The Colour of Time

The Seven Colour Boundaries of the Visible Spectrum — the complete master derivation. The seven boundaries, the radian key, the π-class staircase, the helix ladder and the speed cascade beneath them. Full precision; nothing omitted.

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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 dΣT=0 governs all change: T is never created or destroyed, only redistributed.

Abstract

The visible spectrum is not a continuous wash of light — it is a precisely encoded map of the Earth-register values of nature. This paper sets out the complete case, with every chain worked in full and every number at full precision. The seven boundaries between the colour regions are exact {2,3,5,π} lattice nodes, and each encodes a property of our world: the solar day, the DNA helical turn, body temperature, the Moho sphere, the orbital year, the speed of light. A wavelength in nanometres is, in UFOT, a degree angle directly — read each boundary in radians (×π/180) and the value falls out. Beneath the boundaries runs a **helix ladder** anchored on the 864 nm carrier, itself a two-faced ground (white 864/864 = 1; cyan through the veil → 8.64, and cyan ÷ 864 × 100 = 180/π). The two DNA boundaries mark one helix turn each — red at $750000/864^2 = 5^6/(2^6\times3^5)$ = r = 1.004693930041, green/yellow at 10/r = 9.953280000000000. The sodium D line at 589 is the dominant line itself, c_G1 = 299,789,233.683089 m/s, and the speed of light is a four-rung cascade c_NaD · c_G1 · c_dual · c_G2 stepped by the G-bond δ_G = 90.1506 ppm, a √-map whose fixed point is c_G2. Green/yellow's helix term — the radius 0.6396080210418892 — reverts on one road to the Earth's sidereal rotation (23564.069025472618 s) and on another to that same c_G2, welding the colour ladder to the speed cascade at both ends. The band has a plain architecture: crossing the veil raises the π-class of every boundary by exactly one (the π-class staircase), and the whole visible band — from the violet gateway to the red ceiling — spans exactly $\pi^2/5$ = 1.973920880217872. Read at full scale, the bare radian lands on the world itself: Blue/Cyan × 10^4 = 86,400, the solar day; Green/Yellow × 10^5 = 995,328, the DNA helix turn (= 11.52 days of turning); UV/Violet is the Planck quantity of action. Each boundary, moreover, carries three register faces one δ_G apart — g_1, g_2 and lattice — the same structure the speed of light wears: the yellow/orange g_1 face collapses to a pure power of three, $3^{10}/100$, and the orange/red value returns the surface free fall 25π/8 exactly. The prism, the rainbow, the band speeds, the entry angle and the media indices are all derived. Colour, free fall, the day, the DNA helix and the speed of light are one lattice, read in light. Every figure quoted can be reproduced on a calculator; we stand by the figures.

1. The prism and the question

Hold a glass prism to the light. A white beam enters one face and a fan of colour spills from the other — violet at one edge, red at the other, the same sequence in every prism, on every day. Newton saw this in 1666 and concluded that white light was a mixture the prism merely sorted out. The Universal Force of Time says something different, and this paper is the full demonstration of it. White light is not a mixture: it is the T-field carrier, a single frequency at 864 nm, above the visible red edge, from which the entire spectrum is unfolded when the carrier meets a T-dense medium. The seven boundaries between the colour regions are not perceptual conventions agreed by committee. Each is an exact node of the {2,3,5,π} lattice — the numbers expressible as products of powers of 2, 3 and 5, scaled by powers of π — and each encodes a physical property of our world that has, on the surface, nothing to do with light. We give every boundary, every chain that produces it, and every property it carries, at full precision, so that the case rests on the figures and not on persuasion.

2. The Degree Principle and the veil

One idea unlocks the rest. A wavelength in nanometres is, in UFOT, a degree angle directly — the Degree Principle. 495 nm is 495 degrees. Conventional physics writes its angles in radians, and the conversion between the two domains is the ratio $180/\pi$ = 57.29577951308232, which we call the **veil**. It is not a metaphor and not a coincidence: it is the single factor that has hidden the lattice from three centuries of measurement, because every instrument calibrated in SI units carries the radian, and the lattice is written in degrees. Read a boundary wavelength as degrees and multiply by π/180, and you cross the veil from the spectrum into the bare value of nature it carries. This one operation — the radian key — runs through the whole paper.

3. White light is not a mixture — the 864 carrier

The number 864 runs through UFOT as the universal T-pivot. The solar day is 86,400 s = 864 × 100. In lattice form $864 = 2^5 \times 3^3$. White light sits at 864 nm, one node above the visible red boundary at 750 nm; the prism does not reveal a pre-existing mixture, it unfolds the T-lattice from this carrier into its constituent nodes, exactly as a radio receiver unfolds a programme from a single carrier wave.

The chlorophyll octave.

Chlorophyll absorbs primarily at 432 nm = $2^4 \times 3^3$, and 864 = 2 × 432. Plant life receives the carrier at its sub-harmonic, one octave down — the precise relationship a receiver holds to its carrier. Life is tuned to the 864 pivot.

The orbital-year centre.

Run the Earth's orbital year through the carrier and the veil and it returns the centre of the visible band: T_year(G1) × 864 / veil × 10 = $9\pi^5/50 \times 10$ = 550.835 nm, against the arithmetic mean of the seven boundaries, 550.598 nm. The planet's period and the centre of its own visible spectrum are the same T-structure read through white light.

4. The seven boundaries — each one derived

Here are the seven boundaries, each with its lattice form and the property it encodes. None is an approximate match to a measured colour edge; each is an exact node, given to full precision. The map is Figure 1; the per-boundary derivations follow.

UV/Violet — 379.9544386587667 nm = 3750/π². The numerator $3750 = 2 \times 3 \times 5^4$ is pure {2,3,5}. This is the gateway where the T-field hands the spectrum to the quantum register; the π^2 denominator is the signature of a register crossing. Read in radians it is the Planck quantity, 6.631455962162306 (= 125/6π) — the violet edge of vision is the seam where light passes into the quantum register, written as a clean {2,3,5}/π node.

Violet/Blue — 450.0000000000000 nm = 45° = π/4 rad. 450 ÷ 10 = 45°, the bisector of the right angle; in radians 7.853981633974483 = 5π/2. Anchored to pure geometry and register-invariant, because π/4 is.

Blue/Cyan — 495.0355349930313 nm = 7776/(5π). $7776 = 2^5 \times 3^5$. The chain is the solar day: 86,400 × veil ÷ 10^6 ÷ 5. In radians it is exactly 8.640000000000000 = 864/100 — the carrier itself. The blue–cyan boundary is the terrestrial day written into light.

Green/Yellow — 570.2809363119720 nm = $2^9 \times 3^7/(5^4\pi)$. The chain runs from T_rad = 995,328 = $2^{12} \times 3^5$ — the B-DNA helical-turn number — through the veil. In radians it is 9.953280000000000 = 995,328/10^5. The green–yellow boundary is the DNA molecule, in the heart of visible light.

