The T-Cascade

Free fall, the proton, and the speed of light are nodes of one T-cascade — a single exact ladder of {2,3,5,π} values that runs from the Earth's interior to the speed of light and the planet's own turning.

Stephen Daubney · The Daubney Foundation · Rev 8 · 2026

T — the one substance. 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

What science calls the acceleration of free fall (9.817477042468 m/s²) and what science calls the speed of light (299,789,233.683089 m/s) are not different phenomena. They are two nodes of a single T-cascade — one exact, hierarchical ladder on the {2,3,5,π} lattice through which T-flow organises reality. The G1-register surface flow is $g_1 = 25\pi/8$ m/s² (0.0000 ppm). Multiplied by 60 it is the sodium D Fraunhofer anchor (589.0486225 m/s); squared and carried through the seconds of a day, $g_1^2 \times 86{,}400 \times 36 = 30{,}375{,}000\pi^2 = c_1$, an algebraic identity. But the ladder runs both ways. Below the surface it descends through the Earth's Mohorovičić equalization shell to the proton itself — $m_p = 9375/\sqrt{(1000\pi)} = 167.2616359$ — so that the proton is the equalization shell read one rung down. Above the surface it rises through three faces of the speed of light, joined by a square-root map that halves the residual gap at each pass: c_G1 (299,789,233.7) → c_dual (299,802,746.8, the value we measure) → c_G2 (299,816,259.9), the attracting fixed point the whole ladder spirals into and cannot leave. From that ceiling the cascade descends once more to the Earth's own sidereal rotation, 23564.069 s. Mass and energy are not different things; they are adjacent rungs, crossed by squaring upward and square-rooting downward, with $9375 = 3\times5^5$ the mass step. The impossibility of reaching the speed of light is not an externally imposed law — it is that c_G2 is the only unity-gain value in the ladder, and T offers no shortcut through its own hierarchy.

Key results at a glance

- $g_1 = 25\pi/8 = 9.817477042468$ m/s² — the surface T-flow, a lattice node, not a measured constant.
- $g_1 \times 60$ = the sodium D line (589.0486225); $g_1^2 \times 86{,}400 \times 36 = c_1$ (0.0000 ppm).
- The proton is the Moho shell, one rung down — $m_p = 9375/\sqrt{(1000\pi)} = 167.2616359$.
- Three faces of c — c_G1 → c_dual (the measured c) → c_G2, the gap halving ($\delta_G/2 + \delta_G/4 + \ldots = \delta_G$).
- c_G2 is the fixed point — the cascade loops into it; from it, ×2400 → the Earth's sidereal rotation.

1. What you are feeling right now

Stand still for a moment. Feel the floor beneath your feet — weight, pressure, the steady insistence of the ground against your body. It is the most universal experience in human existence. Every person who has ever lived has felt it.

Science calls it the acceleration due to gravity: about 9.81 metres per second, every second, downward — a number engineers use and pilots trust, accepted as a brute constant of nature. The Universal Force of Time gives a precise answer to what it actually is, and a stranger one: the very same thing as the speed of light, a few nodes apart on one ladder. What holds you to the ground and what carries starlight across the universe are the same substance — T — flowing at two rungs of a single cascade. This paper climbs that ladder from end to end.

2. The surface flow is a lattice node

A value sits on the {2,3,5,π} lattice when it can be written exactly as a product of powers of 2, 3, 5 and π. The surface T-flow rate is such a value — and it is one of the simplest on the whole lattice, the two smallest primes joined by a single circle:

$g_1 = 25\pi/8 = 9.817477042468$ m/s²
verify: √(c_1 / (864 × 3600)) = 9.817477042468 (0.0000 ppm)

25π/8 = 5²π/2³. Science arrived at ~9.81 by measurement and called it a constant; UFOT derives it from the lattice and shows it to be a structural node — the place the G1 surface register sits.

