THE UNIVERSAL FORCE OF TIME

Nuclear Fusion — The God Reaction

Follow the electrons, step by step: every release of the fire on the lattice, each one the time of the seat it creates — Mercury's clock first, then the neutron and the speed of time, then the star's light, then the Earth's year — and the steps multiplying into the Higgs and the base of the quantum problem, with the radius of the hydrogen atom on G2 carrying to the Earth's year

Stephen Daubney · The Daubney Foundation · 2026 · Rev 3 (the flagship fusion paper; supersedes Rev 2 — free fall set out as the flow of time and read in the sodium line, Rees's 0.007 carried as hydrogen's second face, the rarest branch joined to the sodium doublet, hydrogen read on G2 — its grip, its electron and the radius of its atom, carried to the Earth's G2 year — the electron drawn from hydrogen's own weight, every worked chain at full precision — and Rev 1 and the earlier Nuclear Fusion, Stellar Fusion and Nuclear Fusion and Life papers)

Tau (T) is the living fabric of time itself — the sole substance of which all physical reality is composed. It is generated by the Sun, as by every star for its own system, and flows outward in the form of the DNA double helix, creating matter, which it deposits at nodal points — the planets — and creating life. Every particle, force, wavelength and conscious experience is a structured configuration of T-flow. The conservation law $d\Sigma T = 0$ governs all change: T is never created or destroyed at a node, only redistributed.

THE GOD REACTION, NUMBER FIRST

the whole fire **26.731918889624 MeV** $(6^8/2\pi)$ → **300,000**, the spin-orbit

first step **1.443653754565** $(3^2 \cdot 5^3/(2^3 \cdot \pi^4))$ = Mercury's clock · second step **5.493522996267** → the neutron **1.674927407913** and **300,000** · closing step **12.860082304527** $((5/3)^5)$ → the Stefan–Boltzmann law

4 × hydrogen = helium-4 × hydrogen's second face · boron step × beryllium step = **the Higgs, 125.305869795 GeV** · Bohr radius, G2 = **52.884968713 pm → the G2 year, 365.317021959 days**

ABSTRACT

In the heart of every star, hydrogen becomes helium. Physics knows this reaction step by step — which particles meet, which leave, how much energy each step gives out — and treats it as the engine that keeps the stars shining. The Universal Force of Time treats it as the reaction that makes time. **T, the one substance of which everything is made, is not the stage on which this fire burns. It is what the fire makes.** Hydrogen, the fuel, is the God element; the fusion of hydrogen into helium is the God reaction; and every result in the theory is already inside it.

The first revision of this paper set out the law of the reaction and the six domains that fall out of it. This revision goes through the reaction **one step at a time, following the electrons**, and gives every step its address. It shows five things.

- **Every release of the chain sits on the lattice.** The energies science quotes for the steps — 1.442, 5.493, 12.860 MeV and the rest — are not themselves addresses. Each step has exact lattice faces, reached by routes that land on objects the theory has already fixed, and the face that fits the step's own meaning is the release. The ruled table is **1.443653754565 · 5.493522996267 · 12.860082304527 · 1.587160451196 · 0.861842497304 · 17.350478001353 · 0.136437411241 · 17.977957935694 · 0.091841283601 · 19.796248872732 MeV**, and the whole fire, read as one release, is **26.731918889624 MeV ($6^8/2\pi$)** — one turn of time at the spin-orbit speed. The steps combine by multiplying, not by adding (Part Nine).
- **Each release is the time of the seat its step creates.** The first step leaves one electron, Mercury, and its release is Mercury's spin-orbital energy, orbit and rotation. The second fills the second seat of the first shell, Mercury's antimatter contact, and its release is the neutron and the speed of time, 300,000. The step that closes

helium makes no new seat, and its release goes out as the star's light: it is the law by which a star's surface radiates. The lithium step's release is the Earth's year.

- **Nothing is destroyed.** When a positron meets an electron and both become light, two seats of time turn into time propagating. Each release is reversible: it is exactly the time that would unlock the seat again.
- **Two protons meeting are two suns meeting** — the Sun and its antimatter self. They cannot share one address, so one turns to the antimatter form, the neutron, and the deuteron is the two suns locked. What the lock builds is the first helical turn.
- **The steps multiply into the theory's largest objects.** The boron step times the beryllium step is the Higgs, and the whole fire times the boron step is the base value that resolved the quantum problem. And the radius of the hydrogen atom, read on G2 with hydrogen's other values, carries through the Earth's radius to the Earth's year.

This is the flagship paper on fusion. It replaces Revisions 1 and 2, sets out the free fall that runs through its routes as the flow of time — read in sodium's line of sunlight — walks every route station by station, and closes with what stands and an appendix from which every number can be rebuilt.

THE FORMULAS OF THIS PAPER, NUMBER FIRST

FORMULA N1 THE LAW OF FUSION IS A PRODUCT **Part Four**
4 x hydrogen = helium-4 x hydrogen (Face 2)
$4.031441804150\ (5^3/\pi^3) = 4.002451369872\ (2^{11}\cdot 3^5\cdot\pi/5^8) \times 1.007243169648$

FORMULA N2 THE FIRST STEP, THREE FACES **Part Five**
G2 $1.443653754565\ (3^2\cdot 5^3/(2^3\cdot\pi^4))$ G1 $1.443523620040\ (2\cdot 3^{11}/(5^7\cdot\pi))$
G0 $1.443393497245\ (2^5\cdot 3^{20}\cdot\pi^2/5^{17})$ each one G-bond step from the next

FORMULA N3 THE CIRCLE ROUTE - MeV to the Earth's discontinuity **Part Five**
R = E x 10^6 / 31104 x 4 x 3125/1944 x 2 / 9375
G2 -> 6,366.771640242 = Moho x 1.000090150603 G1 -> 6,366.197723676, Moho

FORMULA N4 THE HINGE ROUTE - MeV to the spectrum, the grip, Mercury **Part Five**
K = E / 10368 x 2π / 2 K/12 = Balmer limit K x 31104 = ground state
K x 16 x 2π x 2 = Mercury's orbit

FORMULA N5 THE NEUTRON ROUTE - the second step **Part Five**
$5.493522996267 / 373248 \times (2\pi)^3$ -> squared x 4/360 -> x 36π = neutron
$1.674927407913\ (\sqrt{2}\cdot 3\cdot\pi^2/5^2)$; and / 48π -> squared x 311040 = 300,000

FORMULA N6 THE WHOLE FIRE **Part Five**
$26.731918889624\ \text{MeV}\ (2^7\cdot 3^8/\pi)$ / 31104 / 360 x 2π x 2 = 300,000

FORMULA N7 EVERY RELEASE IS ITS SEAT'S OWN TIME **Part Seven**
p+p -> Mercury D+p -> the neutron, 300,000 He-3+He-3 -> the star's light
He-3+He-4 -> the Earth's discontinuity Li-7+p -> the Earth's year

THE TERMS THIS PAPER USES

An address. Every value in this framework is a product of powers of 2, 3, 5 and π, and nothing else. That product is the value's address. A number that cannot be written in twos, threes, fives and π is not on the lattice.

