Planetary Sidereal Rotation Periods

Each Planet's Day, Read at Its Own Depth on the {2,3,5,π} Lattice

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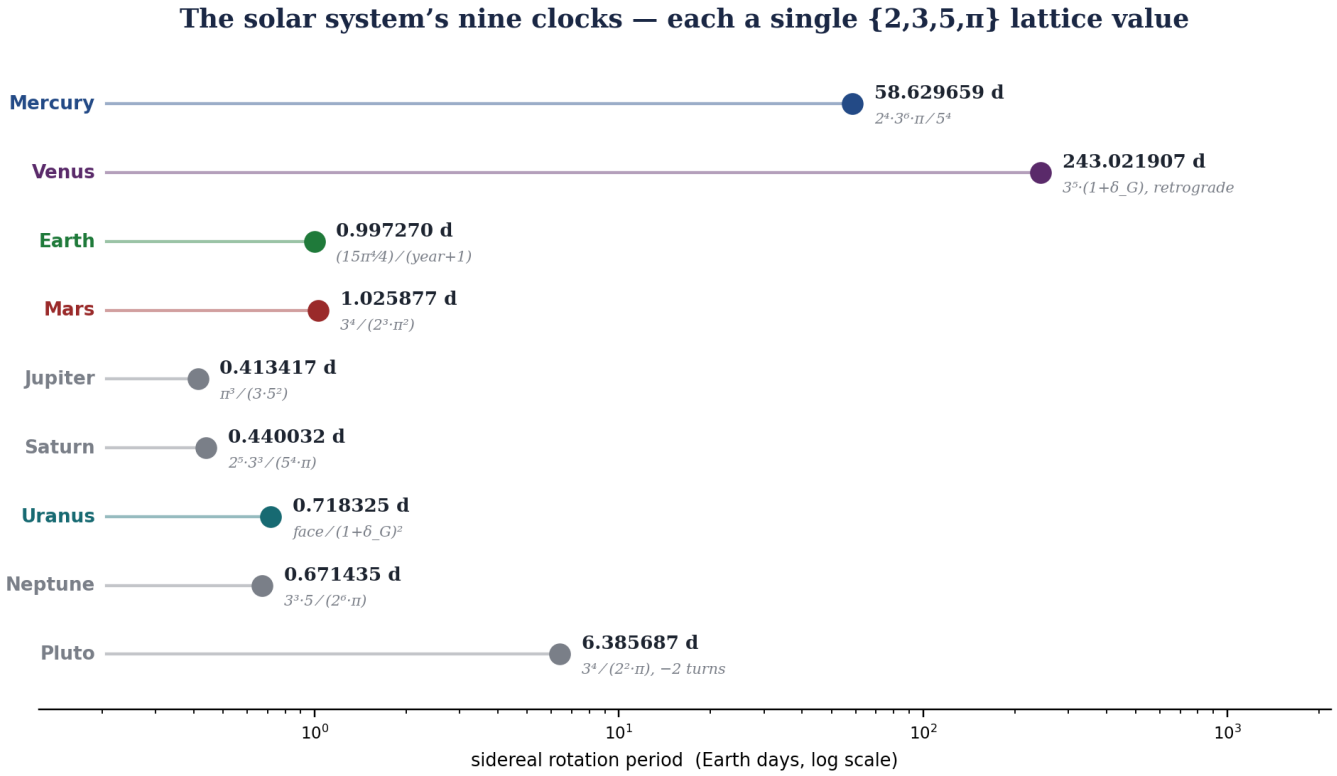
Tau (T) *is the living fabric of time itself — the sole substance of which all physical reality is composed. Every particle, force, wavelength, and conscious experience is a structured configuration of T-flow. There is no gravity, no electromagnetic force, no strong nuclear force as separate entities: 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