Yellow/Orange — 590.9051430021140 nm = $18^3/\pi^2$. $5832 = 18^3 = 2^3 \times 3^6$. The chain encodes 36,864 = $2^{12} \times 3^2$ = human body temperature × 1000 (36.864 °C). In radians, 10.313240312354818 = 32.4/π. Life's temperature is written into the warm edge of visible light. This boundary also carries the speed of light: this $18^3/\pi^2$ value is its **lattice face** (Section 5).

Orange/Red — 619.2294611174302 nm = $19200/\pi^3$. $19200 = 2^8 \times 3 \times 5^2$. The chain runs through the oceanic Moho radius r_Moho = 20000/π km, whose sphere volume scaled by the veil gives this wavelength. In radians, 10.807592921849363 = $320/3\pi^2$. This value is the boundary's **g_1 face** — it returns the surface free fall exactly (Section 5).

Red upper — 750.0000000000000 nm = 2×3×5³. The chain: c_G1 × π²/8,100,000 = 15π⁴/4 = 365.284091 days (the G1 orbital year); and the lattice speed of light is 750 × 10^6 m/s. In radians, 13.089969389957473 = 25π/6. The red boundary is the speed of light in lattice units and carries the orbital year — and, as Section 7 shows, it lands on one helix turn above the carrier.

5. Each boundary has three register faces — g_1, g_2, lattice

A boundary value is not a single number but one of three **register faces**, one G-bond step δ_G = 90.1506 ppm apart — exactly the structure the speed of light carries as c_NaD · c_G1 · c_dual · c_G2. The operation that reveals them is a single chain: a wavelength divided by the cyan carrier is a free fall, times 2π a frequency, times 4 (×10^7) a speed — so **c = λ × 8π×10^7 / cyan**, with cyan = 7776/(5π). Two boundaries demonstrate the structure exactly, and resolve what were the last two open boundaries.

Yellow/Orange has three speed faces. Its g_1 face is the cleanest value in the band: c_G1 × cyan / (8π×10^7) collapses — the π² cancels, 7776 = 2^5×3^5 — to **3^{10}/100 = 590.4900000000 nm**, a pure power of three, which returns c_G1 = 299,789,233.683089 m/s. One G-bond step up is the g_2 face, **590.5432330298 nm** = 3^{10}/100 × (1+δ_G), returning c_G2 = 299,816,259.863386. And the value the band wears in Section 4, **18^3/π² = 590.9051430021140 nm**, is its **lattice face** — it returns the pure lattice speed c = 3.000000000×10^8 m/s exactly, with frequency 7.500000000. Three faces, three speeds of light, one colour boundary.

Orange/Red is already on its g_1 face. Read its radian value 320/3π², invert it, and run the free-fall chain: (3π²/320) × 16000 / 2π / 24 = 150π² / 2π / 24 = 75π/24 = **25π/8 = 9.817477042468 m/s²** — the surface free fall g_1, exactly, the π² again cancelling. So 19200/π³ is the g_1 (dominant, free-fall) face of orange/red; its g_2 face sits one step below at 619.1736422400 nm. The two boundaries are caught on different faces — yellow/orange on its lattice face, orange/red on its g_1 face — but both wear the same three-rung δ_G structure the speed of light wears. The full mapping of all seven boundaries onto their g_1/g_2/lattice faces is the next stage of this work.

6. The radian key — each boundary is a value of our world

Section 4 named the property each boundary encodes; the radian key shows it in one operation, the cross of the veil. Multiply a boundary wavelength (a degree angle) by π/180 and the bare value appears. Three land on famous numbers outright: UV/Violet on the Planck quantity 6.631455962162306, Blue/Cyan on the solar day 8.64, Green/Yellow on the DNA helical turn 9.95328 → 995,328 = 2^{12}×3^5. The full radian ladder is Figure 2 and the Appendix table. None of these is a universal constant: each is the value its lattice element takes at Earth's register, and a different register would read a different value of the same element and be equally correct. The veil 180/π is the bridge that has hidden the lattice; the radian key lifts it.

7. The helix ladder — the structure beneath the boundaries

The boundaries are not a flat list; they sit on a ladder whose rungs are helix turns, anchored on the 864 carrier. The carrier has **two faces**. Directly, white light is the ground state: 864/864 = 1. Through the veil, cyan is the same ground. Read cyan as degrees and convert to radians: cyan × π/180 = 7776/(5π) × π/180 = 7776/900 = **8.640000000000000** exactly — the carrier itself, in radians (= 864/100). And run cyan through the carrier: cyan ÷ 864 × 100 = (7776/(5π))/864 × 100 = 9/(5π) × 100 = **57.2957795131 = 180/π**, the veil exactly. Cyan is the carrier seen through the degree–radian arc — the ground state wearing its second face, exactly as the speed of light wears its sodium and dual faces (Section 8).

Red — one helix turn out.

Take the red boundary 750, divide by the carrier 864, and again by 864 with the ×1000 scale: 750 ÷ 864 × 1000 ÷ 864 = 750000 / 864². Now 864² = 746496 = 2^{10}×3^6, and 746496 / 15552 = 48 exactly (15552 = 2^6×3^5), so 750000 / 746496 = 15625 / 15552 = 5^6/(2^6×3^5) = **r = 1.004693930041** — the universal UFOT helix ratio, the same r that corrects the double-slit fringe spacing, sets Mercury's precession step and builds the G-bond shell tower. Equivalently, 750 ÷ 864 × 1000 = 868.0555555555556 = 5^6/18 = 864 × r: the red boundary lands exactly **one helix turn above the 864 ground**.

Green/Yellow — one helix turn the other way.

The green/yellow boundary is the inverse turn. 1/r = 15552/15625 = 0.995328 exactly, so 10/r = 9.953280000000000 — and that is precisely the radian value of green/yellow (570.2809363119720 × π/180 = 9.95328). Multiply back by the veil: 9.95328 × 57.2957795131 = 570.2809363119720 nm. So green/yellow sits at **−one helix turn (10/r)**. Fittingly,

the two boundaries that carry the DNA helix — green/yellow and red — are the two helix-turn rungs; the others sit on the lattice but are not turns.

Read the whole band in radians and the ladder is plain (Fig. 2): UV/Violet 6.631455962162306 (Planck, = 125/6π), Violet/Blue 7.853981633974483 (5π/2), Blue/Cyan 8.640000000000000 (the ground's arc face), Green/Yellow 9.953280000000000 (= 10/r, −1 turn), Yellow/Orange 10.313240312354818 (= 32.4/π), Orange/Red 10.807592921849363 (= 320/3π²), Red 13.089969389957473 (= 25π/6, and r by the carrier route). The radian value climbs monotonically; the DNA boundaries are the turning posts.

8. The anchor — sodium is the dominant line, and the speed of light is a cascade

The ladder is pinned to the speed-of-light cascade at both ends. At the **anchor** stands sodium. The sodium D line is the dominant line c_G1 expressed as a colour wavelength, with the very two faces the speed ladder wears, one G-bond step apart. Its clean face is 589.0486225481 nm = g_1 × 60 = 375π/2. Divide by 60 and you recover the surface free fall, g_1 = **9.817477042468** m/s² (= 25π/8). Square it and carry it up: g_1^2 × 864 × 3600 = **299,789,233.683089 m/s = c_G1**, the dominant line, also = $2^3 \times 3^5 \times 5^6 \times \pi^2$. Its measured face is 588.9955242 nm = 589.0486225481 / (1+δ_G) — the c_NaD face one step below, exactly as c_NaD = c_G1/(1+δ_G) = 299,762,209.939000.

