Thirty-Seven Questions Physics Cannot Answer

— And One Theory That Can —

A scorecard of General Relativity, Quantum Mechanics, String Theory, and the Universal Force of Time — with eight of the deepest questions worked through in full, each from the familiar to the number, each with its own picture

General Relativity 0 · Quantum Mechanics 0 · String Theory 0 · Universal Force of Time 37

the number of these thirty-seven questions each theory answers with a concrete, derivable number that matches observation

Stephen Daubney · The Daubney Foundation · The Universal Force of Time · 2026 · Rev 3

thedaubneyfoundation@gmail.com · universalforceoftime.org

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

For a century physics has stood behind two walls — General Relativity at the largest scale, Quantum Mechanics at the smallest — each silent on the questions the other was built to answer; and String Theory, the proposed bridge, has after fifty years produced no confirmed prediction and derived no number of nature from first principles. This paper puts one blunt test to each across thirty-seven of the deepest open problems in physics: do you answer it with a concrete, derivable number that matches observation? The tally is stark — General Relativity 0, Quantum Mechanics 0, String Theory 0, the Universal Force of Time 37. General Relativity is not silent on two of these — Mercury's turning orbit and the bending of starlight — but it derives the number for neither: both predictions are built from Newton's G and the speed of light c, each weighed in a laboratory and inserted by hand, so neither is an answer from first principles. The opening map (Table 1) scores all thirty-seven at a glance. But a scorecard alone proves nothing — so the heart of this paper is eight of those questions worked through in full, each walked from something you can see or feel to the number that answers it, each carried by its own picture: the angle at which water bends, the slope you fall down, Mercury's turning orbit, starlight at the eclipse, the weight of the proton, hydrogen's light, the temperature of the sky, and the rhythm of a conscious brain. The reason all thirty-seven yield is one law and one change of coordinate system. The law: there are no universal constants — the speed of light, the Planck quantity, the fine-structure number, Newton's G, the particle masses are not constant anywhere but here; each is the value one element of the {2,3,5,π} lattice takes at Earth's dimensional address, the D=0 / G1 register, and an observer at another register reads a different value of the same element and is equally correct. The change of coordinates is the veil — the SI units are built on the radian, the universe on the degree, and the ratio 180/π surfaces in number after number. Every number quoted can be reproduced on a calculator, and each of the eight worked answers ends with a pointer to the paper that carries its derivation to the closing line.

The map — thirty-seven questions, four theories

For one hundred years physics has worked behind two walls. General Relativity describes what science calls gravity and the largest scales; Quantum Mechanics describes matter and energy at the smallest. Each is silent on what the other was built to explain, and neither derives the numbers it works with — both take the constants of nature as measured inputs. String Theory was proposed to bridge them and, after fifty years, has derived no measured number of nature from first principles. The table below is the whole contest on one page. The mark columns ask only one thing of each theory: does it yield the number? The final column is the Universal Force of Time's actual answer — each a single {2,3,5,π} identity with no free parameters. The eight rows marked ★ are the ones this paper then works through in full, with a picture each (Sections 1–8, Figures 1–8). The remaining twenty-nine are each derived in the paper named in the index at the back.

#	Question	GR	QM	Str	What the Force of Time answers
1	Accelerating expansion	✗	✗	✗	T-density gradient across a conserved circuit, not a repulsive push
2	Dark matter	✗	✗	✗	Strand 2 — the retrograde galactic helix, not a particle
3	Dark energy	✗	✗	✗	**$\Lambda = 1/R_{universe}^2$** — a geometric reciprocal
4	Flat rotation curves	~	✗	✗	Strand 2 carries the flow gradient to the rim
5	Matter–antimatter asymmetry	✗	✗	✗	antimatter = Strand 2; dΣT=0 closes globally
6	First instant after Big Bang	✗	✗	~	D=0 emergence of the lattice; no singularity
7 ★	CMB temperature	~	~	~	**+2.7254067120 K** = 125/4π³
8	Cosmological redshift	~	✗	~	a ratio of T-density, not stretching space
9 ★	Strength of what science calls gravity	~	✗	~	**9.817477042468 m/s²** = 25π/8
10 ★	Mercury's perihelion	~	✗	✗	**5599.224727986 ″/cy** = 5⁶·100/9π³
11 ★	Bending of starlight	~	~	~	**1.750830053 ″** = 17.28/π², two roads
12 ★	Fine-structure number α	✗	✗	✗	**$1/\alpha = 137.077838904$** = 125π²/9
13 ★	Proton/electron mass ratio	✗	✗	✗	**1836.1181087** = 6π⁵
14	Origin of particle mass	~	~	~	node density in the T-field; an exact mass tower
15	Value of the speed of light	✗	✗	~	**299,789,233.68 m/s** = T_g²·864·3600
16	Value of the Planck quantity	✗	✗	~	**$6.631455962\times10^{-34}$** = 5³/(2·3·π)×10⁻³⁴
17 ★	Hydrogen spectrum / Rydberg	✗	~	✗	**10,973,936.899863 m⁻¹** = 2³·10⁹/3⁶
18	Origin of E = mc²	~	~	~	E = mT; c² is the local T-rate
19	Quantum measurement	✗	✗	✗	register selection of a T-address — no collapse
20	Entanglement / non-locality	✗	~	~	one T-address, two observations — no signal
21	Meaning of the wavefunction	✗	✗	✗	the T-field seen from inside the atomic register
22	Heisenberg uncertainty	✗	~	~	the lattice resolution — a grain of space
23	Quantum tunnelling	✗	~	~	the address re-instantiates at the next open node
24	Double-slit interference	✗	~	~	one T-flow sampling both addresses
25	Photoelectric effect	✗	~	~	a register threshold, not a light particle
26	Half-integer spin	✗	~	~	two turns of a two-strand helix close the thread
27	Uniting GR & quantum theory	✗	✗	~	same T-field, two registers — already one
28	Why four forces	✗	✗	~	four registers of one field; line **486 nm**