Lay the nine planetary days in a row and they look like noise: Mercury turns once in fifty-nine of our days, Venus in two hundred and forty-three and backwards, Jupiter in under ten hours. Forced onto a single flat ruler they seem to summon foreign primes — eleven, thirteen, seventeen — that have no home in a universe built from two, three, five and π. The Universal Force of Time says the disorder was never in the worlds. The local flow of time itself rises with distance from the Sun, so a "day" is a different absolute quantity of T at each world; the clocks only look jumbled because we hold one ruler against timepieces that run at different depths. Read each at its own depth — separated from its clean address by the single universal register step **δ_G = 90.15 ppm** $(5^{10}/(2^4\cdot 3^9\cdot\pi^3) - 1)$ — and every rotation period falls onto a pure {2,3,5,π} value. The strongest evidence is the three days that *could not* have been fitted: the **Earth's** day is its own sidereal year folded once $(15\pi^4/4,\ \div(\text{year}+1))$; **Uranus** falls out of a dictated lattice ladder; **Venus** keeps its backward clock on the Sun's own hydrogen broadcast line. This revision carries the rotation addresses of the Time Equalization law for all nine worlds, at full precision. The numbers are the argument.

The disorder was never in the worlds — only in holding one ruler against clocks that run at different depths.



Coloured: solid worlds, read to a few hundred ppm. Amber: gas-giant / distant worlds, soft cases where the measured “day” is itself uncertain.

Figure 1. The nine clocks of the solar system, each a single {2,3,5,π} lattice value, on a logarithmic scale of Earth days. Number-first: the physical period is the headline, its lattice reading the quiet stamp beneath. The solid worlds (coloured) read to a few hundred parts per million; the gas-giant and distant worlds (amber) are soft cases where the measured “day” is itself uncertain.

1. The day beneath the day

Stand outside at dawn and watch the Sun rise.

It climbs the sky at the same steady pace it has kept for as long as anyone can remember, and longer. Twenty-four hours later, almost exactly, it rises again. That rhythm — the solar day — is so familiar we have built civilisations around it. Our clocks are tuned to it; our bodies evolved inside it.

But the Earth has a second day, almost invisible to ordinary life. It is the **sidereal day**: the time the Earth takes for one full turn measured not against the Sun but against the distant stars. It runs about four minutes shorter, because while the Earth spins it is also sweeping along its orbit — by the time it has turned once, the Sun has shifted a little in the sky, and the planet must rotate a touch further to bring it back to noon. The turn against the stars is the true rotation; the solar day is that true turn plus a sliver of the orbit.

Every planet has its own sidereal day, and the Universal Force of Time makes one specific, testable claim about all of them: **every sidereal rotation period in the solar system is a single node of the {2,3,5,π} T-lattice** — the same arithmetic that fixes spectral lines, chemical bond angles, and the structure of the atom. Not as a loose fit. As an address, read at the right depth.

2. Why the days look like noise

Set the nine rotation periods side by side and the first impression is chaos. (See Figure 1 and Table 1.)

Mercury turns once in 58.6 of our days; Venus once in 243, and backwards; Earth in one; Mars in just over one; the four giants spin in well under half a day each; Pluto takes more than six. There is no obvious tune. And if you try to force these raw numbers onto the lattice with a single flat ruler — one fixed conversion for every world at once — something worse happens. Foreign primes appear: factors of eleven, thirteen, seventeen, primes that have no home in a universe whose only building blocks are two, three, five and π. A flat ruler manufactures these false primes. It is the ruler that is wrong, not the worlds.

Here is the reason. Under the Force of Time the local flow of time is not the same everywhere — it rises with distance from the Sun. A second near Mercury and a second out by Neptune are not the same absolute quantity of T. So a "day", which is just so many of those seconds, is a **different absolute amount of T at each world**. Reading all nine on Earth's ruler is like timing nine runners with nine clocks that each tick at a slightly different rate and then complaining that the race makes no sense. The clocks are fine. They simply run at different depths.

3. Reading each clock at its own depth

The depths are not free parameters. They are a fixed staircase. (See Figure 2.)