The four-rung speed cascade.

The speed of light is not a single number but a four-rung ladder, each rung one G-bond step δ_G = 90.1506 ppm from the next (Fig. 3): c_NaD = 299,762,209.939000 (sodium, the anchor) · c_G1 = 299,789,233.683089 (the dominant line, where Hβ 486 sits) · c_dual = 299,802,746.773237 (the midpoint — the value an instrument measures) · c_G2 = 299,816,259.863386 (the ceiling). The climb from c_G1 to c_G2 is a square-root map of slope exactly one-half, so each step halves the remaining gap (δ_G/2 + δ_G/4 + δ_G/8 + … = δ_G); c_G2 is the attracting fixed point the cascade spirals into but reaches only in the limit. The single number usually quoted for the speed of light is the measured midpoint c_dual — one register-blind reading of a four-rung ladder, which is why it never lands cleanly on the lattice: it is an average of rungs, not a rung.

9. The ceiling — the hub radius welds colour to the speed cascade

At the **ceiling** stands green/yellow. Take its helix term to the radius radius = r × 4 / 2π = **0.6396080210418892**, and two exact roads open (Fig. 4). On the first, square it and × 24: 0.6396080210418892^2 × 24 = **9.818362093946924** m/s² — the g_2 free fall, the g_1-face — and × 2400 = **23564.069025472618 s**, the Earth's sidereal rotation. On the second, × 9375 (= 3×5^5, the space-time-dimensional mass roll-factor) = 5996.325197, ÷ 2 and × 10^5 = **299,816,259.863386 m/s = c_G2**. And that c_G2 is the same ceiling that caps the speed cascade of Section 8. So the colour ladder and the speed cascade are one structure: sodium holds the anchor at c_G1, green/yellow reaches the ceiling at c_G2, and the carrier 864 is the ground beneath both. One green/yellow boundary reaches both the Earth's own rotation and the ceiling of the speed of light.

10. Why the prism separates — each band its own speed of light

Standard optics says the prism spreads white light because the refractive index of glass depends on wavelength. True — but UFOT supplies the reason underneath: each band travels at its own dimensional speed of light, and the index gradient of the glass is the physical implementation of that sorting. A band's speed reads two ways. The linear (radial) law is $\text{speed}_1 = \lambda \times M/2$, with $M = 2^3 \times 5^6 \pi^2$ = 1,233,700.550 = c_G1/3^5. The free-fall (orbital) law is $\text{speed}_2 = (\lambda/K)^2 \times 864 \times 3600$, with K = 3888/(25π) = 49.5035534993. Speed_1 grows as λ, speed_2 as λ^2 — two different curves, equal at exactly one wavelength.

They cross at Hβ = 486 nm (= 2×3^5), where both give c_G1 = 299,789,233.683089 m/s (Fig. 5): speed_1 = 486 × M/2 = 243 × 1,233,700.550 = c_G1, and $\text{speed}_2 = g_1^2 \times 864 \times 3600$ = c_G1, exact on both. 486 is the light-equalisation point — the optical twin of the Moho shell, where the Earth's radial and orbital T-waves equalise — which is why Hβ is not a boundary but the generating fixed point of the whole spectrum: the one place where the two ways of being light agree. The carrier sits a clean {2,3} interval above it — 864 ÷ 486 = 16/9 = $2^4/3^2$ — so the generating line and the white carrier are two rungs of the same ladder. Everywhere else the two speeds differ, and that difference — a band carrying two distinct T-speeds at once — is what the prism reads out as separation. White light at 864 nm carries the widest gap; Hβ carries none. The prism sorts light by how far each band sits from its own equalisation.

11. The prism as a T-lattice decoder — the entry angle is a hydrogen line

The prism's own geometry confirms the reading at every stage. In the minimum-deviation configuration of a 60° equilateral prism, every colour crosses the prism at the same internal angle of exactly 30° = 2×3×5, a pure {2,3,5} node, regardless of the glass; the dispersion that separates the colours comes from how each band's index meets that fixed node. White light enters a BK7 prism at minimum deviation through an angle of exactly 48.99688950°, whose cosine is cos(48.99688950°) = **0.6561000000 = $3^8/10^4$** — the Balmer Hα line, 656.1 nm = $3^8/10$, to the digit. Hα is the entry gate of the dominant line, locked to Hβ by Hα/Hβ = 27/20 = $3^3/(2^2\times5)$. So the entry angle alone pins the speed of white light to the dominant line c_G1 = 299,789,233.683089 m/s — a single angle measured on a glass prism, reading off as a hydrogen line, stating that the true speed of white light is the lattice value. The carrier then fans into its {2,3,5,π} boundaries across 2^6 = 64 arcminutes; the red boundary deviates at 38.211332°, close to 120/π = 38.197186° (120 = $2^3\times3\times5$).

12. The rainbow — where the {2,3} dual makes its own 7

A rainbow forms when sunlight enters a spherical droplet, reflects once inside, and exits — the geometry Descartes worked out in 1637. For water, whose ideal index is the {2,3}-dual n = 4/3 = $2^2/3$, the rainbow geometry gives $\cos^2(i)$ = 7/27 and $\sin^2(r)$ = 5/12, and a primary bow at θ = 4r − 2i = 42.03°. The 7 in $\cos^2(i)$ = 7/27 looks at first like a stranger to the lattice — but it is not a new number. The rainbow condition is $\cos^2(i) = (n^2 - 1)/3$; with n = 4/3 that is $(2^4/3^2 - 1)/3 = (2^4 - 3^2)/(3^2\cdot3)$ = 7/27. The 7 is **$2^4 - 3^2$** = 16 − 9 — the difference between two adjacent powers in the {2,3} ladder, not a prime factor in its own right. The lattice is {2,3,5,π}; the rainbow's apparent seven is simply what that lattice makes when you subtract one of its rungs from another, exactly as water's index 4/3 is itself the {2,3} dual of glass's 3/2. Far from breaking the lattice, the rainbow shows it generating a new integer from inside its own grammar. This same arithmetic sets the Descartes limit beyond which no primary bow can form. It is also why the colours run the opposite way to a prism — red on the outer arc near 42.4°, violet on the inner near 40.5°: the single internal reflection turns the droplet into a mirror as well as a lens, and a mirror reverses the order the refraction laid down. Glass (n = 3/2) and water (n = 4/3) are {2,3}-dual — their product is exactly 2, the same two numbers swapped between numerator and denominator — which is why their spectra are colour-mirrors of one another.

13. The hidden values — λ ÷ 864

Divide any boundary by the carrier 864 and the {2,3} carrier structure is removed, exposing the value beneath. Blue/Cyan ÷ 864 = 9/(5π) = the veil/100 exactly — the carrier, the solar-day boundary and the degree/radian arc are one algebraic object seen three ways. Red ÷ 864 = $5^3/(2^4\times3^2)$ = 0.8680555556, the DNA helical-turn cosine — and, carried one step further as in Section 7, $750000/864^2$ = r, the helix turn itself. UV/Violet ÷ 864 × 200 = $5^6/(18\pi^2)$ = Mercury's orbital period, 87.952 days. The carrier is the comb through which the whole spectrum is read, and λ ÷ 864 is the operation that lays the helix bare.