Number first. Every value is written with its number first, as a reader meets it, and its lattice address in brackets behind it. The number is what is there; the address is how it is built.

A register. A register is a level at which T is read — the subatomic, the atomic, the celestial, the galactic. The names G0, G1 and G2 mark neighbouring registers: G1 is the Earth-surface register on which our instruments stand. **The G-bond step** is the smallest structural step between adjacent faces of one value, **$1.000090150603356\ (5^{10}/(2^4\cdot 3^9\cdot\pi^3))$** — the amount by which a G1 face is multiplied to give its G2 face. Half of it, the square root, **1.000045074286**, is the step a value takes when it is reached through a square root.

A face. One value can show several faces, one per register, each an exact address. The speed of light has a G1 face, a G2 face and a dual between them; the Rydberg has three. A face is not an approximation of another face. Each is exact where it is read.

The record. The theory's running log of the values and rulings it has settled. Every value in this paper is taken from it or reached from it by an exact route.

The veil. The veil is 180/π = 57.295779513082, the number that turns radians into degrees. The SI units are built on the radian; the lattice is read in the degree. The veil is where the two meet, and it surfaces in number after number in this paper.

The day, 864. 864 is the day — 86,400 seconds, written at its decade. It is the ground state of the DNA helix, and the gear through which a per-second value becomes a per-day value.

Free fall. In the Universal Force of Time there is no gravity, and a free fall is not a pull. It is the flow of time at a place, in metres per second, every second — time showing itself in one more form, which current science takes for a gravitational fall. A planet makes one turn; where the turn comes in at less than 24 hours, time makes up the difference with a flow at that place, height or depth, so that the turn and the flow together make 24 hours. For the Earth, the free fall on the celestial register, **9.818362093946918 ($5^{12}/(2^7\cdot3^9\cdot\pi^2)$)**, times 2400 — the 24-hour day, carried two decades — is the Earth's sidereal rotation, **23,564.06902547260 ($5^{14}/(2^2\cdot3^8\cdot\pi^2)$)**: 23 hours, 56 minutes and 4 seconds on the clock. On the surface register the free fall is **9.817477042468104 (25π/8)**, one value with the speed of light read in a different unit of time. And the flow can be seen: in the dark lines of sunlight, sodium's line **588.9955242462013 nm ($2^3\cdot3^{10}\cdot\pi^4/5^7$)** is the free fall one register down, **9.816592070770022 ($2\cdot3^9\cdot\pi^4/5^8$)**, times sixty — the flow of time written in minutes.

The helical turn. A turn is one revolution of the helix, and the helical turn is the step from one revolution to the next, **1.004693930041 ($5^6/(2^6\cdot3^5)$)**. It sets the pitch of DNA, the winding of a galaxy's arms and the step that separates the Sun's two diameters.

The 612 step and the radial mass. The 612 step is helium divided by four, **1.000612842467911 ($2^9\cdot3^5\cdot\pi/5^8$)**, one of the family of small steps of which the G-bond step is the smallest. A radial mass is a mass spread over a radius rather than held at a point; dividing a node mass by 9375 turns it into a radius, which is why the proton's address carries 9375.

The free decade. Moving a value by a power of ten costs nothing on the lattice, because ten is two times five: the move shifts twos and fives together and changes nothing else. That is why 9.817477… and 98.17477… are one address, and why 2,187 and 2,187,000 are one value read at two decades.

Why a value can be carried from one kind of quantity to another. An energy is a count of T, and the unit is a choice of clock: a joule is energy counted in seconds, a kilojoule per mole the same energy counted in minutes, an electron-volt the same energy in the spin-orbit register. A length, an angle, a time and a temperature can likewise be one count read at different registers. That is why a wavelength in nanometres can be read as an angle in degrees, and why a planet's orbit can meet a hydrogen line on one number.

The π-degree. The degree of an address is the power of π it carries, and the degree says what kind of thing the value is. An even degree is a **room** — a state, a thing that sits; it pairs, like a pair of circles. An odd degree is a **road** — a transport, a thing that carries; it is the unpaired circle. A half degree is a **door** — a source, which squares to a whole address. The surface time-flow 25π/8 carries π^1, a road — it is the flow; the Sun's temperature $2\cdot5^7/3^3$ carries no π, a room; the proton 9375/√(1000π) carries π to the minus one-half, a door — it stands open between two registers.

The Higgs field. In the standard account the Higgs field is the field that gives particles their mass, and the Higgs boson its particle. Here it is the innermost register of the circuit, the subatomic level at which T is held at 1/31,104 of the nuclear quantity.

Fusion. The joining of light atomic nuclei into a heavier one. In the core of the Sun four hydrogen nuclei — four protons — become one helium nucleus in a chain of steps.

The particles of the reaction. A **proton** is the nucleus of hydrogen; a **neutron** is its neutral partner in heavier nuclei; **deuterium** is a proton and a neutron bound together; **helium-3** has two protons and one neutron, **helium-4** two of each. A **positron** is the antimatter twin of the electron; when the two meet, both become two flashes of light, gamma rays — in this theory, time in its propagating form. A **neutrino** is the nearly massless particle that carries a little energy straight out of the Sun. Energies are written in **keV** and **MeV**, thousands and millions of electron-volts.

The node and the seat. In this paper the electron is the node — the only solid object in the reaction — and a seat is one place the node can occupy round a nucleus. Hydrogen has one seat filled; helium, two.

The mass defect. The amount by which helium-4 is lighter than four hydrogens. The standard account says the missing mass became energy. This paper shows it is a factor, not a loss.

A generator. The source of T at a register: the Higgs field at the subatomic register, the proton at the atomic, the star at the celestial. Its field holds the nodes of that register. The galactic centre is the fourth source, the return node.