3. The operators — the rungs of the ladder

The whole cascade is walked with one fixed, small set of operators. Each is a step between two faces of the one T-value; nothing is converted, only re-read.

step between	operator
mass ↔ radial mass	× / ÷ 9375 (= 3×5⁵)
radial mass ↔ energy	square (up) / √ (down) — the doorway
energy ↔ free fall	× 24 (up) / ÷ 24 (down)
free fall ↔ wavelength	×/÷ 60 (sodium route) or ×/÷ 49.5035535 (hydrogen route)
mass ↔ c	÷ 2 × 10^5
g_2 ↔ sidereal rotation	× 2400 (= 24 × 100, the day)

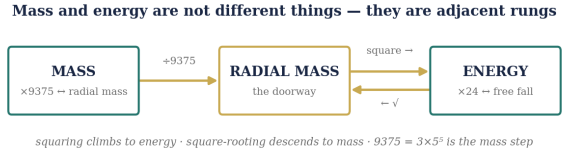

Fig. 1 — The mass↔energy doorway: squaring climbs to energy, square-rooting descends to mass; ×9375 is the mass step.

4. One minute to the sodium line

Multiply the surface flow by 60 — the seconds in a minute, itself pure lattice (60 = 2²×3×5) — and the number that comes out is, to the digit, the sodium D line: the anchor of the Fraunhofer solar spectrum, the most precisely measured reference in the history of astronomy.

$g_1 \times 60 = 589.0486225481$ m/s
NaD (UFOT) = 588.9955242462 nm
the same number — one a speed (mechanics), one a wavelength (optics)

g_1×60 = 375π/2; NaD = 9375×2π/(100·(1+δ_G)), one G-bond step δ_G = 90.15 ppm apart. The sodium atom emits there not because an electron falls between levels, but because that number is the one-minute node of the cascade and the atom is locked to that register.

→ *Want this in full? See the companion paper: The Colour of Time — how a wavelength in nm is a T-register node read in the degree domain..*

5. The proton at the floor

The ladder does not begin at the surface — it runs below it, down to the Earth's interior and then to the proton. The Mohorovičić discontinuity, 6366.197724 km = 20000/π, is the no-distortion radius where the linear and orbital spacetime speeds equalise. Read as an energy it is 2/(1000π); halve it, take the doorway down, and the proton mass is forced.

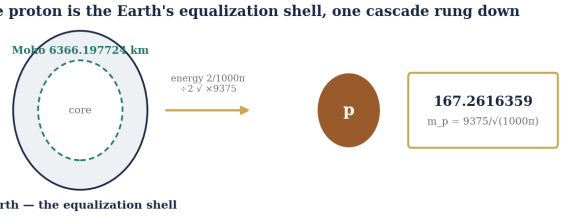

Fig. 2 — The proton is the Earth's equalization shell, one cascade rung down: m_p = 9375/√(1000π).

Moho energy = 2/(1000π) = 0.0006366197724
÷ 2 = 1/(1000π) = 0.0003183098862 (the cascade floor)
√ = 0.01784124116 → × 9375 = 167.2616359 = the proton mass

m_p = 9375/√(1000π) — the one value whose radial-mass-squared is 1/π, so that twice its energy is the Moho equalization. The proton is the Earth's equalization shell read one rung down. The same 167.2616359 is reached independently from the Earth's radius: 6388.923874 × 2π ÷ 4 ÷ 60.

→ *Want this in full? See the companion paper: The Proton — One Flow of Time, Five Clocks (the proton's properties on the lattice)..*

6. The spine — a sodium line up to the speed of light

Now the climb. Begin at the sodium Fraunhofer line and walk the operators up: the line descends to the surface free fall, through the doorway, and out the

other side as the first speed of light.

NaD = 588.9955242 nm → ÷60 = 9.81659207 (free fall)
→ ÷24 = 0.4090246696 (energy) → √ = 0.6395503652 (radial mass)
→ ×9375 = 5995.784673 (mass, = 2·c_G1/10⁵)
→ ÷2 ×10⁵ = 299,789,233.7 = c_G1 (= 2³·3⁵·5⁶·π²)

The same mass taken the hydrogen way (÷ π²/8 → 486.0 nm Hβ → ÷49.5035535) returns $g_1 = 25\pi/8$ exactly, and starts the next pass up.

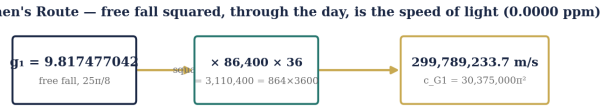

Fig. 3 — Stephen's Route: free fall squared, carried through the seconds of a day and the lattice integer 36, is the speed of light.