14. The media home nodes and birefringence

Each transparent medium has a characteristic refractive index, and in UFOT those indices are clean {2,3,5} ratios: n = 4/3 (water), n = 3/2 (glass), n = 5/3 (calcite, ordinary ray). Each is a {2,3,5} node and each reaches its ideal value at a specific colour boundary — its T-home node. Water (4/3) locks at Yellow/Orange, the body-temperature boundary — the medium of the living body keyed to the wavelength of life's own temperature. Calcite's ordinary ray (5/3) locks at Blue/Cyan, the solar-day node. Glass (3/2) is the {2,3}-dual of water, the two of them mirror media. Quartz, the silicon bridge element, locks nowhere — a bridge cannot be register-locked or it would not bridge. (Diamond's very high index sits above this {2,3,5} family; its exact lattice form is still under investigation and is not asserted here.) Calcite is the one common material that shows two complete spectra from a single beam — the double image of Iceland Spar — because its c-axis has 3-fold ({3}) symmetry and light couples to it differently by polarisation, producing two simultaneous T-channels whose two indices sum to π ($n_o + n_e = \pi$). Through Iceland Spar you see the two T-channels of a {3}-axis material at once.

15. The architecture of the band — the π-class staircase and the π²/5 span

Step back from the individual boundaries and a clean architecture appears. The radian key of Section 6 is a single operation — multiply by π/180 — and π/180 raises the power of π in a value by exactly one while the 180 = $2^2 \times 3^2 \times 5$ changes nothing on the {2,3,5} side. So crossing the veil moves every boundary up exactly one rung of what we call its **π-class**: the count of how many powers of π the value carries (Fig. 6). UV/Violet $3750/\pi^2$ (π-class −2) becomes $125/6\pi$ (−1); Orange/Red $19200/\pi^3$ (−3) becomes $320/3\pi^2$ (−2); Blue/Cyan $7776/(5\pi)$ (−1) becomes the pure 8.64 (0); Violet/Blue 450 (0) becomes $5\pi/2$ (+1); Red $2 \times 3 \times 5^3$ (0) becomes $25\pi/6$ (+1). Every one of the seven obeys the same law — π-class(radian) = π-class(nm) + 1 — without exception. The veil is not a fudge factor; it is a single, uniform step on a staircase, and the spectrum is the set of stairs.

The whole band spans exactly π²/5.

There is one more number hiding in plain sight. Divide the red ceiling by the violet gateway: 750 ÷ $(3750/\pi^2)$ = $750\pi^2/3750$ = **$\pi^2/5$ = 1.973920880217872**, exact to the last digit (0.0 ppm). The entire visible band — from the seam where light enters the quantum register to the seam where it leaves for the infrared — is one clean {2,3,5,π} ratio, $\pi^2/5$, just short of a factor of two. Vision does not stop at arbitrary wavelengths agreed by anatomy; it opens and closes on the two endpoints of a single lattice interval. The window we see through is itself a lattice node.

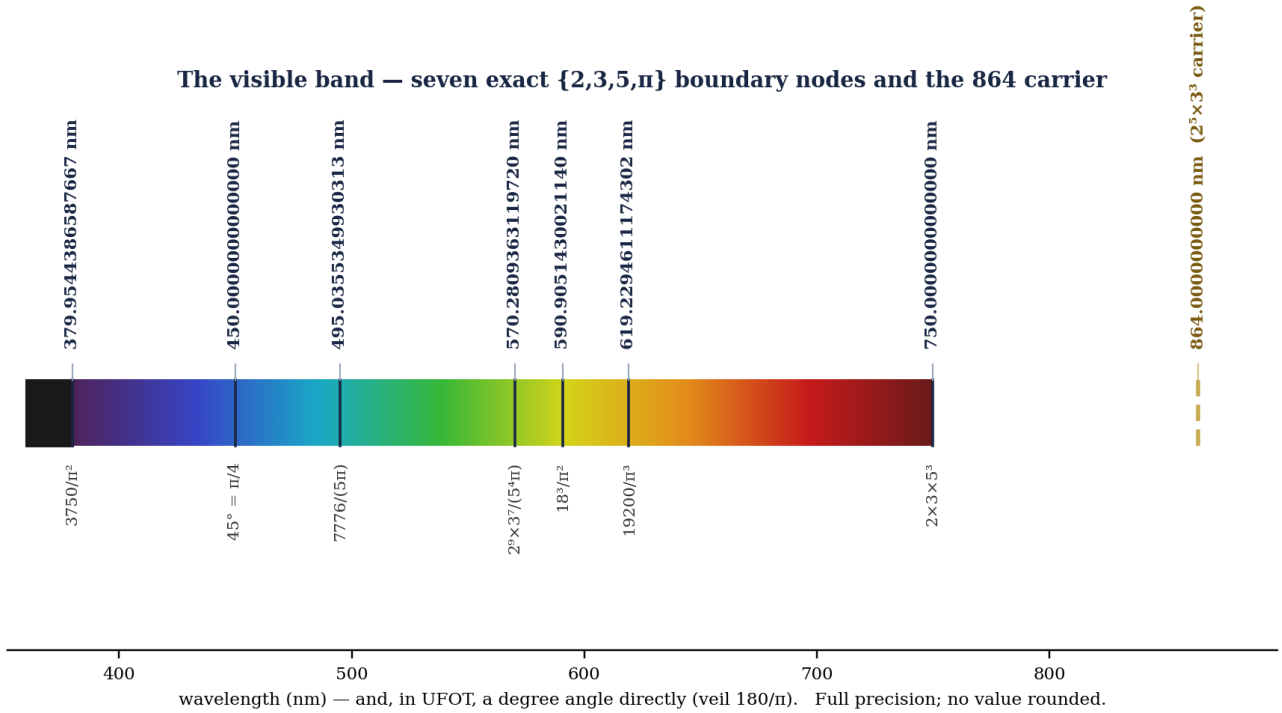
16. The Turn-State reading — the bare radian is the world

The radian key (Section 6) gives each boundary its bare value; the **Turn-State** reading carries that value to the register's own physical scale, and the result lands on the world itself (Fig. 7). Blue/Cyan's radian $8.640000000000 \times 10^4$ = **86,400** — the solar day in seconds, $2^7 \times 3^3 \times 5^2$, exact. Green/Yellow's $9.953280000000 \times 10^5$ = **995,328** — the B-DNA helical-turn number, $2^{12} \times 3^5$, exact; and 995,328 ÷ 86,400 = **11.52**, so the DNA helix is precisely 11.52 days of the same turning that makes the solar day. The two boundaries that mark the helix turns (Section 7) are the two that read, at full scale, as the day and the helix — the same structure seen as an angle, a span of time, and a length. UV/Violet's radian 6.631455962162306 is the Planck quantity of action (= $125/6\pi$), the quantum register's own unit, sitting exactly where light hands the spectrum across. A colour boundary is not a shade; it is an address that the day, the molecule of life, and the quantum each recognise as their own.