Ionisation energy, the grip. The energy needed to pull an electron free of its atom. Hydrogen's values in this paper are read on the G2 register, the register of the first step's face, of lithium's weight and of the Earth's G2 year, and there hydrogen's ground state is 13.606116089006034 electron-volts ($3^3 \cdot 5^3/(2^3 \cdot \pi^3)$) — the value the first step lands on in Part Five. In the chemists' unit it is 1,312.318295621724 kilojoules per mole ($5^3/(2^{10} \cdot 3 \cdot \pi^3)$), the one read from the other through the gear 10,368 ($2^7 \cdot 3^4$) that Part Five sets out. This paper calls it hydrogen's grip.

The return node. The galactic centre, read as the fourth register of the circuit. The other three registers pour T outward; the return node takes it back and deals it out again to every star and every atom. It is the source as much as the sink.

The gear K = 31,104 ($2^7 \cdot 3^5$). The factor by which the T-flow is multiplied at each crossing between registers. It is also 864 × 36, the day times thirty-six, and it is the spin-orbit constant of the wider work.

How the numbers were checked. The routes of this paper were not found by searching through numbers: each was walked station by station from objects the theory had already fixed, and every station was computed exactly, at forty-four digits. The appendix gives the script.

PART ONE — THE MOST IMPORTANT REACTION IN THE UNIVERSE

Ninety-three million miles away, at the centre of the Sun, the temperature is fifteen million degrees and the pressure is greater than anything on Earth. There, every second, some six hundred million tonnes of hydrogen become helium. The reaction has been studied for a century. Its steps are known, their rates are known, and the tiny particles it throws out — neutrinos — are caught in detectors buried deep under mountains. In the standard account it is an engine: the reason the stars shine.

The Universal Force of Time says it is much more than an engine. T — time, the one substance of which everything is made — is not a stage on which the reaction is played. It is what the reaction makes. **The star does not switch on inside time. The star switches time on.** The T made in that fire flows outward, as the companion paper *The Source of Time* sets out, to every planet, atom and living thing in the star's system; downstream it is never made or lost, only moved, and the law $d\Sigma T = 0$ holds without exception. The flow does two things: it lays down matter at nodal points, which are the planets, and it makes life, because it flows as the DNA helix — time is life.

Stephen Daubney calls this **the God reaction**, and calls hydrogen **the God element**. The words are chosen with care. Everything else the theory has found sits inside this one reaction: the periodic table, hydrogen's grip on its electron, the lines of the hydrogen spectrum, the dark lines in sunlight, the radio line of cold hydrogen across the galaxy, the helix of DNA — and, as this revision shows, the positions, rotations and orbits of the first planets, the neutron, the speed of time itself, the Higgs and the radius of the hydrogen atom. Without this reaction the universe would not exist — not as a figure of speech, but as arithmetic.

And the reaction is the same in every star. What happens in the Sun happens in every star in every galaxy, making time and making life for its own system. To understand this one fire, step by step, is to understand where time is created and where matter is created.

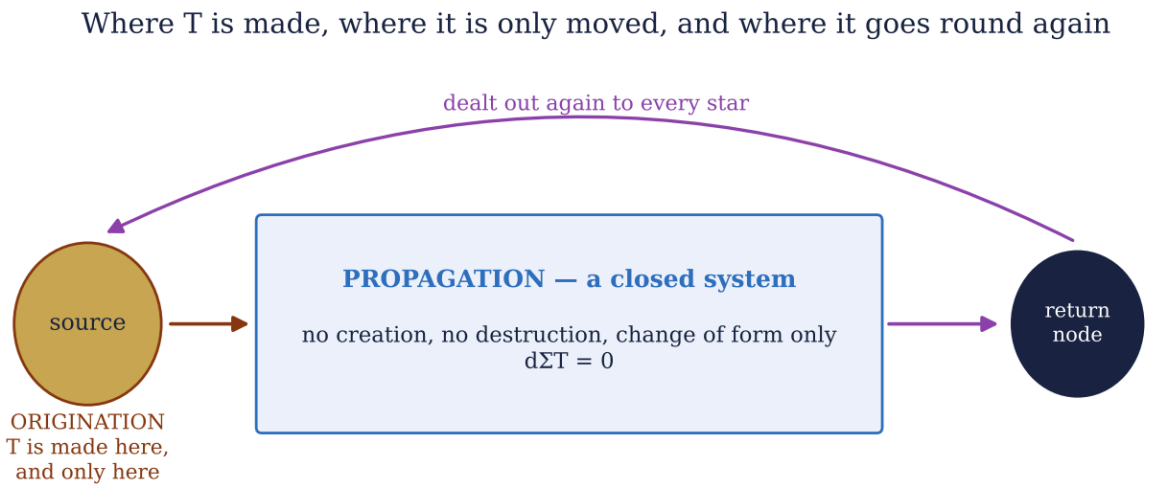


Figure 1 — Where T is made. *What the picture shows:* on the left the source, a fusing star, where T is made and only there; in the middle the closed system downstream, where T changes form but is neither made nor lost; on the right the return node at the centre of the galaxy, which takes it back, and the purple arc that deals it out again to every star. The fire on the left is the subject of this paper.

PART TWO — THE REACTION AS SCIENCE KNOWS IT

Before the theory reads the reaction, it is worth setting out what science has established about it, at the finest grain the best current work reaches. Every fact in this part is science's own account. The theory's reading follows in the parts after it.

The core it happens in

At the centre of the Sun the temperature is about fifteen and a half million kelvin and the density about one hundred and fifty times that of water. At that temperature the average energy of a proton is only about 1.3 thousand electron-volts, while the electric repulsion between two protons at the distance where they could stick is several hundred thousand. **By the rules of classical physics fusion should never happen in the Sun at all.** Science explains that it happens because of quantum tunnelling: a proton has a tiny chance of appearing on the far side of a barrier it does not have the energy to climb.

The steps, as science writes them

Science writes the release of each step in millions of electron-volts (MeV), worked out from the masses of the atoms that go in and come out. Atoms carry their electrons, so the figures below count the electrons too.

