

THE UNIVERSAL FORCE OF TIME

The Flip

The twenty-one centimetre line, Mercury's two orbits, and one source: the proton

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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 $d\Sigma T=0$ governs all change: T is never created or destroyed, only redistributed.

Abstract

Science describes the twenty-one centimetre line of hydrogen as a flip: the electron's spin turns over against the proton's, and a photon of radio light leaves. It is tempting to read that flip as something that happens once per orbit, and then to ask why no planet is seen to flip after each orbit. This paper answers both halves. The line is the hyperfine transition of hydrogen's ground state, the 1s state with nothing below it — there is no orbit in it at all, and a single atom makes the transition about once in eleven million years. In the Universal Force of Time the line has an exact address, and that address sits on the G1 face of Mercury's orbit: the orbit's G1 period, 87.9444881075312360002278538142 days, times 24 is the line's wavelength, 21.1066771458074966400546849154 cm, times 100, exactly. Mercury's orbit has two faces of opposite parity. The G2 face is a room — a state, the thing we watch going round — and the G1 face is a road, a transport between states; the line sits on the road, not on the room we watch. And Mercury is the one planet that does flip after every orbit: its three rotations in two orbits turn it half a turn against the Sun each orbit, so that the face that faced the Sun faces away, and only after two orbits is it restored. The source of it all can be named. The proton, as it stands, gives hydrogen's blue line; opened out, it gives the same line on the G2 register, where hydrogen's ionisation energy lands too; three-quarters of that, carried by $\pi^4/25$, is the twenty-one centimetre line's frequency, $5^8 \cdot \pi/864$ MHz; and the ionisation energy times the charge is turn two of the DNA helix. One source, five domains.

1 · What the Twenty-One Centimetre Line Is

Point a radio telescope almost anywhere along the plane of the Galaxy and it picks up a faint, steady signal at a wavelength of about twenty-one centimetres. It is the most important line in radio astronomy: it maps the cold hydrogen gas of the whole Milky Way. And science describes it as a flip.

The flip is not an orbit. The line comes from hydrogen's ground state, $n = 1$, the 1s state — the state with nothing below it. There is no orbit in it at all. What has two states is the relative alignment of two spins, the proton's and the electron's:

F = 1	the two spins parallel	the upper state
F = 0	the two spins antiparallel	the ground

The photon leaves when the pair goes from parallel to antiparallel. It is the alignment that changes, not the electron's place. And it is not frequent. Measured, the spontaneous rate is 2.876×10^{-15} per second — a mean lifetime of about eleven million years for one atom. The line is seen at all only because the Galaxy holds so much hydrogen that, somewhere in the beam, some atom is always making the transition. It is not a cycle. It is the rarest thing hydrogen does, and in the language of this framework it is a road, not a room: a transport between states, not a state that goes round.

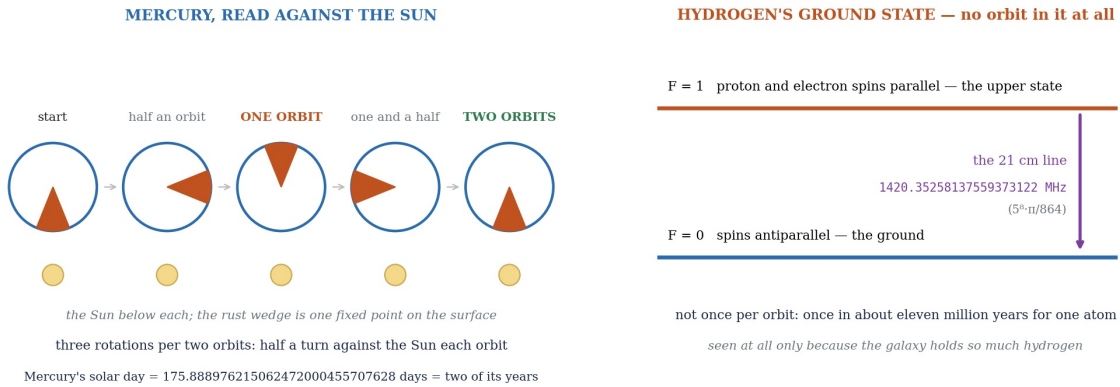
Figure 1 — Two two-state systems, and only one of them turns

Figure 1 — Two two-state systems, and only one of them turns. Left: one fixed point on Mercury's surface, read against the Sun, over two orbits. Right: hydrogen's ground state, with no orbit anywhere in it and about eleven million years between flips.

2 · The Face We Watch Is Not the Face the Line Is On

A natural objection follows: if the line were a flip once per orbit, some planet should be seen to flip after each orbit, and none is. The framework's own grammar gives that objection a precise form, and answers it.