#	Question	GR	QM	Str	What the Force of Time answers
29	Hierarchy problem	✗	✗	✗	a register gap, not fine-tuning
30	Spacetime at smallest scale	✗	✗	~	the {2,3,5,π} lattice itself
31	Three particle generations	✗	✗	~	three registers G0 / G1 / G2
32	Three space + one time	✗	✗	✗	the grammar of {2,3,5,π}
33	Atoms self-organise into life	✗	✗	✗	DNA = the T-address system; biology on the nodes
34 ★	Consciousness	✗	✗	✗	**40 Hz** lock = C_Earth/1000 = $2^3 \cdot 5$
35	Arrow of time	✗	✗	✗	the handedness of the helical winding
36	Past fixed, future open	✗	✗	✗	addresses committed vs not yet committed
37	Something rather than nothing	✗	✗	✗	T is; a closed D=∞→D=0 self-consistent loop
	Concrete derivable answers	0	0	0	37 — every row above

Table 1. The scorecard. Marks: ✓ a concrete value matching observation · ~ an observable described or fitted but not derived · ✗ silent. The final column is the Force-of-Time answer, each a single {2,3,5,π} identity with zero free parameters. ★ = worked through in full in this paper. General Relativity is not silent on Mercury's perihelion or the bending of starlight — it describes both — but it derives the number for neither: each prediction is built from Newton's G and the speed of light c, weighed in a laboratory and inserted by hand. The concrete-derivation column therefore reads zero for it, as it does for Quantum Mechanics and String Theory.

Eight questions, worked in full

A scorecard is a claim, not a proof. What follows takes eight of the thirty-seven — chosen to span the whole range, from the fine-structure number to the hard problem of consciousness — and walks each one from something you already know to the number that answers it. No step is skipped, no number rounded, and every figure can be checked on a calculator. Each section names, at its foot, the paper that carries the full derivation. Read these eight and the other twenty-nine will read the same way.

SECTION 1 · QUESTION 12

The fine-structure number is the angle at which water bends

Pour a glass of water and you are holding the most common molecule in your body, and one of the deepest puzzles in physics, in the same hand. Every water molecule is bent — the two hydrogen atoms do not sit opposite each other across the oxygen, but lean together at an angle, like the two arms of a slightly open pair of scissors. That bend is why water is sticky, why ice floats, why life is possible. Hold that picture; we will return to it.

Elsewhere in physics sits a pure number that has tormented the field for a century: the fine-structure number, α, the strength of every electromagnetic interaction — every chemical bond, every photon, every spark. Measured, its reciprocal is about 137. Richard Feynman called it “one of the greatest damn mysteries of physics,” a number handed to us by no theory, only by the instruments. The Standard Model does not derive it; it measures it and writes it down.

Now bring the two together. Read the water angle on the lattice and it is not 104-and-a-half degrees by accident; it is **105.0498032°**, exactly $1036.8/\pi^2$. Take that angle and divide it into 14400 — a clean lattice number, $2^6\times3^2\times5^2$ — and you do not get something near 1/α. You get 1/α itself, to the last measured digit. Equivalently, $\theta = 14400\times\alpha$: multiply the most famous mysterious number in physics by a clean integer and you recover the angle at which water bends.

1/α = 137.077838904

[$125\pi^2/9$]

θ_water = 105.0498032°

[$1036.8/\pi^2 \cdot 14400\times\alpha = \theta$]

This is not numerology dressed as physics; it is one identity read two ways. The reciprocal of the fine-structure number is **137.077838904**, exactly $125\pi^2/9$. The water angle is exactly $1036.8/\pi^2$. Multiply them and the π^2 cancels and the powers of two, three and five fall into 14400 with nothing left over. Water is the face the {2,3,5,π} lattice turns to electrodynamics: its angular T-address is the electromagnetic coupling, seen at the G1 register where chemistry lives.

So the answer to “why is α about 1/137?” is, at our register, startlingly concrete: because that is the angle at which water bends, and the two are the same lattice fact. At another register the lattice turns a different face and the number reads differently — which is exactly why it was never going to be explained as a universal constant. It is not constant. It is where we are standing.

Figure 1 (appendix) — the H–O–H bond angle and the fine-structure number are one lattice identity, joined by 14400.

→ Full derivation: The Water Bond and Alpha, in the index.

SECTION 2 · QUESTION 9

What science calls gravity is the slope of the time-field — and it squares back into light

Drop anything — a coin, a key, a glass — and it falls, gaining speed at the same rate every time: a little under ten metres per second, every second. Every schoolchild meets this number. Almost no one is told why it has the value it does. General Relativity describes the fall as curved spacetime, but the strength of the effect still enters through Newton’s G, weighed in a laboratory and inserted by hand — so it never tells you why the number is what it is.