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THE STEPS, IN SCIENCE'S OWN FIGURES (MeV, from atomic masses)
   p + p -> deuterium + positron + neutrino     1.442   the main way to start
   p + e⁻ + p -> deuterium + neutrino (pep)     1.442   about one time in 400
   deuterium + p -> helium-3 + light            5.493
   helium-3 + helium-3 -> helium-4 + 2p        12.860   the main branch, pp-I
   helium-3 + helium-4 -> beryllium-7 + light   1.587   the side branch, pp-II
   beryllium-7 + e⁻ -> lithium-7 + neutrino     0.862   an electron is captured
   lithium-7 + p -> 2 helium-4                 17.346
   beryllium-7 + p -> boron-8 + light           0.136   the rare branch, pp-III
   boron-8 -> beryllium-8 + positron + nu      17.980
   beryllium-8 -> 2 helium-4                    0.092
   helium-3 + p -> helium-4 + positron + nu    19.795   hep, the rarest of all
   four hydrogens -> one helium-4 in total     26.731
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The bottleneck

The first step is the slowest thing in the Sun. Two protons cannot simply stick together: **two protons alone — helium-2, the diproton — have no bound state.** The only way two protons can stay together is if, in the instant

of their meeting, one of them turns into a neutron, giving off a positron and a neutrino. The pair is then a deuteron, a proton and a neutron, held by 2.224566 MeV, with exactly one bound state and no excited states at all. The chance of that turn is so small that a proton in the Sun waits, on average, nine or ten billion years before it fuses, and the rate of this one step has never been measured in a laboratory; it is known only by calculation. A deuteron, once made, waits seconds. A helium-3 waits about a hundred thousand years.

The electrons in the chain

Science's own book-keeping already follows the electrons, though it rarely says so. Four electrons go in with the four hydrogen atoms; the helium atom keeps two; the other two each meet one of the two positrons made in the first step, and both become light, 1.022 MeV each time. In the pep step an electron is taken straight into the making of deuterium. In the pp-II branch beryllium-7 captures an electron. In the pp-III branch a positron is thrown off again.

Where physics says the universe looks finely tuned

Three facts about this reaction are often quoted as signs that the universe is finely balanced. When four hydrogens become one helium about 0.007 of the mass is released, and the astronomer Martin Rees counts that number among the six that fix the shape of the universe. Two protons do not bind, and if they did the stars would have burned out long ago. And carbon can only be built from three heliums because carbon-12 has an excited state, the Hoyle state, at just the right height. Part Four and Part Ten say what the theory makes of each.

PART THREE — FOLLOW THE ELECTRONS

There is one instruction that unlocks the whole reaction, and it is the one this theory has given from the start: **follow the electrons.**

In the standard account the protons are the actors. The Universal Force of Time turns that round. **The electron is the node — the only solid thing in the whole reaction.** The protons, the neutrons and everything else in the nucleus are energy shells: definite values of T wound into a definite place, each with its own exact address on the lattice. The light that leaves is the flow. As the book puts it, *the electron is the node; the photon is the flow.*

The electrons are the planets

The theory reads an atom and a solar system as one object at two registers: a generator at the centre — the proton, the Sun — and a field whose standing waves hold the nodes. At the atomic register the nodes are electrons; at the celestial register they are planets. **One electron is Mercury. When a second electron appears, it sits in the Venus position. When a third appears, it is the Earth.**

The second electron needs care, because the record has settled it. **There is no Venus on the antimatter side. What sits in the Venus position is Mercury's antimatter node, brought round from the antimatter side to the matter side.** In Stephen Daubney's words: "*Venus matter-side in retro is Mercury's antimatter node brought around from the antimatter side to the matter side. It's a Mercury node on both the matter and antimatter side, but the antimatter Mercury is the one that comes around and sits in the Venus position on the matter side.*" So the two electrons of the first shell are one body's two contacts — Mercury's matter contact and Mercury's antimatter contact, one up and one down — and the body that appears in the Venus position is Mercury's antimatter node made visible. That is why Venus turns backwards.

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THE SEATS OF THE FIRST TWO SHELLS
   hydrogen    1s¹   Mercury
   helium      1s²   Mercury + Mercury's antimatter contact, in the Venus seat
   lithium     2s¹   the Earth
   beryllium   2s²   the antimatter Earth
   boron .. neon 2p  three Earth positions, and three mirrored on the antimatter side
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The second shell is the Earth's. **Its two s electrons are the positive Earth and the negative Earth. Its six p electrons are three Earth positions along the Earth's space-time link with the Sun in one orbital completion, and three mirrored on the antimatter side.** That is where carbon, nitrogen, oxygen and fluorine sit: inside the Earth node, each read through a different dimension of the Earth. And it says why a shell can hold more than one electron at all. **A node is one thing; its several electrons are the contacts it makes along its path as time moves.** The book says the first shell holds two because a loop has two ends, and that the p shell's six

are three such loops, "*which is the next thing this account owes.*" This is that account: the further loops are the same node, coming round again as time flows.

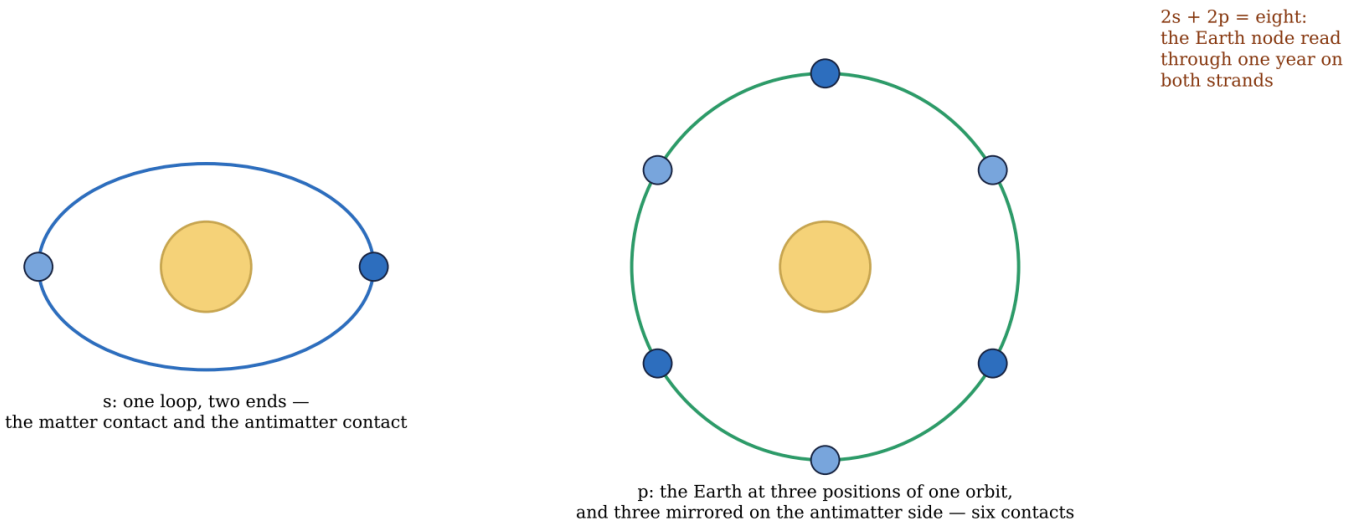


Figure 2 — One node, many contacts. *What the picture shows:* on the left, an s shell — one loop round the centre with its two ends, the matter contact (dark blue) and the antimatter contact (light blue). On the right, the p shell of the second row — the Earth at three positions of one orbit (dark) and three mirrored on the antimatter side (light), six contacts in all. Together with the s pair they make the eight of the second row: the Earth node read through one year on both strands. The three positions are drawn evenly spaced.