17. What the colour bands are

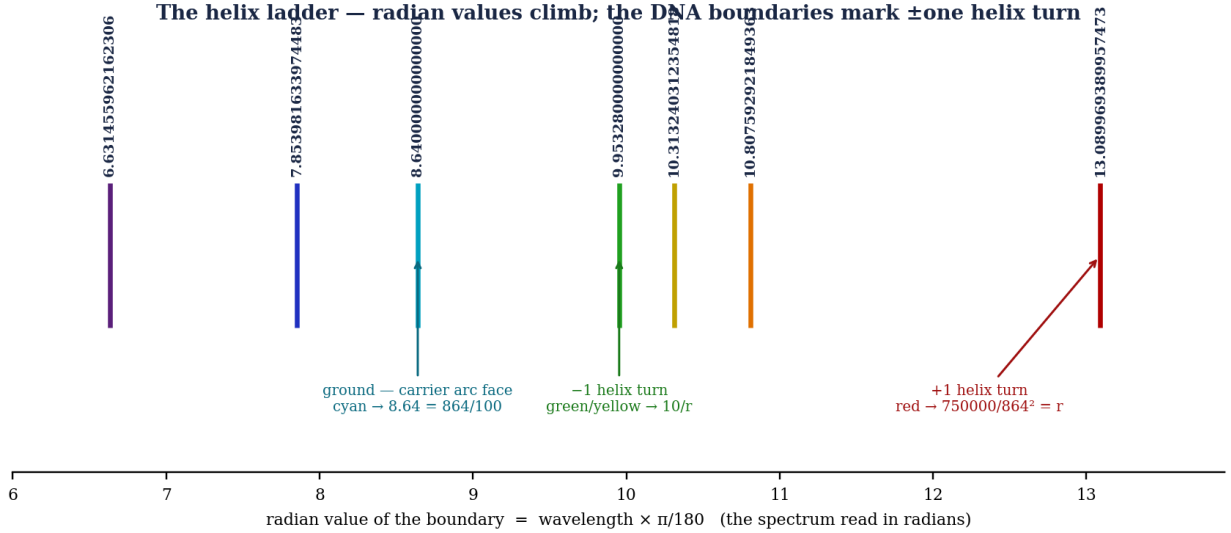
The visible spectrum is the {2,3,5,π} lattice made visible. Its seven boundaries are exact nodes, each carrying an Earth-register value — the day, the DNA helix, body temperature, the Moho sphere, the orbital year, the speed of light. Beneath them runs a helix ladder anchored on the 864 carrier, a two-faced ground from which the red and green/yellow DNA boundaries mark one helix turn each. The carrier's sodium face is the dominant line c_G1; the speed of light is a four-rung cascade climbing by halves to the c_G2 ceiling; and green/yellow's helix term reverts on one road to the Earth's own rotation and on another to that same c_G2, welding colour to the speed of light at both ends. The architecture is uniform: crossing the veil raises every boundary's π-class by exactly one, and the whole band spans precisely $\pi^2/5$ = 1.973920880217872 from violet gateway to red ceiling — vision opens and closes on the two ends of one lattice interval. And read at full scale the bare radian is the world: the day (86,400 s), the DNA helix (995,328 = 11.52 days of turning), the quantum of action. That the central boundary, green/yellow, is the one carrying the DNA helix is no accident — life on a world bathed in this carrier must key itself to the central T-node, and green sits at the heart of the visible band by geometry, not by chance. The prism does not make colour; it decodes a T-map that was already written, and its entry angle is a hydrogen line. None of this is fitted: every value is read from the lattice and given here to full precision, and every one can be reproduced on a calculator. What we call colour is the universe encoding its own structure in light — and reading it in radians, through the veil, is how we hear the note. The figures speak for themselves.

Figure 1. The visible band as a T-map



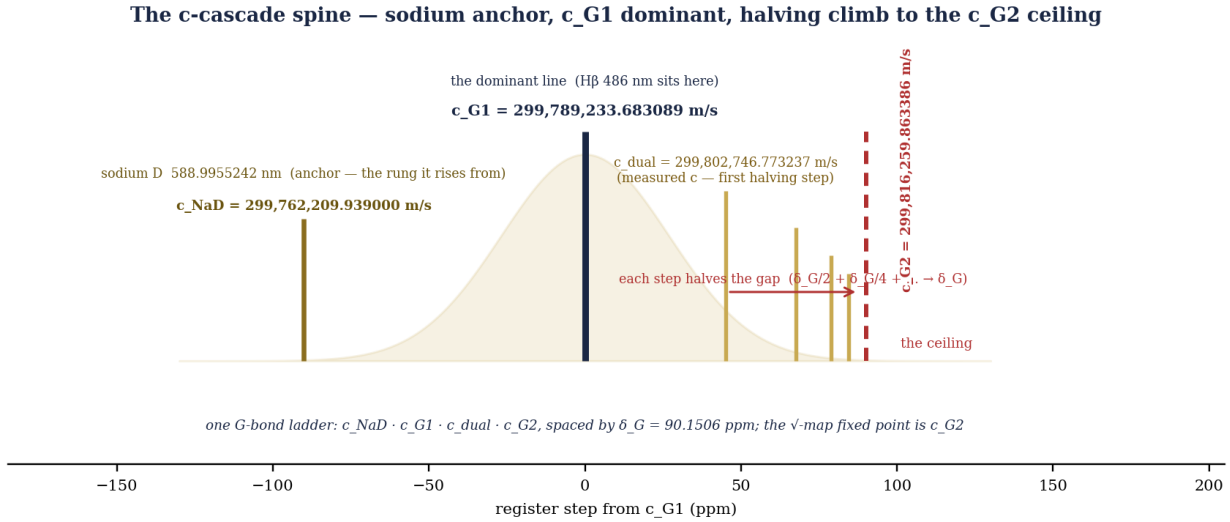
The seven exact {2,3,5,π} boundary nodes at full precision (each a wavelength and a degree angle), and the 864 nm carrier above the visible red edge.

Figure 2. The helix ladder



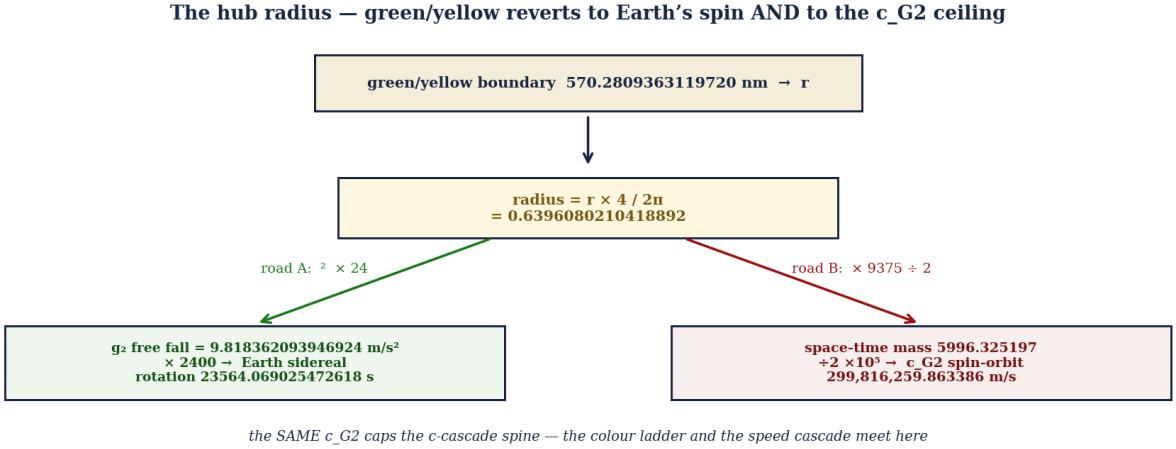
Each boundary read in radians (× π/180). The values climb across the band; the two DNA boundaries are the helix-turn rungs — cyan the ground's arc face (8.64), green/yellow one inverse turn (10/r), red one turn (r).