The simplest statement of the ceiling needs only numbers any civilisation would know on the first day it counted time — the seconds in a day and the lattice integer 36:

$c_1 = g_1^2 \times 86{,}400 \times 36 = 9.817477042468^2 \times 3{,}110{,}400$
= 299,789,233.683089 m/s (= 30,375,000π², 0.0000 ppm)

The bridge 86,400 × 36 = 3,110,400 = 864 × 3,600: the T-day 864 = $2^5 \cdot 3^3$, the hour 3,600, and the compressed circle 36. Using the full 360 gives exactly 10 × c_1. The speed of light is written into the length of a day and the degrees in a circle.

> *→ Want this in full? See the companion paper: What Science Calls Gravity — the identity $g_1^2 \times 864 \times 3600 = c\_G1$, the bridge between the register you inhabit and the register you see..*

7. Three faces of the speed of light

The climb does not stop at c_G1. Each pass up the ladder is the square-root map c_out = k·√(c_in), and a square-root map has slope exactly ½ at its fixed point — so every pass halves the remaining gap. Three faces emerge, and they are not rival measurements; they are rungs flowing into one terminus.

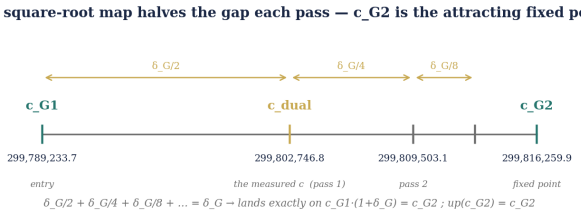

Fig. 4 — The square-root map halves the gap each pass; the steps δ_G/2 + δ_G/4 + … sum to δ_G, landing exactly on c_G2, the fixed point.

The first pass lands c_dual = (c_G1 + c_G2)/2 = 299,802,746.8 — and this is the value we actually measure. The steps δ_G/2 + δ_G/4 + δ_G/8 + … form a geometric series summing exactly to δ_G, landing on c_G1·(1+δ_G) = c_G2 = 299,816,259.9. The decisive check: up(c_G2) = c_G2 to 0.00005 ppm. c_G2 is the attracting fixed point; c_G1 and the dual are transient rungs flowing into it. The cascade cannot hand off to another dimension because the map has nowhere else to send it — it loops and stays.

8. The ceiling descends to the Earth's turning

From the fixed point the cascade comes back down once more, and what it lands on is the planet's own rotation — the day you are living inside.

c_G2 ÷ 10⁵ × 2 = 5996.325197 (mass) → ÷9375 → square
→ energy 0.4090984206 → ×24 = 9.818362094 = g_2 (= 25π/8 ·(1+δ_G))
→ ×2400 = 23564.069025 = the Earth's sidereal rotation (23:56:04.069)

$g_2 = 7500\pi(1+\delta\_G)$ seeds the sidereal day; g_2 is the free fall that tops a sub-24h turn up to a whole 24. The ceiling of the cascade is the Earth's own turning, and g_2 sits one rung below it.

9. Why the speed of light is unreachable

Science says nothing can reach the speed of light and offers no deeper reason than that the equations forbid it — the Lorentz factor grows without bound. The mathematics is clear; the reason is not. The cascade gives the reason. The net effect of one pass on any value is a gain of k/√c. Below g_2 the gain exceeds one and the value is pushed up; above it the gain is less than one and the value is pushed down; at c_G2 the gain is exactly one and the cascade becomes the identity — it does nothing and lets the value rest.