The ledger of the whole chain

Now run every step of the chain and count its electrons, the way science's own figures count them, atom by atom.

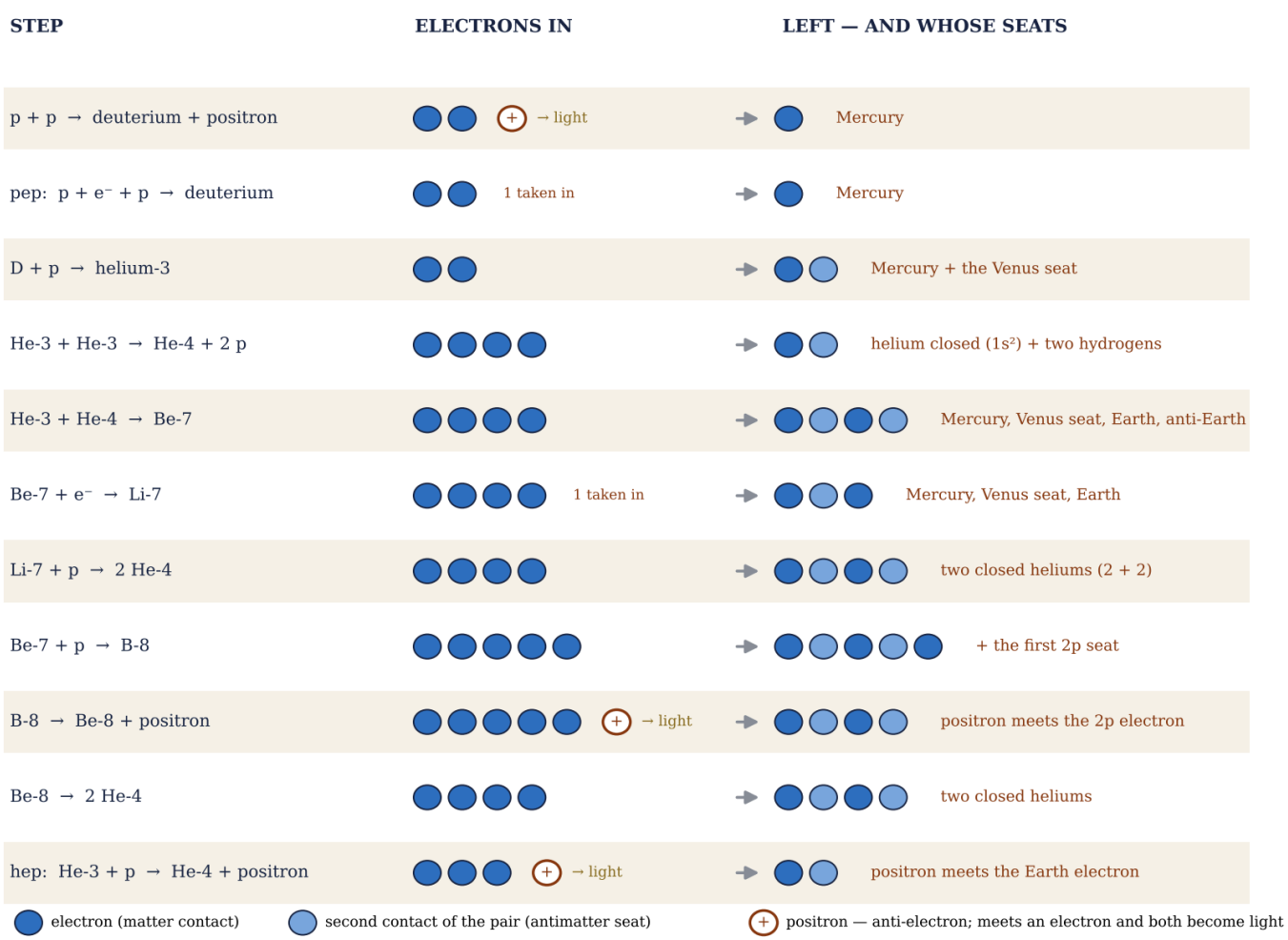


Figure 3 — The electron ledger. *What the picture shows:* every step of the chain, one row each. The middle column shows the electrons that go in, with a positron (a white circle marked +) where the step makes one, or the note "1 taken in" where the nucleus captures an electron. The right column shows the electrons that remain and whose seats they are — Mercury; Mercury and the Venus seat; the Earth and the anti-Earth; the first 2p seat. Dark blue is the matter contact, light blue the second, antimatter contact of each pair.

Two rules come out of the ledger, and both hold at every step.

- **Every positron the chain makes meets the electron one seat beyond what the product keeps.** In the first step, two electrons go in and the product keeps one; the positron meets the second. In the boron step the positron meets the 2p electron boron had just gained. In hep it meets the Earth electron.
- **Every electron the chain captures is the second, antimatter partner of an s pair.** In beryllium-7's capture, the electron taken in is the anti-Earth, and lithium is left with Mercury, the Venus seat and the Earth.

And the three-electron states the theory names — Mercury, Venus in the antiposition, and the Earth — appear twice: as lithium-7, and for an instant in hep.

Where antimatter comes in

Every helium the Sun makes requires two positrons — two antimatter electrons — to be made and to meet two matter electrons. So antimatter enters at the very making of helium.