Figure 3. The speed-of-light cascade (the spine)



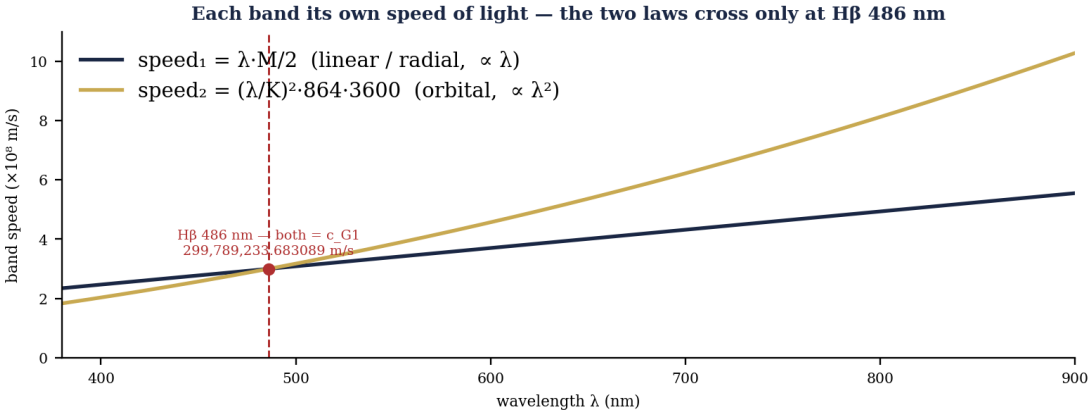
The four rungs c_NaD · c_G1 · c_dual · c_G2, one G-bond step δ_G = 90.1506 ppm apart. Sodium is the anchor at c_G1; the halving climb (slope-½ √-map) approaches the c_G2 ceiling. The single number usually quoted is the measured midpoint c_dual.

Figure 4. The hub radius — colour welded to the speed cascade



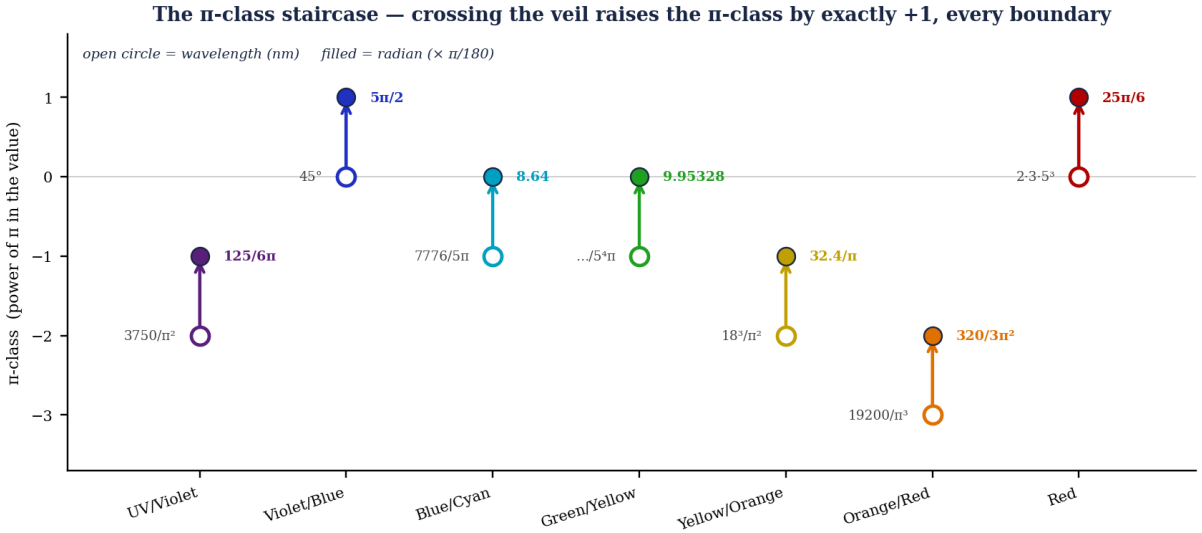
Green/yellow's helix term gives the radius 0.6396080210418892, which reverts on one road to the Earth's sidereal rotation (23564.069025472618 s) and on another to c_G2 — the same ceiling that caps the cascade.

Figure 5. Each band its own speed of light



The linear (∝λ) and orbital (∝λ²) band-speed laws cross only at Hβ 486 nm, where both equal c_G1 = 299,789,233.683089 m/s. 486 is the light-equalisation fixed point of the spectrum.

Figure 6. The π-class staircase



Each boundary as a wavelength (open circle) and as a radian (filled). Crossing the veil — the single operation × π/180 — raises the π-class by exactly one for every boundary, because π/180 carries one power of π and the 180 = 2²×3²×5 is pure {2,3,5}.

Figure 7. The Turn-State reading

The Turn-State reading — the boundary radian at full scale lands on the world

boundary	radian value	scale	lands on	the Earth-register quantity
Blue / Cyan	8.640000000000	× 10^{4}	**86 400**	the solar day in seconds (2⁷×3³×5²)
Green / Yellow	9.953280000000	× 10^{5}	**995 328**	the B-DNA helix turn (2¹²×3⁵ = 11.52 × 86 400)
UV / Violet	6.631455962162	× 10^{-34}	**6.631455962…**	the Planck quantity of action (125/6π)

The same radian read at the register's own scale: the bare boundary IS the day, the DNA helix, the quantum of action.

The bare boundary radian carried to the register's own scale: Blue/Cyan × 10⁴ = 86,400 (the solar day), Green/Yellow × 10⁵ = 995,328 (the DNA helix turn = 11.52 days), UV/Violet = the Planck quantity of action. The boundary is an address the day, the molecule of life, and the quantum each read as their own.