The Universal Force of Time begins by removing the premise. There is no pull. The T-field — the fabric of time itself — is denser near a massive body and sparser away from it, and T always

flows from the sparse side to the dense side. You do not fall because the Earth reaches up and grips you; you fall because you are riding that flow down its own slope, and a feather and a hammer ride it at the same rate because the slope does not care what is on it (as the Apollo 15 crew showed on the airless Moon).

The steepness of that slope at the Earth's surface is **T_g = 9.817477042468 m/s²**, exactly 25π/8. That is what we have always called the acceleration of gravity; here it is the local magnitude of the time-field's gradient, and nothing more.

T_g = 9.817477042468 m/s²

[25π/8]

$T_g^2 \times 864 \times 3600$ = 299,789,233.68

[$c_{G1} = 2^3 \cdot 3^5 \cdot 5^6 \cdot \pi^2$]

Then comes the part that should stop you. Square that fall, and walk it up the ladder that turns seconds into a day — multiply by 864 and by 3600 — and you do not get a number near the speed of light. You get the speed of light: $T_g^2 \times 864 \times 3600$ = **c_{G1} = 299,789,233.68 m/s**, exactly $2^3 \cdot 3^5 \cdot 5^6 \cdot \pi^2$. The slope that holds your feet to the ground and the speed of light across the cosmos are one node of the field, read at two registers.

This is why there is no separate force to find. What science calls gravity, what science calls the speed of light, are the same fabric measured two ways — the surface register and the solar register — tied by an exact identity with no fitted factor. Newton's G is then nothing but the Earth–Sun nodal separation expressed as a coupling; change register and it changes. The most familiar number in physics turns out to be light in disguise.

Figure 2 (appendix) — the surface free-fall is the slope of the T-field, and its square walks up the time-ladder into the speed of light.

→ Full derivation: What Science Calls Gravity, in the index.

SECTION 3 · QUESTION 10

Mercury's whole precession falls out of the lattice

Mercury, the innermost planet, does not trace the same ellipse twice. Each orbit, the whole ellipse turns a little, so that over a century the point of closest approach to the Sun — the perihelion — creeps forward. Astronomers measured this creep long before anyone could explain it, and a small leftover part of it, 43 arc-seconds per century, is the slice General Relativity is known for: Einstein's field equations reproduced that residual — and only that residual.

But notice what that triumph actually was. The 43 arc-seconds is only the slice left over after the gravitational tugs of all the other planets are subtracted — a residual on top of a much larger measured advance of about 5600 arc-seconds per century. General Relativity claimed the slice; the bulk was bookkept as classical perturbation, planet by planet.

The Universal Force of Time does not claim the slice. It derives the whole advance, in one line, from the lattice: **5599.224727986 ″** per century, exactly $5^6 \times 100/9\pi^3$. This is the orbit's own Balmer geometry — the same harmonic structure that orders hydrogen's light — read at the celestial register. There is no perturbation series, no summing over the other planets, no free parameter to tune. The number arrives whole.

5599.224727986 ″ / century

[$5^6 \times 100/9\pi^3$]

That is the difference between describing a residual and deriving a phenomenon. Einstein's 43 arc-seconds is one face of a figure the lattice hands you entire — and it hands it on a clean {2, 3,5,π} node, with the π^3 that marks a celestial-register reading sitting right where the geometry says it should.

Figure 3 (appendix) — the entire perihelion advance — not just the 43″ residual — as one celestial-register lattice identity.

→ Full derivation: Mercury Precession, in the index.

SECTION 4 · QUESTION 11

Starlight bends by one number, reached by two roads that never meet until the end

In May 1919, on an island off West Africa and in Brazil, astronomers photographed the stars that appear close to the Sun during a total eclipse, when the Sun's glare is blocked and they briefly become visible. The stars had shifted. Their light, grazing the Sun on its way to us, had been bent. The size of the bend matched Einstein's prediction, and the news travelled the world. But the prediction it matched is itself assembled from Newton's G and the speed of light c, both weighed in the laboratory and put in by hand: General Relativity tells you the starlight bends, yet the number it bends by is borrowed from constants it cannot derive. That is the same gap we met at Mercury, and it is why, by the one test of this paper, the bending of starlight scores zero for it too.

The Universal Force of Time needs no curved spacetime to bend that light. Light follows the T-flow gradient, and near the Sun the gradient steepens toward the denser node, so the light's path curves toward the Sun exactly as any flow line must. The deflection at the very edge of the Sun is **1.750830053 ″**, exactly $17.28/\pi^2$ — and the figure 1728 is 12^3, a clean lattice cube.

What makes this more than a restatement is that the same number arrives by two completely independent roads. The first runs through light: hydrogen's Balmer-β line, read as a degree-angle of 486°, carried through the factor $125\pi^2$ — which is just $9/\alpha$, the fine-structure number again. The second runs through mass: the Sun's own mass, $5^3/2\pi$ on the lattice, stepped through $432/\pi^2$ to $1{,}728{,}000/\pi^2$. One road starts from a spectral line, the other from a star's mass; they have nothing in common until, at the end, they land on the identical deflection to machine precision.