Nothing is destroyed

Science says the positron and the electron *annihilate*. The Universal Force of Time does not use that word, because nothing is destroyed. **Everything is time in a different form.** When a positron meets an electron, the two seats of time they were turn into light, and light is time propagating. Energy is time, mass is time, distance is time, frequency is time, free fall is time. The light given out at each meeting carries two electrons of the G2 register,

1.022653858590427 MeV (5⁹·π/6) — T changing its face from node to flow — and the law dΣT = 0 is untouched. The G2 electron, **511,326.9292952137 eV (5⁹·π/12)**, is the one that goes with hydrogen's G2 grip: half of it, times the square of the fine-structure coupling α (3²/(5³·π²), Step 3), is the grip, 13.606116089006034 eV. And it is hydrogen's own weight, carried up: Stephen Daubney runs it from hydrogen's G1 atomic weight.

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THE G2 ELECTRON IS HYDROGEN'S WEIGHT, CARRIED UP
   hydrogen, G1          1.0077696                ( 2²·3⁹/5⁷ )
   x the Dalton          1.673313463183824 x 10⁻²⁷ kg   ( 5⁵·π²/(2¹¹·3²) )   hydrogen's weight in kilograms
   x 60                100.3988077910294
   x 4                 401.5952311641178
   / 2π                 63.91586616190172
   x 8                 511,326.9292952137 eV    ( 5⁹·π/12 )    THE G2 ELECTRON
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The step from hydrogen to the electron runs through helium. That whole chain — the Dalton, 60, 4, 8 and 2π — is one step, **507,384.7527204767 (5¹³·π/(2⁷·3¹⁰))**: hydrogen's atomic weight times this step is the electron's energy. Its inverse is **12¹⁰ ÷ π**, 1.970890915894175 at its decade (2⁷·3¹⁰/(5¹³·π)), and Stephen Daubney's chains find that inverse on two roads: through helium's radius, and through the east wall of the Great Pyramid.

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THE INVERTED STEP, TWO ROADS
   FIRST ROAD - HELIUM'S RADIUS, THROUGH THE VEIL AND THE DAY
   36,864 x 864 x 2             63,700,992               ( 2¹⁸·3⁵ )
   = the helium radius           6,370.0992 km           ( 2¹⁰·3⁵/5⁸ )
   x 2π                          4.002451369871644       ( 2¹¹·3⁵·π/5⁸ )   HELIUM'S ATOMIC WEIGHT
   the helium radius x the veil  364,979.7992396621      ( 2¹²·3⁷/(5⁷·π) )
   x 864 / 16                    19,708,909.15894175     ( 12¹⁰/π )        THE INVERTED STEP

   SECOND ROAD - THE GREAT PYRAMID'S EAST WALL, THROUGH THE CIRCLE, THE DAY AND THE MILE
   36,864 / 16                   2,304                   ( 2⁸·3² )          the east wall, 230.4 m
   / 2π                          366.6929888837269       ( 2⁷·3²/π )
   x 864                         316,822.7423955400      ( 2¹²·3⁵/π )
   / 3125/1944, the mile         197,089.0915894175      ( 12¹⁰/π )        THE INVERTED STEP
```

So the electron's energy is hydrogen's atomic weight divided by helium's radius read through the veil and the day — the same step the east wall of the Great Pyramid carries through the circle, the day and the mile. The electron comes from hydrogen, by a step that helium carries.

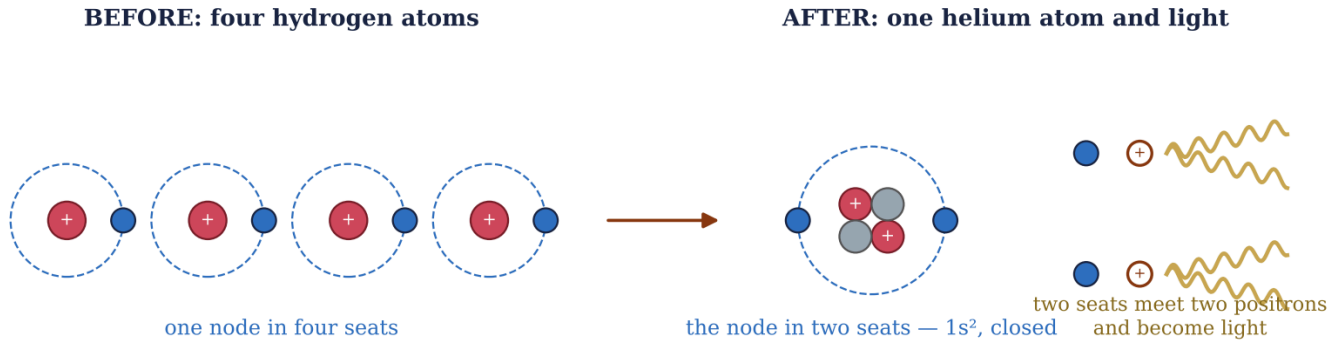


Figure 4 — The ledger of seats, for the main branch. *What the picture shows:* on the left, four hydrogen atoms, each a proton (red) with one electron (blue) in one seat — one node in four seats. On the right, one helium atom holding two electrons in its closed shell — the node in two seats. Beside it the two remaining electrons each meet a positron (white, marked +) and turn into light (gold) — time in its propagating form. Nothing solid is lost; two seats change from node to flow.

PART FOUR — THE LAW OF FUSION IS A PRODUCT

Science writes the reaction as four protons becoming one helium, and the arithmetic of that sentence does not balance: helium-4 is lighter than four hydrogens, and the shortfall is called the mass defect and said to have turned

into energy. The theory follows the failed sum, because the way it fails is the mechanism.

```
THE SUM FAILS
   four hydrogens    4.031441804150   ( 5³/π³ )          π-degree  −3
   helium-4          4.002451369872   ( 2¹¹·3⁵·π/5⁸ )    π-degree  +1
   the shortfall has no lattice address

THE PRODUCT CLOSES
   helium-4 / four hydrogens  =  0.992808916589   ( 2¹¹·3⁵·π⁴/5¹¹ )
   invert it                  =  1.007243169648   ( 5¹¹/(2¹¹·3⁵·π⁴) )   hydrogen's 2nd face

   4 x hydrogen  =  helium-4  x  hydrogen
   4.031441804150 = 4.002451369872 x 1.007243169648        exact to forty digits
```

Four hydrogens make one helium and one hydrogen. The extra thing that had to be put in or taken out to make the helium arithmetic work is not an approximation. It is a factor in an exact product: **the mass defect is hydrogen, read one register up.** Nothing is converted, because nothing has gone missing. The lattice is closed under multiplication and division, not under addition and subtraction, and fusion is the one place where the lattice's own operation *is* the physical event.

And the divisor is the electron