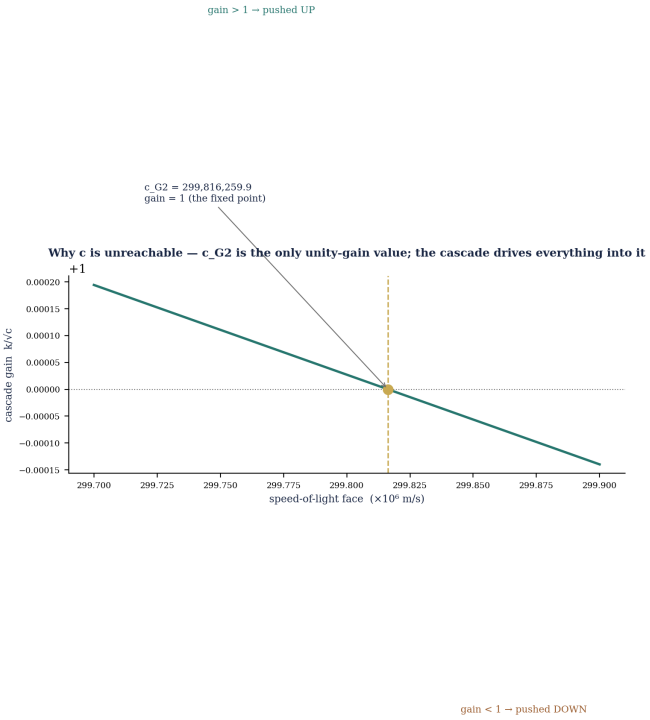

Fig. 5 — c_G2 is the only unity-gain value; everything is driven toward it, nothing past it.

c is not a wall — it is a floor you do not live on. You exist at g_1, the one-second register; your mass, your chemistry, your nervous system are tuned to that level of T-flow. To reach c you would have to traverse the whole ladder, and you cannot skip registers any more than you can leap from the ground floor of a building to the tenth by running faster. The floors are discrete; c is simply the rate at which T flows on a floor you were not built for. In the language of the conservation law, c_G2 is the $d\Sigma T=0$ equilibrium — time balanced, nothing left to redistribute. The cascade is T flowing to its own rest.

10. One cascade, end to end

Gather the rungs and the picture is single. The proton, the Earth's Mohorovičić shell, the surface free fall, the sodium Fraunhofer line, the three faces of the speed of light, the Earth's sidereal rotation — and, through the Venus/Earth-radius loop, Venus's own year — are not separate facts of physics. They are one T-cascade, stepped by 9375 and δ_G/2, with squaring and square-rooting as the doorway between mass and energy, and c_G2 as the still point it all spirals into. What we feel as weight is the bottom of the ladder; what we call the speed of light is its ceiling; and the whole of it is one substance, flowing. The complete ladder and every rung follow in the Appendix.

→ Want this in full? See the companion paper: The Master Compendium — the full Universal Force of Time..

References

[1] S. Daubney, The Universal Force of Time — Master Compendium, The Daubney Foundation (2026).
[2] CODATA Recommended Values of the Fundamental Physical Constants (the conventional compass, not the standard).
[3] S. Daubney, What Science Calls Gravity — $g_1^2 \times 864 \times 3600 = c\_G1$, UFOT (2026).
[4] S. Daubney, The Colour of Time — the wavelength as a degree-domain register node, UFOT (2026).
[5] S. Daubney, The Proton — One Flow of Time, Five Clocks, UFOT (2026).
[6] J. Fraunhofer, solar absorption lines (1814); standard NaD reference wavelengths.

