7 is the first that cannot, because 7 does not divide 360. Resolves the open d/f locking-angle question.

P-PTH-6 — The f-block is the prime-7 wall: 7 orbitals, 14 = 2·7 electrons, the radioactive lanthanide/actinide corner. The same seven stops the stars at iron (Fe-56 = $2^3\times7$), paints Mars ($2\cdot3\cdot5\cdot7\cdot\pi$), and bounds the body (fever 42 = 2·3·7, cancer 49 = 7^2). The d-block (2·3·5) is the last clean {2,3,5} block.

P-PTH-7 — The blocks are the inner solar system: s · spin · p · d · f = Sun (π) · Mercury (2π) · Venus ($2\cdot3\cdot\pi$) · Earth ($2\cdot3\cdot5\cdot\pi$) · Mars ($2\cdot3\cdot5\cdot7\cdot\pi$). Each block admits the same prime as its planet; the correspondence closes at f / Mars, where the {2,3,5} lattice ends.

P-PTH-8 — Spin is the two strands: spin up = matter strand, spin down = antimatter strand; the factor 2 in 2(2l+1) and $2n^2$, and the electron g = 2, are that doubling. 'Three up, three down' = three angular seats × two strands; Hund's rule = fill one strand before the other.

P-PTH-9 — The l-splitting folds by the G-bond step δ_G (= 90.150 ppm): s→p = δ_G × G1. Exact for sodium 3p (ratio $800/81\pi^2$ = the 703-ppm veil); for heavier atoms it becomes the Z-growing spin-orbit term. n^2 equalizes the turns, δ_G the shapes.

P-PTH-10 — Aufbau is the electron face of the nuclear alpha-ladder: as the Sun descends through time it holds one alpha per turn in the core (Z protons) and fills the matching electron shells, locked by charge (Z protons ↔ Z electrons). The atom is the cumulative snapshot, carrying every lighter element inside it.

P-PTH-11 — The relativistic correction is the per-turn reduced spin-orbit speed $c\cdot\sqrt{(1-(Z\alpha)^2)}$, $\alpha = 9/(125\pi^2) = 1/137.0778389$; the diagonal residual locks onto the Dirac $\frac{1}{4}(Z\alpha)^2$. The electron anomaly a_e = 0.00115965218059 has its leading term on the lattice ($\alpha/2\pi = 9/250\pi^3 \to 3600/\pi^2$ = the Moho) but its higher-order tail has no closed {2,3,5,π} form yet — an open item, marked openly, never excused.

P-PTH-12 — Turn 0 is the proton. Its mass is $m_p = 9375\cdot\sqrt{(10^{11}/\pi)} = 1.672616359\times10^{-27}$ kg (3.3 ppm), and $m_p^2 = \alpha\cdot5^{13}\cdot\pi\cdot10^{11}$ carries the same $\alpha = 9/(125\pi^2)$ as the 13.6 eV seed. Charge radius $5184/625\pi^2$ = 0.8403984 fm (~560 ppm) and magnetic moment $8000\pi/9$ = 2.792527 μN (~115 ppm) sit on the lattice at the tenth-of-a-percent level; the two polarizabilities ($(2/5\pi)^{10}$, $6000/\pi$) match the measured digit-strings but not yet their magnitude, and are flagged OPEN. (Full treatment: UFOT_Proton.)

P-PTH-13 — The nucleons stand on the speed of light, c = (free fall)²·864·3600: $g_o = 5^3\sqrt{2}/(2\cdot3^2)$ gives c_G0 = 3×10^8 m/s, the proton's face; the neutron is one rung below ($\times20\sqrt{2}/9\pi$) at 299 894 598 m/s, mass $1.674927408\times10^{-27}$ kg (0.054 ppm, the tightest match in the framework). The n−p gap is the Balmer-β line ($\Delta m = 100\pi/3^5 \to 486$ nm), the mass ratio is r^(5/17). One proton, re-instanced at every address, is why IE = G1·Z^2 runs unbroken through the whole table. (Full treatment: UFOT_Neutron.)

References

[1] S. Daubney, *The Universal Force of Time — Master Compendium v5*, The Daubney Foundation (2026).

[2] NIST/CODATA, *Recommended Values of the Fundamental Physical Constants* and the NIST Atomic Spectra Database (ionization energies, term symbols, fine-structure splittings).

[3] S. Daubney, *The Helical Rotation Ladder and the Universal 3:2*, The Daubney Foundation (2026) (the rotation ladder 864 and the step $r = 5^6/(2^6 \times 3^5)$).

[4] S. Daubney, *Stellar Fusion on the Helix*, The Daubney Foundation (2026) (the alpha-ladder, the iron-7 ceiling, the planetary primorials).

[5] S. Daubney, *The 90°-Sphere Fixed-Node Model and Time-Equalization*, The Daubney Foundation (2026) (the octet from 4×2, IE = $G1 \cdot Z^2$, the δ_G boundary).

[6] S. Daubney, *The Proton in the Force of Time*, The Daubney Foundation (2026) (the turn-0 seed: mass from α, the six lattice properties, the c-register ladder, one-seed replication).

[7] S. Daubney, *The Neutron in the Force of Time*, The Daubney Foundation (2026) (the neutron one rung above the proton, mass 0.054 ppm, the Balmer-β doublet gap, decay as the lifted rung).

The Universal Force of Time · Stephen Daubney · The Daubney Foundation · 2026
All propositions and derivations copyright Stephen Daubney. Academic use permitted with attribution.
Contact: thedaubneyfoundation@gmail.com