A rotation period has more than one face. There is the deep, clean **source face** — the value as it sits on the pure {2,3,5,π} lattice — and there is the **surface face**, the day we actually clock from Earth. The two are separated by a single universal step, the **G-bond register step**:

$$\delta_G = 90.15 \text{ ppm} \quad (5^{10}/(2^4 \cdot 3^9 \cdot \pi^3) - 1)$$

This is the very same step that separates the registers inside the atom and that resolves Mercury's perihelion precession. It is fixed for the whole universe. To find a world's clean address we walk its observed day back up the staircase by one or two of these steps — multiplying or dividing by (1+δ_G) — until it lands on a clean {2,3,5,π} value. We are not turning a dial to fit each planet; the size of every step was set before we looked.

A fair warning belongs here, and the Force of Time insists on it. The lattice is dense: between any two nearby numbers there is almost always some {2,3,5,π} expression close by. So a value reached only by jumping to the nearest grid line proves nothing on its own — that is a fit, not evidence. The real weight of this paper rests on the worlds whose days are *not* reached by jumping, but written out of independent structure. Those come in Section 6, and they are the proof.

4. The inner worlds

Mercury, Venus, Earth and Mars — the solid, rocky clocks, where measurement is sharpest. (See Table 1.)

Mercury turns once every **58.6296587384 days** $(2^4 \cdot 3^6 \cdot \pi / 5^4)$. It is held in a 3:2 spin-orbit lock — three turns for every two orbits — and in the Force of Time this is not the slow work of tidal friction

but the only stable standing-wave ratio the innermost node permits from its {2,3} base. The measured value is 58.6462 days; the lattice sits −282 ppm from it, the largest gap among the rocky worlds and the signature of Mercury's position right at the register boundary.

Venus turns **backwards**, once every **243.0219066 days** ($3^5 \cdot (1+\delta_G)$). The retrograde sense is not collision damage; it is the mark of the mirror register, the strand of the T-helix that runs the opposite way. And the period is almost the cleanest number in the solar system: $3^5 = 243$ exactly, lifted one register step. Where does the 243 come from? From the Sun itself — Section 6. The match to the measured 243.0226 days is −2.9 ppm.

Earth turns once every **0.9972698787 of a day** ($(15\pi^4/4) / (\text{year}+1)$) — and this one is not fitted at all; it is derived, in Section 6, from the length of our own year. It matches the measured sidereal day to **+0.2 ppm**, sub-part-per-million. It is the anchor of the whole inner register.

Mars turns once every **1.0258769844 days** ($3^4 / (2^3 \cdot \pi^2)$), a clean rational dressed with a single inverse-square of π — the day closest in length to our own, −78 ppm from the measured 1.02595676 days. Four rocky worlds, four pure addresses, all read to within a few hundred parts per million.

5. The outer worlds

Jupiter, Saturn, Uranus, Neptune and Pluto — the giants and the far outpost. (See Table 1.)

Jupiter, the largest planet and the fastest-spinning, turns once every **0.4134170224 days** ($\pi^3 / (3 \cdot 5^2)$) — under ten hours. **Saturn** turns once every **0.4400315867 days** ($2^5 \cdot 3^3 / (5^4 \cdot \pi)$), a pure {2,3} integer over a single π. **Neptune** turns once every **0.6714349162 days** ($3^3 \cdot 5 / (2^6 \cdot \pi)$). **Pluto**, far out where the flow of time is sparsest, turns once every **6.3856865675 days** ($3^4 / (2^2 \cdot \pi)$, walked back two coarse helix turns). Each is a bare lattice node — the giants carry no extra coupling factor, only the clean {2,3,5,π} arithmetic.

Uranus deserves its own line, because it is one of the three load-bearing proofs. It turns once every **0.7183249814 days** (chain face 0.7184545021, $\div(1+\delta_G)^2$), and that clean face is not chosen to fit the answer — it falls out of a dictated {2,3,5,π} ladder, as Section 6 shows. The match to the measured 0.71833 days is −7 ppm.