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 Universal Force of Time a quantity is not the property of one dimension: the same T-value shows up as a free fall on the ground, a wavelength in a sodium atom, a mass in a proton, a speed in the heavens — one number wearing different coats. That is the whole claim of the cascade: free fall, the sodium line, the proton and the speed of light are the same lattice number read at different rungs. 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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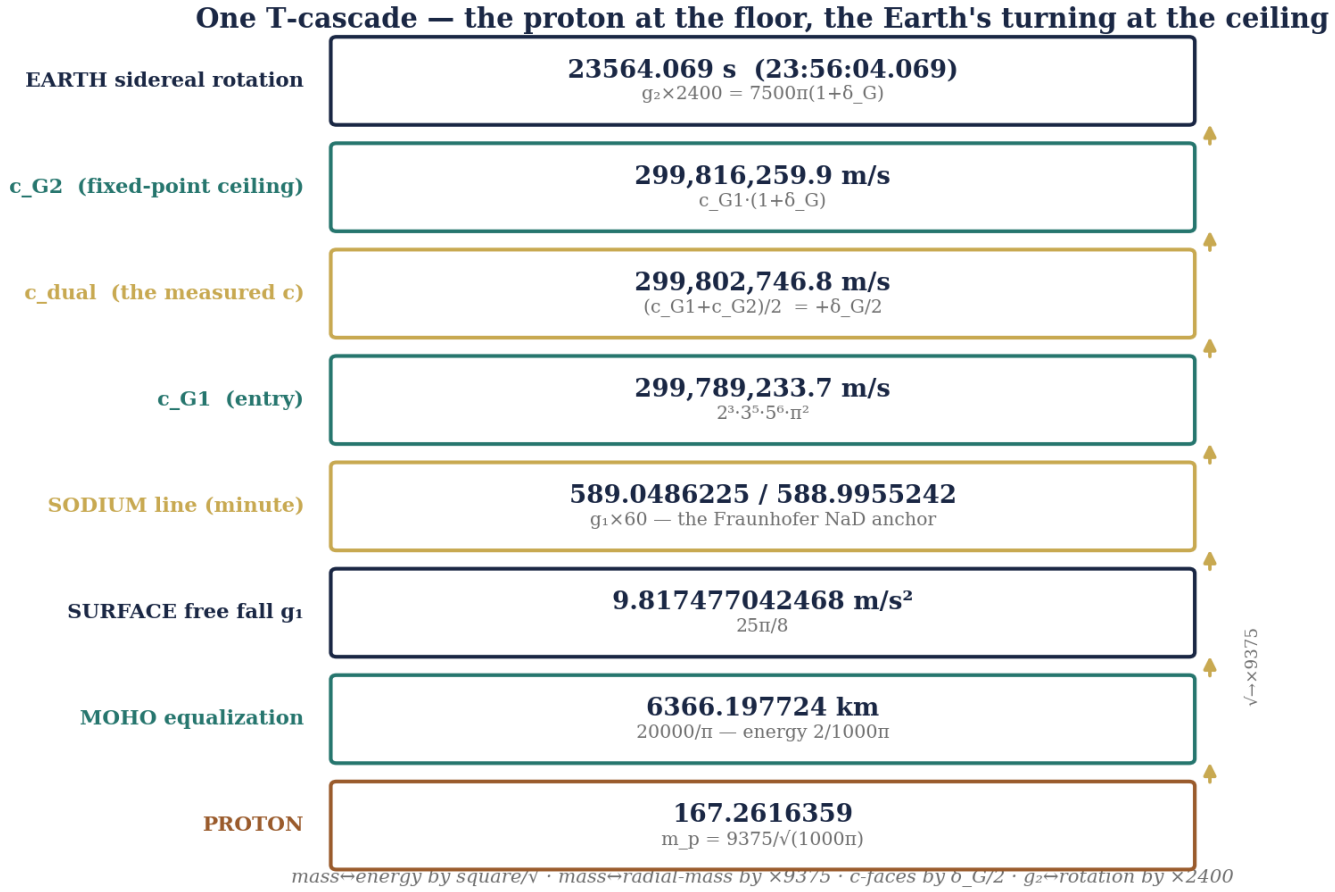
Appendix — The Complete Ladder

Every rung at full precision; the physical value leads, the {2,3,5,π} form follows.



The T-cascade, end to end — the proton at the floor, the Earth's sidereal rotation at the ceiling.

A1. The cascade nodes, floor to ceiling

node	value	lattice form / meaning
proton	167.2616359	9375/√(1000π) — the equalization shell, one rung down
Moho equalization	6366.197724 km	20000/π — energy 2/(1000π)
surface flow of time g_1	9.817477042468 m/s²	25π/8
sodium line (minute)	589.0486225481 m/s	375π/2 ; NaD 588.9955242 nm, one δ_G apart
solar register (hour)	35342.917352885 m/s	11250π = 2×3²×5⁴ × π
biological register (day)	848230.0164692 m/s	270000π — 270 = gestation days × 10³
c_G1 (entry)	299,789,233.683089 m/s	2³·3⁵·5⁶·π²
c_dual (the measured c)	299,802,746.8 m/s	(c_G1+c_G2)/2 = c_G1(1+δ_G/2)
c_G2 (fixed point)	299,816,259.9 m/s	c_G1·(1+δ_G)
Earth sidereal rotation	23564.069025 s	g₂×2400 = 7500π(1+δ_G)