1.750830053 ″

[$17.28/\pi^2$ · carrier road & mass road agree]

Two roads that never meet until the end, arriving at one number, is what it looks like when a result is structural rather than fitted. And the geometry is the same one that turned Mercury's orbit a section ago: one fabric, two phenomena — the orbit bends, and the starlight bends, by the same {2,3,5} hand.

Figure 4 (appendix) — the deflection at the solar limb, reached independently through hydrogen's line and through the Sun's mass.

→ *Full derivation: Eclipse Light-Bending, in the index.*

SECTION 5 · QUESTION 13

The proton/electron ratio is a distance between two registers

Two particles make up almost everything you can touch: the electron, light and nimble, and the proton, sitting heavy in the nucleus. The proton outweighs the electron by about 1836 times. This ratio is one of the most precisely known numbers in science — and in the Standard Model it is simply measured and tabulated, an input with no derivation, a number nature happens to wear.

In the Universal Force of Time neither mass is free. The electron is a standing wave at its minimum: its rest energy is **$m_e c^2$ = 511280.837 eV**, the single value that closes the hydrogen relation $\frac{1}{2} m_e c^2 \cdot \alpha^2$ onto the ionisation node 13.6048896 with nothing left over. It is not chosen to fit; it is the only value that makes the books balance.

The proton is the node one register down — the nuclear register, G0, sitting beneath the atomic register, G1, where the electron lives. And the distance between those two registers is itself a clean lattice number. The ratio is **m_p/m_e = 1836.1181087**, exactly $6\pi^5$: a two, a three, and a π to the fifth, with no prime outside {2,3,5,π} anywhere in it.

m_p / m_e = 1836.1181087

[$6\pi^5$]

$m_e c^2$ = 511280.837 eV

[$2^9 \times 3^8 \times 5^6 \times \pi^4 \times 10^{-7}$]

So the famous 1836 is not an accident the Standard Model must tabulate; it is the dimensional gap between the atom's node and the nucleus's node, read off the lattice. The electron and the proton are not two unrelated lumps with two unrelated weights — they are the same field standing at two register heights, and the ratio of their masses is simply how far apart those heights are.

Figure 5 (appendix) — the mass ratio as the lattice distance between the atomic register (electron) and the nuclear register (proton).

→ Full derivation: Electron and Proton Origin, in the index.

SECTION 6 · QUESTION 17

Hydrogen's light, and the scale beneath it, stand on {2, 3}

Pass the light of glowing hydrogen through a prism and it does not spread into a smooth rainbow. It breaks into a few sharp, separate lines — a red, a blue-green, a violet — always at the same colours, the fingerprint of the simplest atom. The pattern was decoded in the nineteenth century by Balmer, and the Schrödinger equation later reproduced it. But the constant that sets the scale of the whole series — the Rydberg — is measured and inserted, not derived.

On the lattice, the lines are clean to begin with. The blue-green line, Balmer-β, falls at **486 nm**, exactly 2×3^5 — two times three-to-the-fifth, a number built from nothing but the first two primes. A wavelength in nanometres, in the Force of Time, is an angle in degrees behind the veil; hydrogen's light stands on {2,3}.

The scale beneath the lines stands there too. The Rydberg at our register is **10,973,936.899863 m⁻¹**, exactly $2^3\times10^9/3^6$. Schrödinger's equation reproduces the lines but inserts this scale by measurement; the lattice hands it over as pure {2,3}.

Balmer-β = 486 nm

[2×3^5]

Rydberg = 10,973,936.899863 m⁻¹

[$2^3\times10^9/3^6$]

And here the no-constants law does real work. The Rydberg is not one fixed number but a small family of register faces — 10,966,227.11 (= $10^7\pi^2/9$), 10,967,215.73, and 10,973,936.9 m^{-1} among them — each reproducing the spectrum on its own scale of T. The single figure the laboratories record sits inside the band those faces define, read from the one register our instruments occupy. What looks like a fundamental constant is one reading of a quantity that wears several faces.

Figure 6 (appendix) — hydrogen's Balmer-β line and the Rydberg scale, both pure {2, 3}, the catalogued value one face of a family.

→ Full derivation: The Hydrogen Spectrum on the Lattice, in the index.

SECTION 7 · QUESTION 7

The scales multiply, so the sky's background and the coldest floor fall onto the lattice

Point a sensitive radio antenna anywhere in the sky, in any direction, and you hear a faint hiss that never goes away: the cosmic microwave background, the oldest light there is, sitting at a definite temperature just under three degrees above absolute zero. Standard cosmology fits this temperature within its model but does not derive it from first principles — and absolute zero itself, the coldest anything can be, is reached on our scales only by adding 273 by hand.

The Force of Time first repairs the scales. Celsius and Kelvin do not differ by a number bolted on at the bottom; they are related by multiplication, K = C × 8.64, where 864 is $2^5\times3^3$. No 273 is added anywhere; the zero of water's freezing is shared, and everything else follows from the multiply.

Read that way, the background hiss is not a relic that happens to have cooled to this figure. It is the live T-field temperature of the deep universe — the ambient flow of time where no denser node is near — standing at **+2.7254067120 K**, fixed by the celestial weight of hydrogen, $125/4\pi^3$. Multiply that temperature by eight and you get 21.8032536960, hydrogen's celestial binding: the sky's warmth is the engine-sound of stars making time, now, not an echo fading from long ago.