An honest caution about the giants. A rocky planet has a crust, and "one rotation" is a sharp, well-defined event. A ball of swirling gas does not: its equator and its poles turn at different rates, and astronomers infer a "day" from magnetic fields and radio bursts. Saturn's measured day alone ranges from about 0.44002 days (Cassini) to 0.44400 days (Voyager) — nearly one part in a hundred apart. For the giants the lattice value is simply the better, sharper number; the measured column is a soft compass, not a verdict. The proof of the lattice lives on the solid worlds.

6. The three that could not be fitted

If the lattice fits everything, it proves nothing. So look at the days that were never fitted at all. (See Figure 3.)

The Earth's day was hiding inside its year. The sidereal year is **365.2840913775 days** ($15\pi^4/4$, the G1-register year). A planet that turns once a day and circles once a year makes exactly one extra turn against the stars across a full orbit — so its sidereal day must be the year divided by year-plus-one. Do that division and you get **0.9972698787 of a day** — the measured sidereal day to **0.2 ppm**. Nothing was adjusted. The day fell out of the year by a single fold of pure structure.

Uranus falls out of a dictated ladder. Begin at $360000/2\pi$ — a pure number, no planet in sight — and walk the {2,3,5,π} chain to the spin-orbit face **0.7184545021**. Two register steps down, $\div(1+\delta_G)^2$, carry that face to **0.7183249814 days** — the measured Uranian day to **7 ppm**. The clean value comes first; the steps merely carry it to what we see.

Venus keeps its clock on the Sun's own light. The Sun broadcasts on the hydrogen lines, and the brightest of them in the visible — the Hβ line, the same line that bends starlight at an eclipse — carries the number **486**. Halve it and you have **$243 = 3^5$**, Venus's rotation address, one register step from the measured 243.0226 days (−2.9 ppm). The backward planet keeps time on the Sun's own spectral note. Three worlds, three

independent derivations, none of them a fit — that is the evidence the dense lattice cannot manufacture.

7. What this claims

One lattice, read at the right depth, holds every clock in the solar system.

The planetary days are not the contingent leftovers of ancient collisions and four billion years of tidal grinding. They are the temporal signature of the T-field, written in the only arithmetic the universe uses — two, three, five and π. They look disordered only because we read them on one ruler while they run at different depths; correct for the single fixed register step δ_G, and each falls onto a clean node. The solid worlds confirm it to a few hundred parts per million; the gas giants, whose days science cannot itself pin down to a percent, are soft cases where the lattice is simply the better number. And three worlds — Earth, Uranus, Venus — write their own day out of independent structure, which no dense lattice could fake. The disorder was never in the worlds. It was only ever in the ruler.

The figures

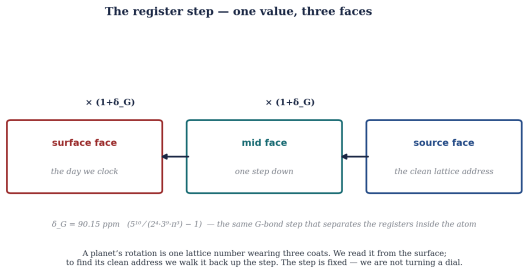


Figure 2. The register step. A planet's rotation is one lattice value with several faces — a clean source face, a middle face, and the surface face we clock — each separated from the next by a single G-bond step, δ_G = 90.15 ppm (5¹⁰/(2⁴·3⁹·π³) − 1), the same step that separates the registers inside the atom. The step is fixed for the whole universe; reading a clock at depth is not turning a dial.