Every value in the Universal Force of Time has an address, $2^a \cdot 3^b \cdot 5^c \cdot \pi^d$, and the power of π — the π -degree — decides its kind. An even degree is a room: a state, a thing that simply is, or simply goes round. An odd degree is a road: a transport between states.

object	value	address	π -degree	kind
the 21 cm line	21.1066771458074966400546849154 cm	$2^4 \cdot 3^8 \cdot \pi / 5^6$	+1	road
Mercury's orbit, G1 face	87.9444881075312360002278538142 d	$2^3 \cdot 3^7 \cdot \pi / 5^4$	+1	road
Mercury's rotation seed	368.414220120128092057601304103	$2 \cdot 5^6 / (3^3 \cdot \pi)$	-1	road
Mercury's orbit, G2 face	87.9524163561959821561453673696 d	$5^6 / (2 \cdot 3^2 \cdot \pi^2)$	-2	room
Mercury's rotation in hours	1407.23866169913571449832587791 h	$2^3 \cdot 5^6 / (3^2 \cdot \pi^2)$	-2	room
the precession	5599.22472798602242785105081399	$2^2 \cdot 5^8 / (3^2 \cdot \pi^3)$	-3	road

Mercury's orbit has two faces, one G-bond step apart, and they have opposite parity. The G2 face is a room: the thing that goes round, the orbit we watch and see no flip in. The G1 face is a road. And the twenty-one centimetre line sits on the G1 face:

The line on Mercury's road. $T_{G1} \times 24 = \lambda_{21} \times 100$. Worked: $87.9444881075312360002278538142 \times 24 = 2110.66771458074966400546849154$, and $21.1066771458074966400546849154 \times 100 = 2110.66771458074966400546849154$. The two addresses, $2^3 \cdot 3^7 \cdot \pi / 5^4$ and $2^4 \cdot 3^8 \cdot \pi / 5^6$, differ only by 24 and the handle 100, so the identity is exact, not approximate.

So the framework never claimed that the thing we watch going round should flip. It placed the twenty-one centimetre line on the other face of the same orbit — the face that is a transport. The face we watch is not the face the line is on. The book already reads the hydrogen spin-flip as the Mercury–Sun register crossing; this is the address that says so.

3 · Mercury Is the Planet That Flips After Every Orbit

And the observation said to be missing is not missing. It belongs to Mercury, and only to Mercury.

Mercury's orbit (G1)	87.9444881075312360002278538142 days	
Mercury's rotation	58.6296587383541573334852358761 days	= orbit $\times$ 2/3
rotations in one orbit	1.5	
rotations in two orbits	3	
Mercury's solar day	175.888976215062472000455707628 days	= two of its years

Three rotations in two orbits means that, read against the Sun, the planet turns half a turn each orbit. After one orbit the face that faced the Sun faces away. After two orbits it is restored. Every other planet brings its Sun-facing hemisphere back after one rotation; Mercury needs two orbits to come

home — and Mercury is the planet the twenty-one centimetre address points at.

Two turns to come home. A spin-one-half object needs two full turns, 4π , to return to itself; one turn of 2π takes it to minus itself. The proton and the electron of the twenty-one centimetre pair are each spin-one-half. Mercury needs two orbits to return its face to the Sun. The shapes match, and the match is offered as a parallel and nothing more, for two reasons stated now. The spinor's two turns are a property of rotation itself, while Mercury's two orbits are a ratio between two periods; to make the parallel a derivation, the framework would have to produce the two-turn return from the three-to-two lock and show that its two sheets are the helix's two strands, and that has not been done. And the three-to-two lock is built into the framework's Mercury — its rotation is set as the orbit $\times 2/3$ — so the flip after every orbit is a consequence of that construction and cannot be turned round and counted as independent confirmation.

4 · The Antimatter Reading Must Be an Inversion

The reverse flip invites the reading that it is the crossing between matter and antimatter. The framework's own rules constrain that reading tightly. The lattice is a group of positive numbers under multiplication: it is not closed under addition, so a sum cannot be a lattice operation; it contains no minus one, so a reflection cannot be a lattice element; and its only involution is inversion — the second strand stands as C divided by the first, for a registered C .

So if the flip is the crossing between the strands, it must be a quotient, not a sign change. “The spin reverses” describes a reflection, and a reflection is exactly what the lattice does not contain. Either the two hyperfine states stand as x and C/x for a registered C , or the flip is not that crossing. The difference in energy between the two states is barred as the place to look — a difference is not a lattice operation. The ratio of the two state energies is the quantity the framework is entitled to ask about, and it has not yet been computed.