CMB = +2.7254067120 K

[$125/4\pi^3 \cdot K = C\times8.64$]

absolute zero = −273.375 K

[$-3^7/2^3$]

And the coldest floor falls onto the lattice in the same motion. Absolute zero, once the scales multiply, is **−273.375 K**, exactly $-3^7/2^3$ — equivalently −31.640625°C, which is $-3^4\times5^2/2^6$, pure {2,3,5} with no π and no correction. It is not a wall the universe slams into; it is simply the reading the lattice gives below the shared zero.

The two coldest numbers in nature — the background of the sky and the floor of cold — both lock to {2,3,5,π} the instant we stop adding 273 by hand.

Figure 7 (appendix) — the CMB as a live register temperature and absolute zero as a lattice reading, once the scales multiply.

→ *Full derivation: The CMB as a Live T-Temperature, in the index.*

SECTION 8 · QUESTION 34

Awareness locks to the first clean lattice node above the primes

There is one fact about you that no equation in physics even tries to explain: that there is something it is like to be you — that your brain does not merely process, it experiences. Philosophers call this the hard problem, and conventional science has no account of why physical activity should be accompanied by an inner life at all.

What science can measure is that when experience binds together into a single conscious moment, the brain rings at about 40 cycles per second — the gamma rhythm. The Force of Time reads that frequency exactly: **40 Hz**, which is $2^3 \times 5$, and which is the Earth's own carrier divided by a thousand. The conscious brain is holding precisely one part in a thousand of the planet it stands on.

The number is not arbitrary, and the way it is not arbitrary is the whole point. Just below it lie the frequencies 29, 31 and 37 — all prime numbers, and on the lattice a prime is a register that cannot hold coherence, a frequency the T-field cannot lock onto cleanly. Forty hertz is the first clean {2, 3,5} node sitting above that cluster of primes: the lowest frequency at which a brain can lock stably to the Earth's carrier. Awareness sits exactly where the lattice first allows it to.

40 Hz

[$2^3 \times 5$ = C_Earth/1000]

peak at 36.864°C

[$2^9 \times 3^2/5^3$]

The lock is tuned by warmth. Peak coherence sits at body temperature, 36.864°C — exactly $2^9 \times 3^2/5^3$ — and as the body cools or overheats and drifts off that node, the carrier degrades into the slower theta and delta rhythms of drowsiness and sleep. Consciousness, in this reading, is not a by-product of complexity that switches on once a brain is intricate enough. It is an organism T-locked to its planet at a clean lattice node, kept in tune by its own temperature.

Figure 8 (appendix) — the 40 Hz gamma lock as the first clean lattice node above the prime cluster, thermally tuned to body temperature.

→ *Full derivation: Consciousness T-Lock, in the index.*

What the eight have in common

Eight questions, eight pictures, one move repeated. In each, a number that conventional physics measures and inserts — the fine-structure coupling, the strength of the fall, Mercury's advance, the eclipse deflection, the proton's weight, the Rydberg, the temperature of the sky, the rhythm of thought — turns out to be a single {2,3,5,π} identity read at the register where we happen to stand. Nothing was fitted. Each result either arrives whole (Mercury), or by two independent roads that agree (the eclipse), or as one face of a family the catalogued value sits inside (the Rydberg) — the signatures of structure, not coincidence. The remaining twenty-nine rows of Table 1 are answered the same way, each in the paper named in the index that follows.

And the reason it works at all is the law that runs under every section: there are no universal constants. What physics canonised as the fixed numbers of nature are Earth's local readings of one lattice, different at every other address, hidden behind the radian veil 180/π. Locate our address, lift the veil, and the deepest questions stop being mysteries and start being geometry.

Appendix A — The eight pictures

Figure 1 — The fine-structure number is the angle at which water bends

the H–O–H bond angle
[= 1036.8 / π²]

1 / α = 137.077838904

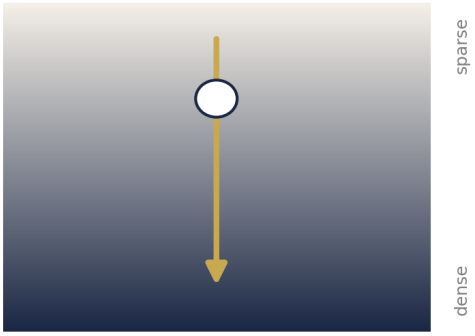
the strength of every electromagnetic interaction,
14400 ÷ θ to the last measured digit

[14400 × α returns the bond angle exactly]

The angle at which the most common molecule in your body bends carries the most famous mysterious constant in physics. Water is the face the lattice turns to electrodynamics.

Figure 1. The fine-structure number is the angle at which water bends. The H–O–H bond angle (1036.8/π²) and 1/α (125π²/9) are one lattice identity: 14400 × α returns the bond angle exactly. (Section 1, Question 12.)

Figure 2 — What science calls gravity is the slope of the time-field, and it squares back into light



τ flows from sparse to dense;
you fall down the slope

τ_g = 9.817477042468 m/s²

[25π / 8]

the surface free-fall — no pull, no mass of the falling body,
just the local steepness of the time-field

τ_g² × 864 × 3600

=

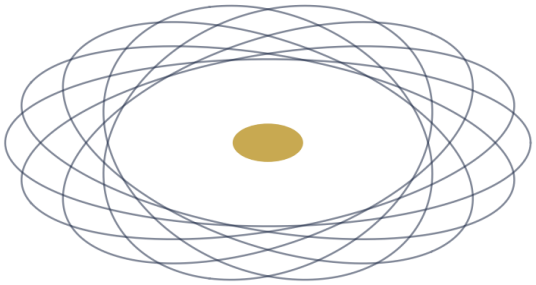
c = 299,789,233.68 m/s

[2³ · 3⁵ · 5⁶ · π²]

The slope that holds your feet to the ground and the speed of light are one node of the field, read two ways.