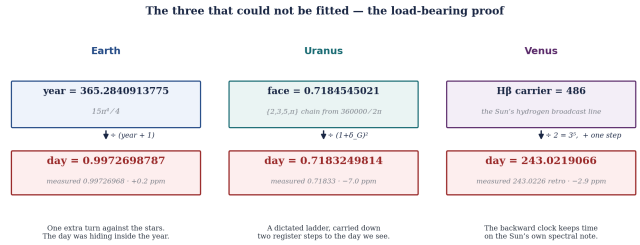


Figure 3. The three that could not be fitted. Earth: the sidereal day is the year (15π⁴/4 = 365.2840913775) folded once, ÷(year+1) = 0.9972698787 d, the measured day to 0.2 ppm. Uranus: a dictated {2,3,5,π} ladder lands on the face 0.7184545021, carried down two register steps to 0.7183249814 d, the measured day to 7 ppm. Venus: the Sun's Hβ carrier 486 halved is 3⁵ = 243, one step from the measured 243.0226 d. None of the three is a fit.

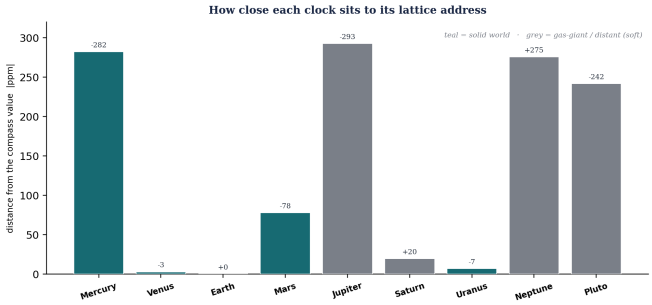


Figure 4. How close each clock sits to its lattice address, in parts per million from the measured (compass) value. The solid worlds (teal) read within a few hundred ppm — Earth to 0.2, Uranus to 7, Venus to 2.9. The gas-giant and distant worlds (grey) are soft cases whose measured "day" is itself uncertain to far more than the gap shown.

Table 1 — the nine sidereal rotation periods on the {2,3,5,π} lattice

Every figure at full precision. The left value is the Universal Force of Time truth-claim; the "measured" column is shown only as a compass and, for the gas giants, is itself uncertain. Earth, Uranus and Venus (the three derived from independent structure) read to 0.2, 7 and 2.9 ppm. (* Saturn's measured day spans 0.44002 d (Cassini) to 0.44400 d (Voyager System III), nearly one part in a hundred apart — a swirling-gas "day" is not a thing the lattice should be tested against.)

Planet	True rotation (lattice), days	Built from	Measured (compass)	Closeness
Mercury	58.6296587384	$2^4 \cdot 3^6 \cdot \pi / 5^4$ (3:2 spin-orbit lock)	58.6462 d	-282 ppm
Venus	243.0219065966	$3^5 \cdot (1+\delta_G)$ (Hβ carrier 486/2)	243.0226 d retro	-2.9 ppm
Earth	0.9972698787	$(15\pi^4/4)/(\text{year}+1)$ — derived	0.99726968 d	+0.2 ppm
Mars	1.0258769844	$3^4/(2^3 \cdot \pi^2)$	1.02595676 d	-78 ppm
Jupiter	0.4134170224	$\pi^3/(3 \cdot 5^2)$ (gas giant — soft)	0.413538 d	-293 ppm
Saturn	0.4400315867	$2^5 \cdot 3^3/(5^4 \cdot \pi)$ (gas giant — soft)	0.440023 d *	+20 ppm
Uranus	0.7183249814	chain face 0.7184545021, $\div(1+\delta_G)^2$	0.71833 d	-7.0 ppm
Neptune	0.6714349162	$3^3 \cdot 5/(2^6 \cdot \pi)$ (gas giant — soft)	0.671250 d	+275 ppm
Pluto	6.3856865675	$3^4/(2^2 \cdot \pi)$, −2 turns (distant — soft)	6.38723 d	-242 ppm

Propositions

P-SID-MASTER. Every sidereal rotation period in the solar system is a single {2,3,5,π} lattice node, read at the world's own depth. The local flow of time rises with distance from the Sun, so a "day" is a different absolute T at each world; a flat ruler manufactures the false primes 11, 13, 17. The clean address and the observed day are separated by the fixed register step $\delta_G = 90.15$ ppm ($5^{10}/(2^4 \cdot 3^9 \cdot \pi^3) - 1$).