What would settle it, declared before anything is run. The claim: the two hyperfine states stand as x and C/x , an inversion. The search: $C = 2^a \cdot 3^b \cdot 5^c \cdot \pi^d$ with $|a|, |b|, |c| \leq 8$ and $|d| \leq 3$. The control, run first and reported whichever way it falls: the density of that search at the tolerance the reading carries. And C may not be reached by any route that has already used the twenty-one centimetre line, because a value worked back from its target is an identity, not a finding.

Until that is run, the antimatter reading of the flip is a proposal.

5 · One Source: the Proton

The line's source can be named. Hydrogen's ionisation energy, the hydrogen spectrum, the Fraunhofer lines, the twenty-one centimetre line and the helix of DNA share one source, and it is the proton. The step between the G1 and G2 registers is the G-bond, $1 + \delta_G = 1.000090150603356200676414 (5^{10}/(2^4 \cdot 3^9 \cdot \pi^3))$.

The proton. $m_p = 1.67261635889322291988028097428 \times 10^{-27} \text{ kg } (3 \cdot 5^5 \cdot \sqrt{10^{11}/\pi})$. It carries a square root, and that decides what follows: read as it stands, the proton gives one face of hydrogen's blue line; squared — opened out — it gives the other.

As it stands, the proton gives the spectrum. The blue line times the proton's mass is a pure power of the lattice:

$H\beta \times m_p = (12/\pi)^5 = 813.124162828260013925032610104$. $H\beta = (12/\pi)^5 \div m_p = 486.139070985953763744711509159 \text{ nm } (\sqrt{2^{27} \cdot 3^8 / (5^3 \cdot \pi^9)})$. From that one line the series follows by the Balmer rule: the limit is $\frac{3}{4} \times H\beta = 364.604303239465322808533631869 \text{ nm}$; $H\alpha = \text{limit} \times 9/5 = 656.287745831037581055360537365 \text{ nm}$, Fraunhofer's C; $H\gamma = \text{limit} \times 25/21 = 434.05274195174443191492099032 \text{ nm}$, Fraunhofer's G'; $H\delta = \text{limit} \times 9/8 = 410.179841144398488159600335853 \text{ nm}$, Fraunhofer's h.

Opened out, the proton gives the same line on the G2 register. Carry the mass down to a wavelength and a free fall, square it, and carry it back up by the day's gears:

m_p	1.672616358893222919880281
$\div \pi^2/8$	1.355771754100788651016265
wavelength	
$\div 49.50355350$	0.02738736228541399987786628
free fall	
squared	0.0007500676129525171505073103
$\times 864$	0.6480584175909748180383161
$\times 360$	233.3010303327509344937938
$\div 24$	9.720876263864622270574741
$\div 2$	4.86043813193231113528737
	$\rightarrow 486.0438131932311135 \text{ nm at its decade}$

That is $486.043813193231113528737049825 \text{ nm}$, the G2 face of the blue line, $486 \times (1 + \delta_G) = 5^{10}/(2^3 \cdot 3^4 \cdot \pi^3)$, with nothing left over.

The ionisation energy gives the same G2 line. Hydrogen's ionisation energy on the G2 register is $13.606116089006034499678053478 \text{ eV } (3^3 \cdot 5^3 / (2^3 \cdot \pi^3))$. Its third rung, one-ninth, carried through the gear $31104 = 2^7 \cdot 3^5$ that turns an energy into a circumference:

$13.606116089006034499678053478 \div 9 = 1.5117906765562260551978371978; \div 31104 = 0.0000486043813193231113528737049825$ — 486.043813193231113528737049825 nm at its decade, the same number the opened-out proton gave. On the G1 register the same two steps take 13.6048896 eV to 486 exactly, the line's integer node $2 \cdot 3^5$. The two registers stand one G-bond step apart on both sides of the ring at once.

To the twenty-one centimetre line. Three-quarters of the G2 blue line is the Balmer limit on that register; carried by $\pi^4/25$, the join from the Balmer limit into the radio band, it is the line's frequency:

The 21 cm frequency. $f_{21} = G2 \text{ H}\beta \times 3/4 \times \pi^4/25 = 1420.35258137559373122045147175 \text{ MHz}$ ($5^8 \cdot \pi / (2^5 \cdot 3^3) = 5^8 \cdot \pi / 864$). Worked: $486.043813193231113528737049825 \times 3/4 = 364.532859894923335146552787369$ (the G2 Balmer limit, $5^{10} / (2^5 \cdot 3^3 \cdot \pi^3)$); $\times \pi^4/25 = 1420.35258137559373122045147175 \text{ MHz}$. Its second face, $1420.48062701778327811503592226 \text{ MHz}$ ($5^{18} / (2^9 \cdot 3^{12} \cdot \pi^2)$), stands one G-bond step on, $\times 1.00009015060335620067641368277$, exactly.