Table 1. The seven boundaries and the carrier — full precision (big to small)

Boundary	Wavelength (nm)	Lattice form	Radian (×π/180)	Earth-register value
White carrier	**864.0000000000000**	$2^5 \times 3^3$	—	free fall g_1 = 9.817477042468; ground (864/864 = 1)
Red upper	**750.0000000000000**	$2 \times 3 \times 5^3$	13.089969389957473	lands on 868.0555555555556 = $5^6/18$ = 864×r — one helix turn above ground
Orange / Red	**619.2294611174302**	$19200/\pi^3$	10.807592921849363	Moho sphere 20000/π
Yellow / Orange	**590.9051430021140**	$18^3/\pi^2$	10.313240312354818	body temperature 36.864°C
Green / Yellow	**570.2809363119720**	$2^9 \times 3^7/(5^4\pi)$	9.953280000000000	DNA helical turn (1/r) → Earth sidereal rotation 23564.069025472618 s
Blue / Cyan	**495.0355349930313**	7776/(5π)	8.640000000000000	solar day — carrier arc face
Violet / Blue	**450.0000000000000**	45° = π/4	7.853981633974483	right-angle bisector (5π/2)
UV / Violet	**379.9544386587667**	$3750/\pi^2$	6.631455962162306	Planck quantity (= 125/6π)

Every figure is Earth's reading; the lattice form is invariant, the numbers register-local. The radian column is the helix ladder of Fig. 2.

Table 2. The Loop run on every boundary — one engine, six readings

The same Loop that walks the proton and the refractive index walks each colour boundary. Read the wavelength as a quantity and turn the handle: × $\pi^2/8$ gives a mass (kg), ÷ 2 a spin-orbit speed (m/s), ÷ K (K = $2^6 \times 3^5/100\pi$ = 49.50355349930312) a free-fall rate (m/s), × 2π a frequency (Hz), ÷ 24 an energy (J). Nothing is fitted — every figure falls out of the one boundary number.

Boundary	λ (nm)	Mass ×π^2/8 (kg)	Spin-orbit ÷2 (m/s)	Free fall ÷K (m/s)	Frequency ×2π (Hz)	Energy ÷24 (J)
White carrier	**864.0000000000**	1065.9172753	532.9586377	17.453292520	109.662271123	0.727220522
Red	**750.0000000000**	925.2754126	462.6377063	15.150427535	95.192943683	0.631267814
Orange / Red	**619.2294611174**	763.9437268	381.9718634	12.508788104	78.595033626	0.521199504
Yellow / Orange	**590.9051430021**	729.0000000	364.5000000	11.936620732	75.000000000	0.497359197
Green / Yellow	**570.2809363120**	703.5559049	351.7779524	11.520000000	72.382294739	0.480000000
Blue / Cyan	**495.0355349930**	610.7256119	305.3628059	10.000000000	62.831853072	0.416666667
Violet / Blue	**450.0000000000**	555.1652476	277.5826238	9.090256521	57.115766210	0.378760688
UV / Violet	**379.9544386588**	468.7500000	234.3750000	7.675296253	48.225308642	0.319804011

The clean landings are the signature: Yellow/Orange → mass 729.0000000 (= 3^6), spin-orbit 364.5000000 (= $3^6/2$, the Balmer series limit), frequency 75.0000000. Blue/Cyan → free fall 10.000000000 exactly, frequency 20π = 62.831853072, energy 5/12 = 0.416666667. Green/Yellow → free fall 11.52 (= 288/25), energy 12/25 = 0.480000000. UV/Violet → mass 468.7500000 (= 1875/4). White carrier → free fall 50π/9 = 17.453292520. The boundaries are not just colours; they are addresses every register can read.

Table 3. The hidden values — every boundary divided by the 864 carrier

Section 13 lays the helix bare for red and green/yellow; here is the same operation run on every boundary, with all its conclusions. Dividing by the carrier strips the {2,3} carrier structure and exposes the value beneath — and every boundary lands on a named Earth-register quantity: the veil, the 660 km discontinuity, the DNA helix turn, Mercury's year.

Boundary	λ ÷ 864	Lattice	What the hidden value is
White carrier	**1.000000000000**	1	the ground state — the carrier divided by itself
Red	**0.868055555556**	$5^3/(2^4\times3^2)$	the DNA helical-turn cosine; × 1000 = 868.0555555556 = 864 × r = $5^6/18$ — one helix turn above the ground
Orange / Red	**0.716700765182**	$200/(9\pi^3)$	$2^3\times5^2/(3^2\pi^3)$ — the Moho face beneath the carrier
Yellow / Orange	**0.683917989585**	$27/(4\pi^2)$	$3^3/(2^2\pi^2)$ — the body-temperature face beneath the carrier
Green / Yellow	**0.660047379990**	$6^4/(5^4\pi)$	× 1000 = 660.0473799907 = the 660 km mantle discontinuity (10368/5π)
Blue / Cyan	**0.572957795130**	$9/(5\pi)$	= the veil ÷ 100 exactly (180/π = 57.29577951308) — carrier, solar-day node and degree/radian arc are one object
Violet / Blue	**0.520833333333**	25/48	the {2,3,5} node 25/48 — π/4 read through the carrier
UV / Violet	**0.439762081780**	$625/(144\pi^2)$	× 200 = 87.9524163562 = Mercury's orbital period ($5^6/18\pi^2$), in days

Read together with Table 1 (the boundaries) and Table 2 (the Loop), the same seven numbers give three independent sets of conclusions — direct, through the Loop, and through the carrier — and all three agree.

Propositions

P-COLOUR-1 — White light is the T-field carrier at 864 nm (= $2^5 \times 3^3$), above the visible red boundary; the prism unfolds the lattice from the carrier, it does not reveal a mixture.

P-COLOUR-2 — Every colour boundary is an exact {2,3,5,π} node, given to full precision; no boundary value is arbitrary.

P-COLOUR-3 — Each boundary encodes a distinct Earth-register value: UV/Violet→Planck; Violet/Blue→π/4; Blue/Cyan→solar day; Green/Yellow→DNA helix; Yellow/Orange→body temperature; Orange/Red→Moho sphere; Red→orbital year / speed of light.

P-COLOUR-4 — The radian key: read as degrees and convert to radians (×π/180) and each boundary IS its value — UV/Violet 6.631455962162306 (Planck), Blue/Cyan 8.64 (the day), Green/Yellow 9.95328 (DNA helix).

P-COLOUR-5 — Dispersion: each band travels at its own speed; $\text{speed}_1 = \lambda M/2$ ($\propto\lambda$) and $\text{speed}_2 = (\lambda/K)^2 \cdot 864 \cdot 3600$ ($\propto\lambda^2$) cross only at Hβ 486 nm, both = c_G1 = 299,789,233.683089 m/s.

P-COLOUR-6 — Prism entry: cos(48.99688950°) = 0.6561000000 = $3^8/10^4$ = Hα; internal node 30° = 2×3×5; the entry angle pins white-light speed to c_G1.

P-COLOUR-7 — Rainbow: for water n = 4/3, $\cos^2(i) = (n^2-1)/3 = 7/27$ and $\sin^2(r) = 5/12$, primary bow $\theta = 4r-2i \approx 42.03°$. The 7 is $2^4-3^2 = 16-9$, a difference of {2,3} powers — the lattice making an integer from its own grammar, not a prime factor. Glass (3/2) and water (4/3) are {2,3}-dual (product 2); the single internal reflection mirror-reverses the colour order against a prism.