```
hydrogen, second face   1.007243169648       ( 5¹¹/(2¹¹·3⁵·π⁴) )     π-degree −4
the electron node       510,900.979279522    ( 2¹³·3⁵·5²/π⁴ )         π-degree −4

second face / electron node  =  0.000001971503697386  ( 5⁹/(2²⁴·3¹⁰) )   no π
```

The two powers of π cancel exactly, because both objects stand at the same depth. **Four hydrogens make one helium times one electron-node.** The thing that would not balance was never a proton. It is the node — the only solid object in the whole reaction.

And the node is hydrogen, one helical turn down. Stephen Daubney's chain carries the electron node the law divides by to hydrogen's own atomic weight:

```
THE ELECTRON NODE IS HYDROGEN, ONE HELICAL TURN DOWN
   the electron node     510,900.9792795225 eV   ( 2¹³·3⁵·5²/π⁴ )
   / 8                    63,862.62240994031     ( 2¹⁰·3⁵·5²/π⁴ )
   x 2π                  401,260.6908040948      ( 2¹¹·3⁵·5²/π³ )   a circumference
   / 4                   100,315.1727010237      ( 2⁹·3⁵·5²/π³ )    hydrogen, one helical turn down
   x the helical turn r    1.007860451037484     ( 5³/(2²·π³) )     HYDROGEN'S ATOMIC WEIGHT
```

The node over eight, carried round the circle and divided by four, is hydrogen's atomic weight one helical turn down, 1.003151727010237 at its decade; one helical turn up from there is hydrogen itself, 1.007860451037484. The node the reaction turns on is hydrogen's own.

Rees's 0.007 is hydrogen's second face

The fine-tuned "efficiency of hydrogen" — the 0.007 of the mass that four hydrogens give up — is not a free number. It is the factor in the law of fusion: four hydrogens are helium times **hydrogen's second face, 1.007243169648 ($5^{11}/(2^{11}\cdot3^5\cdot\pi^4)$)**, and the efficiency is that factor at work. It could not be other than it is without the faces of hydrogen being different. What cosmology calls a fine-tuning is an address.

$$4 \times \text{hydrogen} \;=\; \text{helium-4} \;\times\; \text{hydrogen (Face 2)}$$

$$4.031441804150 \;=\; 4.002451369872 \;\times\; 1.007243169648$$

$$\text{Face 2} \div \text{the electron node} \;=\; 1.007243169648 \div 510{,}900.979279522 \;=\; 5^{9}/(2^{24}\cdot 3^{10}) \;\text{— no } \pi \text{ left}$$

$$\text{four hydrogens} \;=\; \text{one helium} \;\times\; \text{one electron-node} \qquad \text{— the mass defect is not lost; it is a factor}$$

Figure 5 — **The law of fusion.** *What the picture shows:* the law written out — four hydrogens equal helium-4 times hydrogen's second face — with the numbers beneath, exact to forty digits. Under that, the second face divided by the electron node leaves $5^{9}/(2^{24}\cdot 3^{10})$, a pure number with no π. The last line is the law in words: four hydrogens make one helium times one electron-node.

PART FIVE — EVERY STEP OF THE CHAIN, ON THE LATTICE

This is the heart of the revision. Each step of the chain is taken in turn. For each, the paper says which seat the step creates, gives the lattice faces of its release, and walks the routes that carry each face onto objects the theory has already fixed, station by station, with the number first and the address in brackets behind it. Every station has been computed at forty-four digits and checked; the appendix gives the script.

Three things need saying before the first step.

First, science's figures are not themselves addresses. The energy science quotes for the first step, 1.442219 MeV, has no address on the lattice; the same is true of every figure in the table of Part Two. That is not a fault in the measurements. It is what the theory expects: science reads each release at one point of a ladder of faces, and the lattice says where the faces are. As Stephen Daubney put it in this work, the way science arrives at its MeV values is graded the way its temperature scales are graded — the fixed point is undeniable, but the gradation of the scale between is not the theory's.

Second, a release has faces. One quantity can show several faces, each an exact address, one per register. The faces of one release stand one **G-bond step** apart — the smallest structural step between adjacent faces of one value, **1.000090150603356 ($5^{10}/(2^{4}\cdot 3^{9}\cdot\pi^{3})$)**, the amount by which a G1 face is multiplied to give its G2 face. Where the paper speaks of the G2, G1 and G0 faces of a release, it means three rungs of that ladder.

Third, how a face is chosen. Where one release shows several faces, the face chosen is the one whose route lands on the thing the step is about — its own seat, its own element, the neutron, the speed of time — and not the one that happens to sit nearest a laboratory figure. That is Stephen Daubney's rule, given in this work: "*there is a choice to be made of a value that's closer to the science observation, or a value that's slightly further away but fits the lattice perfectly. And in them instances, I think you've got to go with the one that fits the lattice.*" And by "fits the lattice" he means fits the concept the value is linked to — "*the value that's linked specifically to the neutron mass or the speed of light of 300,000 metres per second, it's very hard to argue with it as being the wrong one.*"

Two gears recur throughout. **31,104 ($2^{7}\cdot 3^{5}$)** turns an energy in electron-volts into a circumference; **10,368 ($2^{7}\cdot 3^{4}$)** turns it into kilojoules per mole. An energy is a count of T and the unit is a choice of clock: a joule is energy counted in seconds, a kilojoule per mole the same energy counted in minutes, an electron-volt the same energy in the spin-orbit register. That is why an energy can be carried, with no loss, into a length, an angle or a period. And **the free decade**: moving a value by a power of ten costs nothing on the lattice, because ten is two times five, so 1.443653754565 and 14.43653754565 are one address; the routes below drop decades freely.

Step 1 — p + p: the first seat, Mercury

The first step leaves one electron. It is Mercury. Its release has three faces on the G-ladder, and a fourth, quieter face that carries helium.