The line's frequency is $5^8 \cdot \pi$ divided by 864 — and 864 = $2^5 \cdot 3^3$ is the ground state of the DNA helix.

To the helix of DNA. The G2 ionisation energy, turned into joules by the framework's elementary charge $e = 5^9 \cdot \pi^3 / (2^6 \cdot 3^{10}) \times 10^{-20} \text{ C}$, loses its π entirely:

The ionisation energy in joules. $IE_{G2} \times e = 3^3 \cdot 5^3 / (2^3 \cdot \pi^3) \times 5^9 \cdot \pi^3 / (2^6 \cdot 3^{10}) = 5^{12} / (2^9 \cdot 3^7) = 218.032536901291723822588020119 \times 10^{-20} \text{ J}$. And turn two of the helical ladder, $864 \times r^2$ with $r = 5^6 / (2^6 \cdot 3^5)$, is 872.130147605166895290352080476, of which a quarter is 218.032536901291723822588020119 — the same number.

Figure 2 — One source: the proton, carried to five domains

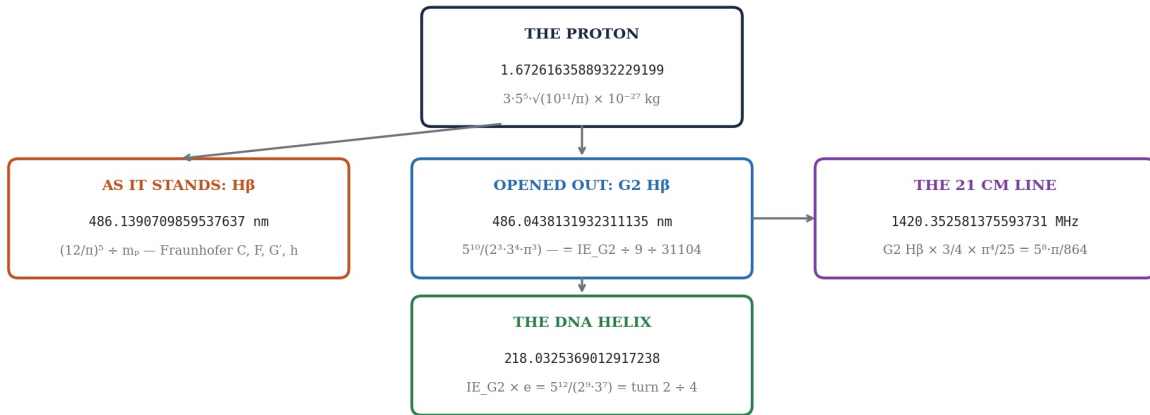


Figure 2 — One source, five domains. The proton as it stands gives Hβ and Fraunhofer's hydrogen lines; opened out it gives the G2 blue line, where the G2 ionisation energy lands too; three-quarters of that, times $\pi^4/25$, is the 21 cm line, $5^8 \cdot \pi / 864 \text{ MHz}$; the ionisation energy times the charge is a quarter of turn two of the DNA helix.

The sixth domain, the periodic table, is not yet on the ring. It is reached from the ionisation energy through the atomic weights, not from the proton, and that route is open.

6 · What Stands, and What Is Open

Stands — the address. $T_{G1} \times 24 = \lambda_{21} \times 100$, exact, the operator a bare 24.

Stands — the parity. The twenty-one centimetre line sits on the road face of Mercury's orbit, not on the room face. The framework never asked the thing we watch going round to flip.

Stands — one source. The proton as it stands and opened out, the G2 ionisation energy, the twenty-one centimetre line and turn two of the DNA helix close on one ring.

New — Mercury is the one planet that flips after every orbit and returns after two, and it is the planet the address points at.

Does not stand — “the electron flips every orbit.” It is the ground state; there is no orbit; one atom makes the transition about once in eleven million years.

Open — whether the flip is the matter–antimatter crossing. The framework's own rules make it an inversion, x and C/x , and the two states have not been produced in that form. The search is declared in section 4.

Open — the spinor parallel. Two turns to return, in both; the derivation that would join them has not been made, and the three-to-two lock cannot

supply it because the lock is built, not found.

A Note on the Numbers

Every value in this paper is given at full precision, because the precision is the evidence: a quantity truly on the $\{2,3,5,\pi\}$ lattice does not approximate a lattice form, it is one. The physical number leads and its lattice form follows in brackets. The measured values quoted — the transition rate, the lifetime — are observations, used as they are and scored against nothing. And a number in this framework is not the measurement of one thing. It is one address that surfaces as a period, a wavelength, a frequency, an energy or a turn of a helix, depending only on the register in which it is read — here the same register carries Mercury's orbit and the radio line of hydrogen.

References

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Universal Force of Time = the creation of life = the healing of life = the destruction of life