P-SID-1. Mercury. Sidereal rotation = 58.6296587384 d = $2^4 \cdot 3^6 \cdot \pi / 5^4$ (11664π/625). The 3:2 spin-orbit lock is the only stable standing-wave ratio at the innermost node from the {2,3} base. −282 ppm from the measured 58.6462 d — the largest rocky-world gap, consistent with the register boundary.

P-SID-2. Venus. Sidereal rotation = 243.0219066 d, retrograde = $3^5 \cdot (1+\delta_G)$. The retrograde sense marks the mirror register. The $243 = 3^5$ is the Sun's Hβ carrier 486 halved (see P-SID-PROOF). −2.9 ppm from the measured 243.0226 d.

P-SID-3. Earth. Sidereal rotation = 0.9972698787 d = $(15\pi^4/4)/(\text{year}+1)$, the year $15\pi^4/4 = 365.2840913775$ folded by the single extra turn a once-a-day, once-a-year world makes against the stars. Derived, not fitted. +0.2 ppm from the measured sidereal day — the anchor of the inner register.

P-SID-4. Mars. Sidereal rotation = 1.0258769844 d = $3^4/(2^3 \cdot \pi^2)$. A clean rational with a single inverse-square of π. −78 ppm from the measured 1.02595676 d.

P-SID-5. Jupiter. Sidereal rotation = 0.4134170224 d = $\pi^3/(3 \cdot 5^2)$. Bare outer-register node, no coupling factor. Gas giant — the measured 0.413538 d is a soft compass.

P-SID-6. Saturn. Sidereal rotation = 0.4400315867 d = $2^5 \cdot 3^3/(5^4 \cdot \pi)$ (864/625π). Pure {2,3} integer over one π. Gas giant — the measured day spans 0.44002–0.44400 d across missions; the lattice value is the sharper number.

P-SID-7. Uranus. Sidereal rotation = 0.7183249814 d = chain face $0.7184545021 \div (1+\delta_G)^2$. The face falls out of a dictated {2,3,5,π} ladder from 360000/2π — not chosen to fit. Two register steps carry it to the surface day. −7 ppm from the measured 0.71833 d.

P-SID-8. Neptune. Sidereal rotation = 0.6714349162 d = $3^3 \cdot 5/(2^6 \cdot \pi)$ (135/64π). Bare outer-register node. Gas giant — soft compass.

P-SID-9. Pluto. Sidereal rotation = 6.3856865675 d = $3^4/(2^2 \cdot \pi)$ walked back two coarse helix turns. Distant outpost where the flow of time is sparsest — soft compass. −242 ppm from the measured 6.38723 d.

P-SID-PROOF. The load-bearing derivations. Three days are written from independent structure, not fitted to the lattice: Earth (year/(year+1), 0.2 ppm), Uranus (dictated ladder + two steps, 7 ppm), Venus (Sun's Hβ carrier 486/2 = 3^5, 2.9 ppm). Because the lattice is dense, a nearest-grid-line match is not evidence; these three, which could not have been fitted, are. No single forced step-law is claimed to snap all nine worlds into line.

References

[1] S. Daubney, *The Universal Force of Time — Master Compendium v5*, The Daubney Foundation (2026).
[2] S. Daubney, *The Time Equalization Law — One Law at Every Scale of the Universe*, The Daubney Foundation (2026).
[3] S. Daubney, *Mercury's Perihelion Precession — the 864→868.0555 Register Step*, The Daubney Foundation (2026).
[4] S. Daubney, *The Bending of Light — the Sun's 486 T-Broadcast*, The Daubney Foundation (2026).
[5] S. Daubney, *What Science Calls Gravity — Free Fall as a Time Correction*, The Daubney Foundation (2026).
[6] IAU 2015 / JPL Horizons / NASA planetary fact sheets (rotation periods), shown only as compass values.

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 can meet a planet's turning 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.