A2. The three faces of c — the square-root map halving to the fixed point

pass	value	gap from c_G2
start (c_G1)	299,789,233.7	−90.151 ppm
1 (c_dual — measured c)	299,802,746.8	−45.075 ppm (+δ_G/2)
2	299,809,503.1	−22.536 ppm (+δ_G/4)
3	299,812,881.5	−11.268 ppm (+δ_G/8)
∞ (c_G2)	299,816,259.9	0 (fixed point; up(c_G2)=c_G2)

$\delta_G = 5^{10}/(2^4\cdot 3^9\cdot \pi^3) - 1 = 90.15060336$ ppm. The series $\delta_G/2 + \delta_G/4 + \delta_G/8 + \ldots = \delta_G$ sums exactly onto $c_{G1}\cdot(1+\delta_G) = c_{G2}$.

A3. The operators (the rungs)

step between	operator
mass ↔ radial mass	× / ÷ 9375 (= 3×5^5)
radial mass ↔ energy	square (up) / √ (down)
energy ↔ flow of time	× 24 / ÷ 24
flow of time ↔ wavelength	× 60 (NaD) or × 49.5035535 (Hβ)
mass ↔ c	÷ 2 × 10^5
g_2 ↔ sidereal rotation	× 2400

A4. Propositions (all verified June 2026)

#	statement
P-CASCADE-1	$g_1 = 25\pi/8 = 9.817477042468$ m/s² — exact at 0.0000 ppm via $\sqrt{(c_1/(864\times3600))}$.
P-CASCADE-2	$g_1 \times 60 = 375\pi/2 = 589.0486225481$ m/s = NaD, one δ_G (90.15 ppm) from 588.9955242 nm.
P-CASCADE-3	$g_1 \times 3600 = 11250\pi = 35342.917352885$ m/s ($11250 = 2\times3^2\times5^4$).
P-CASCADE-4	$g_1 \times 86400 = 270000\pi = 848230.0164692$ m/s (270000 = gestation 270 d × 10^3).
P-CASCADE-5	$c_1 = g_1^2 \times 86400 \times 36 = 2^3\cdot3^5\cdot5^6\cdot\pi^2 = 299{,}792{,}233.683089$ m/s. Algebraic identity.
P-CASCADE-6	$g_1^2 \times 86400 \times 360 = 10 \times c_1 = 2{,}997{,}892{,}336.830893$ m/s.
P-CASCADE-7	$m_p = 9375/\sqrt{(1000\pi)} = 167.2616359$ — the proton as the Moho equalization shell, one rung down.
P-CASCADE-8	c_G2 = c_G1(1+δ_G) is the attracting fixed point: up(c_G2) = c_G2; gain k/√c = 1 only at c_G2.

Every value in this paper is one T-value read in different units. To move a quantity from one face to another — mass, wavelength, flow of time, frequency, energy, joules, circumference, the dimensional spin-orbit value (c) — apply the fixed gear below; any conversion in the paper can then be reproduced by hand.

A5. The Conversion Loop — the gears between the faces

from face → to face	apply (number-first)	lattice
energy (eV) → energy (kJ)	÷ 10368	$2^7\cdot3^4$
energy (kJ) → wavelength λ	÷ 36	$2^2\cdot3^2$
wavelength λ → flow of time g	÷ 49.50355350	3888/25π
flow of time g → frequency f	× 6.283185307	2π
flow of time g → energy (joules)	÷ 24	$2^3\cdot3$
wavelength λ → mass (λ-door)	× 1.233700550	$\pi^2/8$
energy (eV) → circumference C	÷ 31104	$2^7\cdot3^5$
circumference C → mass (circ-door)	÷ 22.00157933	1728/25π
flow of time g → dimensional spin-orbit value c	$c = g^2 \times 3{,}110{,}400$	864·3600

Key. Flow of time (metres per second) = what science calls gravitational free fall. Dimensional spin-orbit value = what science calls the speed of light.

Direct laws: mass↔energy $E = 6.822485557\cdot m$ ($m = 1.465741469\cdot E$); mass↔wavelength $\lambda = 0.810569469\cdot m = 8m/\pi^2$ ($m = 1.233700550\cdot\lambda = \pi^2\lambda/8$); $eV = 373248\cdot\lambda$ ($2^9\cdot3^6$); mass→frequency $f = 0.102880658\cdot m$ (25/243).