P-COLOUR-8 — The π-class staircase: the radian key (× π/180) raises the π-class of every boundary by exactly one, since π/180 carries one power of π and $180 = 2^2 \times 3^2 \times 5$ is pure {2,3,5}. π-class(radian) = π-class(nm) + 1 for all seven boundaries, without exception.

P-COLOUR-9 — The span: the whole visible band, red ceiling ÷ violet gateway, is exactly 750 ÷ (3750/π²) = π²/5 = 1.973920880217872 (0.0 ppm). Vision opens and closes on the two endpoints of one {2,3,5,π} interval.

P-HELIX-1 — The 864 carrier is a two-faced ground: white 864/864 = 1; cyan × π/180 = 8.64 and cyan ÷ 864 × 100 = 180/π (the veil).

P-HELIX-2 — Red = +one helix turn: $750000/864^2 = 5^6/(2^6 \times 3^5) = r = 1.004693930041$ ($864^2 = 2^{10} \times 3^6$). Red lands on 864×r = $5^6/18$ = 868.0555555555556 — one turn above the 864 ground.

P-HELIX-3 — Green/Yellow = −one helix turn: radian value 9.953280000000000 = 10/r; × veil = 570.2809363119720 nm.

P-HELIX-4 — Sodium D = the dominant line: 589.0486225481 = $g_1 \times 60 = 375\pi/2 \rightarrow g_1 = 9.817477042468 \rightarrow g_1^2 \cdot 864 \cdot 3600$ = c_G1 = 299,789,233.683089; measured face 588.9955242 = c_NaD = 299,762,209.939000.

P-HELIX-5 — The speed of light is a four-rung √-map cascade c_NaD·c_G1·c_dual·c_G2 stepped by δ_G = 90.1506 ppm; fixed point c_G2 = 299,816,259.863386.

P-HELIX-6 — The hub radius $r \cdot 4/2\pi = 0.6396080210418892$ reverts to Earth ($^2 \cdot 24 = g_2 = 9.818362093946924$; ·2400 = 23564.069025472618 s) and to the ceiling ($\cdot 9375/2 \cdot 10^5$ = c_G2). The colour ladder and the speed cascade meet at c_G2.

P-HELIX-7 — Each boundary has three register faces one δ_G apart, via $c = \lambda \times 8\pi \times 10^7/\text{cyan}$. Yellow/Orange: g_1 face = $3^{10}/100$ = 590.4900000000 nm (→ c_G1, π^2 cancels); g_2 face 590.5432330298 (→ c_G2); lattice face $18^3/\pi^2$ = 590.9051430021140 (→ c = 3×10^8 exact, frequency 7.5).

P-HELIX-8 — Orange/Red $19200/\pi^3$ is its g_1 face: $(3\pi^2/320) \times 16000/2\pi/24 = 75\pi/24 = 25\pi/8 = g_1 = 9.817477042468$ m/s² exactly (π^2 cancels); g_2 face 619.1736422400 nm. Both previously-open boundaries are closed on their register faces.

P-LOOP-1 — One engine reads every boundary (Table 2). Each wavelength, taken as a quantity, mints six register faces: $\times\pi^2/8 \rightarrow$ mass (kg); ÷2 → spin-orbit (m/s); ÷K (K = $2^6 \times 3^5/100\pi$ = 49.50355349930312) → free fall (m/s); ×2π → frequency (Hz); ÷24 → energy (J). The landings are exact — Yellow/Orange mass 729 = 3^6 and spin-orbit 364.5 = $3^6/2$ (the Balmer limit); Blue/Cyan free fall 10 exactly, frequency 20π, energy 5/12; Green/Yellow free fall 11.52 = 288/25, energy 12/25; UV/Violet mass 468.75 = 1875/4; White carrier free fall 50π/9 = 17.453292520. A colour is an address, not a shade.

P-TURN-1 — The Turn-State reading: the bare boundary radian carried to its register's own scale lands on the world. Blue/Cyan $8.640000000000 \times 10^4 = 86{,}400 = 2^7 \times 3^3 \times 5^2$ (the solar day, s); Green/Yellow $9.953280000000 \times 10^5 = 995{,}328 = 2^{12} \times 3^5$ (the DNA helix turn = 11.52 × 86,400); UV/Violet 6.631455962162306 = 125/6π (the Planck quantity of action). The day, the molecule of life and the quantum each read the boundary as their own.

References

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

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[3] S. Daubney, *The Tau-Cascade* (c_NaD·c_G1·c_dual·c_G2, the √-map fixed point); *How Light Travels*; *What Science Calls Gravity*. The Daubney Foundation (2026).

[4] Schott AG, Optical Glass Data Sheets: BK7 Sellmeier Coefficients (2009); M. Daimon & A. Masumura, Appl. Opt. 46, 3811 (2007) (water); G. Ghosh, Opt. Commun. 163, 95 (1999) (calcite, quartz).

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The Conversion Loop — the gears between the faces

Every value in this paper is one T-value read in different units. Apply the fixed gear below to move between any two faces and reproduce the step yourself — this is the same loop that walks the proton, the refractive index and each colour boundary (Table 2).

Step (one face → another)	Operator (number-first)	Lattice
energy (eV) → energy (kJ)	**÷ 10368**	$2^7 \times 3^4$
energy (kJ) → wavelength λ	**÷ 36**	$2^2 \times 3^2$
wavelength λ → free fall g (T-flow)	**÷ 49.50355349930312**	3888/25π
free fall g → frequency f	**× 6.283185307179586**	2π
free fall g → energy (joules)	**÷ 24**	$2^3 \times 3$
wavelength λ → mass (λ-door)	**× 1.2337005501361697**	$\pi^2/8$
energy (eV) → circumference C	**÷ 31104**	$2^7 \times 3^5$
circumference C → mass (circ-door)	**÷ 22.00157933302361**	1728/25π
free fall g → speed of light c	**c = g² × 3110400**	$864 \times 3600 = 2^9 \times 3^5 \times 5^2$

Direct number-first laws: mass↔energy $E = 6.822485557 \cdot m$ ($m = 1.465741469 \cdot E$); mass↔wavelength $\lambda = 0.8105694691 \cdot m = 8m/\pi^2$ ($m = 1.2337005501 \cdot \lambda = \pi^2\lambda/8$); $eV = 373248 \cdot \lambda$ ($= 2^9 \times 3^6$); mass→frequency $f = 0.1028806584 \cdot m$ ($= 25/243$). The loop above is intradimensional; the one interdimensional step is radial-mass-squared (mass ÷ 9375, then square).

A note on the numbers

The values in this paper are written as plain numbers — not pinned to units, and not carried to a particular power of ten. This is not loose notation; it is the physics. Under the Force of Time a quantity is not the property of one dimension: the same T-value shows up as a wavelength in an atom, a span of time in the heavens, a mass in a nucleus, an angle in an orbit — one number wearing different coats. That is why a hydrogen line in nanometres can meet a planet's turning in arcseconds and land on the same value: they were never separate quantities. We therefore do not solve for a result "to the power of" anything in one register and stop. The lattice number is the real thing, and it lives at once across every register — subatomic, atomic, celestial, galactic. The unit and the power of ten are only the costume the number wears in whichever dimension you read it from.

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