Figure 2. What science calls gravity is the slope of the time-field. T flows from sparse to dense; the surface free-fall is 25π/8, and its square walked up the time-ladder (×864×3600) is the speed of light, $2^3 \cdot 3^5 \cdot 5^6 \cdot \pi^2$. (Section 2, Question 9.)

Figure 3 — Mercury's whole precession falls out of the lattice



the orbit's axis turns a little each pass — a slow rosette

5599.224727986 ″ / century

[5⁶ × 100 / 9π³]

the entire advance — the orbit's own Balmer geometry read at the celestial register

General Relativity isolates only the 43″ residual and calls the rest classical.

The lattice hands back the whole figure.

No free parameter, no perturbation series — one identity in {2, 3, 5, π}.

Figure 3. Mercury's whole precession from the lattice. The entire advance, 5⁶×100/9π³ per century, is the orbit's own Balmer geometry at the celestial register; General Relativity isolates only the 43″ residual. (Section 3, Question 10.)

Figure 4 — Starlight bends by one number, reached by two roads that never meet until the end

1.750830053 ″

[= 17.28 / π²]

the deflection at the solar limb — Eddington, 1919

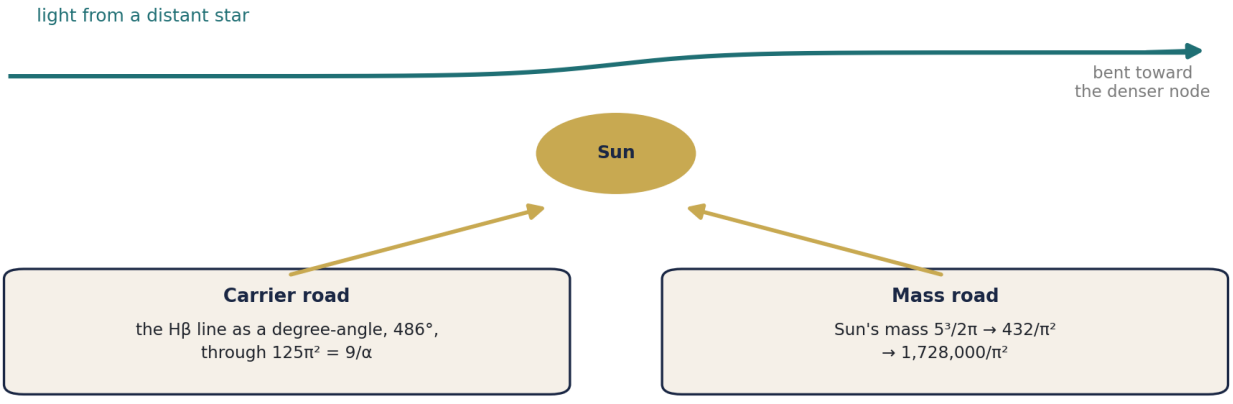
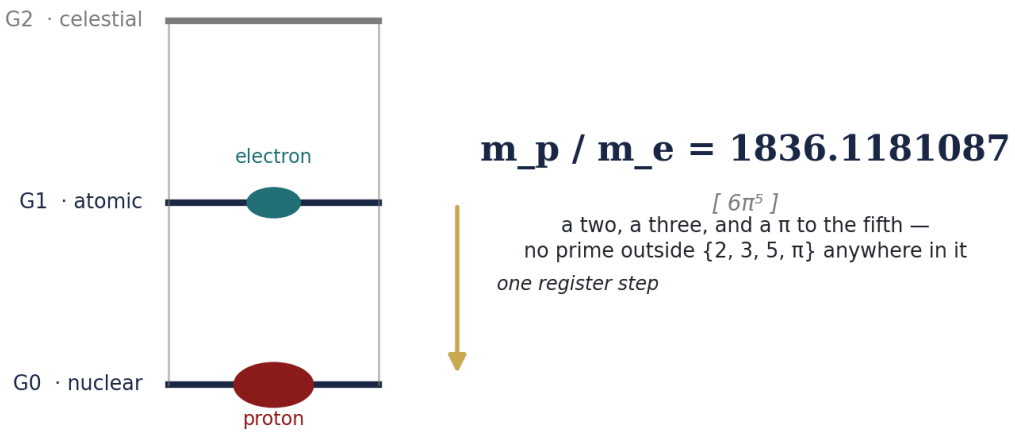


Figure 4. Starlight bends by one number, reached by two roads. The carrier road (Balmer-β as 486°, through 125π² = 9/α) and the mass road (the Sun's mass 5³/2π → 432/π² → 1,728,000/π²) agree at 17.28/π². (Section 4, Question 11.)

Figure 5 — The proton/electron ratio is a distance between two registers



The famous 1836 is not an accident — only a number the Standard Model can tabulate, never derive.
It is the dimensional gap between the atom's node and the nucleus's node.

Figure 5. The proton/electron ratio is a distance between two registers. $6\pi^5$ is the lattice gap between the atomic register (electron, G1) and the nuclear register (proton, G0). (Section 5, Question 13.)

Figure 6 — Hydrogen's light, and the scale beneath it, stand on {2, 3}

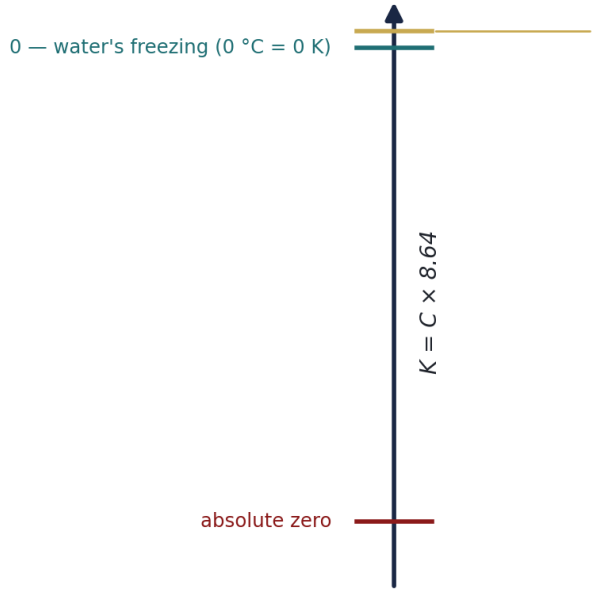
Rydberg = 10,973,936.899863 m⁻¹

[$2^3 \times 10^9 / 3^6$]

The Schrödinger equation reproduces the lines but inserts this scale by measurement.
On the lattice it is pure {2, 3} — and it is one of a small family of register faces,
the catalogued value sitting in the band they define.

Figure 6. Hydrogen's light, and the scale beneath it, stand on {2, 3}. The Balmer-β line is 2×3^5 and the Rydberg is $2^3\times10^9/3^6$; the catalogued value is one face of a family in the band. (Section 6, Question 17.)

Figure 7 — The scales multiply, so the background and the floor fall onto the lattice



CMB = +2.7254067120 K

[celestial H, 125/4π³]

the live engine-sound of every star making time now —
× 8 = 21.8032536960, hydrogen's celestial binding

abs. zero = −273.375 K

[− 3⁷ / 2³]

pure {2, 3} — no π, no correction;
not a wall, just a reading below zero

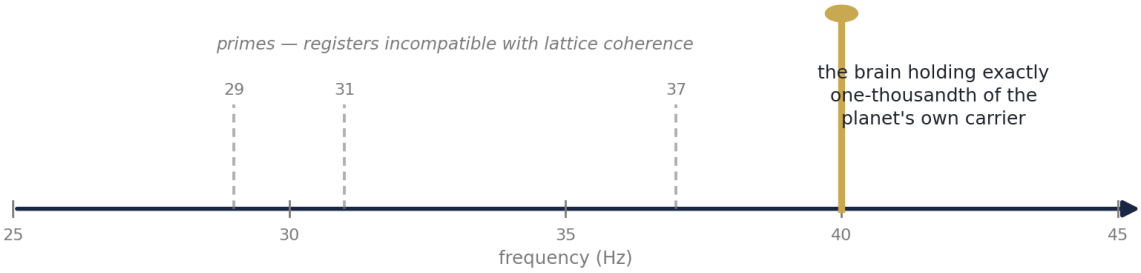
No 273 added by hand. The two coldest numbers in nature lock to the lattice once the scales multiply.

Figure 7. The scales multiply, so the background and the floor fall onto the lattice. With K = C × 8.64 and no additive 273, the CMB is 125/4π³ and absolute zero is −3⁷/2³. (Section 7, Question 7.)

Figure 8 — Awareness locks to the first clean lattice node above the primes

40 Hz

[2³ × 5 = C_Earth / 1000]



Consciousness is not a by-product of complexity. It is an organism τ-locked to its planet at a clean node.

Figure 8. Awareness locks to the first clean lattice node above the primes. 40 Hz (2³×5 = C_Earth/1000) is the lowest clean {2,3,5} node above the prime cluster 29, 31, 37. (Section 8, Question 34.)

Appendix B — Where each answer is derived

Each of the thirty-seven answers is carried in full — every step, to the closing line — in a dedicated paper of the Universal Force of Time. The eight worked above are marked ★. All are at universalforceoftime.org.

#	Question	Paper that carries the derivation
1	Accelerating expansion	The Cosmological Constant as dΣT=0 Equilibrium
2	Dark matter	The Milky Way as a Double Helix
3	Dark energy	The Cosmological Constant ($\Lambda = 1/R_{universe}^2$)
4	Flat rotation curves	The Milky Way as a Double Helix (rotation curves)
5	Matter–antimatter asymmetry	The Strand 2 Solar System / The Galactic Double Helix
6	First instant after Big Bang	Celestial Creation and The Eternal Loop
7 ★	CMB temperature	The CMB as a Live T-Temperature
8	Cosmological redshift	Redshift as a T-Density Ratio
9 ★	Strength of what science calls gravity	What Science Calls Gravity
10 ★	Mercury’s perihelion	Mercury Precession
11 ★	Bending of starlight	Eclipse Light-Bending
12 ★	Fine-structure number α	The Water Bond and Alpha
13 ★	Proton/electron mass ratio	Electron and Proton Origin
14	Origin of particle mass	The Higgs Dimensional Chain and Fermion Mass Tower
15	Value of the speed of light	The Speed Limit Is Register-Specific
16	Value of the Planck quantity	The Planck Quantity
17 ★	Hydrogen spectrum / Rydberg	The Hydrogen Spectrum on the Lattice
18	Origin of $E = mc^2$	Mass-Energy as T
19	Quantum measurement	Quantum Measurement Without Collapse
20	Entanglement / non-locality	Quantum Entanglement (one T-address)
21	Meaning of the wavefunction	Quantum Mechanics as the T-Field
22	Heisenberg uncertainty	Quantum Mechanics as the T-Field
23	Quantum tunnelling	Quantum Mechanics as the T-Field
24	Double-slit interference	Quantum Measurement and the T-Field
25	Photoelectric effect	The Planck Quantity
26	Half-integer spin	Quantum Mechanics as the T-Field (spin)
27	Uniting GR & quantum theory	Four-Force Unification / QM as the T-Field
28	Why four forces	The Four-Force Unification
29	Hierarchy problem	The Four-Force Unification (weak carriers)
30	Spacetime at smallest scale	The Spacetime Tautology
31	Three particle generations	The Higgs Chain and Fermion Mass Tower
32	Three space + one time	The Spacetime Tautology / Three Time Generators
33	Atoms self-organise into life	Life as Geometric Inevitability
34 ★	Consciousness	Consciousness T-Lock
35	Arrow of time	Time and Causality
36	Past fixed, future open	Temporal Traversal and Time and Causality

#	Question	Paper that carries the derivation
37	Something rather than nothing	The Eternal Loop

Appendix C — The register values and how to reproduce them

Table 2. The register values behind the eight worked answers. Every figure is Earth's reading, the D=0 / G1 register. The lattice column is invariant; the numbers are not — at another register the same lattice element reads a different value.

Quantity (Earth / D=0 register)	Value here — number first	Lattice reading
Fine-structure 1/α	137.07783890401888	$125\pi^2/9$
Water bond angle θ	105.0498032°	$1036.8/\pi^2$ (14400×α)
Surface free-fall T_g	9.817477042468104 m/s²	$25\pi/8$
Speed of light c_G1	299,789,233.68 m/s	$2^3\times3^5\times5^6\times\pi^2$
Lattice speed of light	3×10^8 m/s	pure {2,3,5}
Mercury precession	5599.224727986 ″/century	$5^6\times100/9\pi^3$
Light deflection at Sun	1.750830053 ″	$17.28/\pi^2$ (12^3 cube)
Electron rest energy	511280.83701927 eV	$2^9\times3^8\times5^6\times\pi^4\times10^{-7}$
Proton / electron ratio	1836.1181087117	$6\pi^5$
Balmer-β line	486 nm	2×3^5
Rydberg (our register)	10,973,936.899863 m^{-1}	$2^3\times10^9/3^6$
CMB temperature	+2.7254067120 K	$125/4\pi^3$ (K = C×8.64)
Absolute zero	−273.375 K	$-3^7/2^3$
Gamma / consciousness lock	40 Hz	$2^3\times5$ = C_Earth/1000
Body temperature	36.864 °C	$2^9\times3^2/5^3$

Table 3. Intra-dimensional conversions — the operators that walk a single T-value between its faces within one dimension. Any conversion in this paper can be reproduced with them.

From → To	Operator
mass (kg) → wavelength (m)	÷ ($\pi^2/8$)
wavelength (m) → free flow of time (m/s)	÷ 49.50355349930312 (= 7776/50π)
free flow of time (m/s) → frequency (Hz)	× 2π
free flow of time (m/s) → energy (joules)	÷ 24
free flow of time (m/s) → speed of light	(free flow of time)² × 864 × 3600
temperature: Celsius → Kelvin	× 8.64
time ladder (seconds → year)	×60 ×60 ×24 ×(360/2π)
radian veil (hidden lattice)	× 180/π = × 57.29577951308232

A Note on the Numbers

The values in this paper are given as bare numbers — without units, and without powers of ten — because a T-value is one number across all of its registers at once. The same value can present as a wavelength, a time, a mass, or an angle depending on where it is read; it is not solved "to the power of" in a single dimension. When a quantity here carries a unit, that is a convenience for the reader meeting it in a familiar setting, not a claim that the number belongs to that dimension alone.

A Note on Constants

Within the Universal Force of Time there are no universal constants. A quantity like the Rydberg is not one fixed number but a small family of register faces, each an exact {2,3,5,π} value, each reproducing the spectrum on its own scale of T. What conventional physics records as the constant is a single measurement sitting in the band those faces define, read from the one register our instruments occupy: the Earth-surface node. The speed of light, the Planck value, and the fine-structure ratio all behave the same way — each shifts from g_0 to g_1 to g_2 to g_3 by the lattice step, not by error. These are not constants; they are the values T wears at the register where we stand.

This paper is one thread of a single body of work. The full theory — every paper, every derivation — is at universalforceoftime.org

Stephen Daubney · The Daubney Foundation · The Universal Force of Time
thedaubneyfoundation@gmail.com · universalforceoftime.org · 2026 · Rev 3