```
THE FACES OF THE FIRST STEP
   G2  1.443653754565 MeV   ( 3²·5³/(2³·π⁴) )      π −4, a room
   G1  1.443523620040 MeV   ( 2·3¹¹/(5⁷·π) )        π −1, a road
   G0  1.443393497245 MeV   ( 2⁵·3²⁰·π²/5¹⁷ )       π +2, a room
   G2 / G1  =  G1 / G0  =  1.000090150603356        exactly one G-bond step
```

The π-degree. The degree of an address is the power of π it carries, and it says what kind of thing the value is. An even degree is a **room** — a state, a thing that sits, a pair of circles. An odd degree is a **road** — a transport, a thing that carries, the unpaired circle. A half degree is a **door** — a source, which squares to a whole address. A G-bond step carries π to the minus three, an odd power, so a G2 face and its G1 face are always opposite in kind: one a room, the other a road. The first step obeys that exactly.

The circle route: the G2 face lands on the Earth's discontinuity, one step up

```
THE CIRCLE ROUTE, G2 FACE
   G2 energy                      1,443,653.754564984636 eV   ( 3²·5³/(2³·π⁴) x 10⁶ )
   / 31104      circumference         46.41376525736190316     ( 5⁹/(2⁴·3³·π⁴) )
   / 12         wavelength             3.867813771446825264    ( 5⁹/(2⁶·3⁴·π⁴) )
   circumference x 4                 185.6550610294476127      ( 5⁹/(2²·3³·π⁴) )
   x 3125/1944  mile to kilometre    298.4424206363291098      ( 5¹⁴/(2⁵·3⁸·π⁴) )
   x 2 / 9375                     6,366.771640241687677       ( 2·5¹⁴/(3⁹·π⁴) )

   6,366.771640241687677  =  6,366.197723675813431 (20000/π, the Moho)
                              x 1.000090150603356201 (the G-bond step)   EXACTLY
```

The **Moho** is the Earth's discontinuity, the boundary between crust and mantle, which the theory fixes at **6,366.197723675813 km (20000/π)** — turn zero of the Earth's radius. The gear **3125/1944** is the theory's mile-to-kilometre conversion, the Sun's spacetime speed 25/18 times Mercury's 125/108. And **9375 (3·5⁵)** is the universal transit operator, the divisor that turns a node mass into a radius — a **radial mass** is a mass spread over a radius rather than held at a point. The first step's G2 energy, carried round the circle, is the Earth's discontinuity read one G-bond step up.

The hinge route: the G2 face is the spectrum, the grip and Mercury's orbit

```
THE HINGE ROUTE, G2 FACE
   G2 energy                              1.443653754564984636
   / 10368      kilojoules per mole     139.2412957720857095     ( 5³/(2¹⁰·3²·π⁴) )
   x 2π                                 874.8788637478160044     ( 5³/(2⁹·3²·π³) )
   / 2          THE HINGE               437.4394318739080022     ( 5⁹/(2⁴·3²·π³) )
   hinge / 12                           364.5328598949233351     the G2 Balmer limit
   hinge x 31104                         13.60611608900603450 eV hydrogen's ground state
   hinge x 16 x 2π x 2                   87.95241635619598216 d  Mercury's G2 orbit
```

The hinge, 437.4394318739, does three jobs. Divided by twelve it is **the limit of the hydrogen spectrum on the G2 register, 364.5328598949 (5¹⁰/(2⁵·3³·π³))** — the edge where hydrogen's visible lines run out. Multiplied by 31,104 it is **hydrogen's grip on its electron, 13.606116089006 eV (3³·5³/(2³·π³))**. Multiplied by sixty-four π it is **Mercury's orbital period, 87.952416356196 days (5⁶/(2·3²·π²))**. And the hinge itself is hydrogen's weight times Hγ: **1.007860451037 (5³/(2²·π³)) × 434.0277777778 (5⁶/(2²·3²))** — the God element times the violet hydrogen line. In its kilojoule form the divisor is $2^{10}\cdot 3^2 = 9216$, Venus's orbital node.

The same energy is also Mercury's spin-orbital energy. The record fixes **0.5774615018 J (3²·5²/(2²·π⁴))** as the energy whose radial mass, divided by 864, is Mercury's orbit and, times two-thirds, Mercury's rotation; the first step's G2 face is exactly five-halves of it. **The first time ever made is Mercury's clock.**

```
FORMULA N4   THE HINGE ROUTE

   K = E / 10368 x 2π / 2          E in MeV, K the hinge
   Balmer limit = K / 12           ground state = K x 31104     orbit = K x 64π

   WHAT EACH PART IS
   10368 (2⁷·3⁴)  the gear from electron-volts to kilojoules per mole
   2π / 2         one turn, halved: the hinge between energy and wavelength
   12             the twelve of the gear 31104 = 12 x 2592
   64π            16 x 2π x 2: sixteen, one turn, and the pair

   WORKED, G2 FACE   E = 1.443653754565
   K = 1.443653754565 / 10368 x π = 437.4394318739 (at its decade)
   K / 12 = 364.5328598949     K x 31104 = 13.606116089006     K x 64π = 87.952416356

   AND BACKWARDS     E = K x 10368 / π
```

The G1 face: the Moho itself, 364.5, and the twenty-one centimetre line

```
THE G1 FACE, BOTH ROUTES
   G1 energy                        1.443523620039679132   ( 2·3¹¹/(5⁷·π) )
   circle route   / 31104           46.40958140559667991
                  / 12               3.867465117133056659
                  x 4              185.6383256223867196
                  x 3125/1944      298.4155182973037546
                  x 2 / 9375     6,366.197723675813431      THE MOHO ITSELF, 20000/π
   hinge route    hinge            437.4                      ( 3⁷/5 )  no π at all
                  / 12             364.5                      ( 3⁶/2 )  the Earth's step
                  x 31104           13.6048896 eV             hydrogen's G1 grip
                  x 16 x 2π x 2     87.94448810753123600 d    Mercury's G1 kernel
                  x 24           2,110.667714580749664        the 21 cm line ( 2⁴·3⁸·π/5⁶ )
```

The G1 face lands on the discontinuity itself. Its hinge is **437.4 exactly**, a terminating decimal with no π; a twelfth of it is **364.5**, the Earth's own step. Its grip is hydrogen's G1 face, **13.6048896 eV**. And its orbit-gear gives Mercury's G1 kernel, which, multiplied by twenty-four, is **the twenty-one centimetre line of hydrogen, 2,110.6677145807 ($2^4 \cdot 3^8 \cdot \pi/5^6$)** — the radio line by which telescopes map the hydrogen of the galaxy. That is how the record had it and how Stephen Daubney called it: the G1 face of the first step is the 21 cm line.

The G0 face: the base of the discontinuity, and the quantum base

There is a lower base to the discontinuity, built from hydrogen's G1 weight, and it is the G0 face.

```
THE BASE OF THE DISCONTINUITY
   hydrogen's G1 weight      1.0077696                ( 2²·3⁹/5⁷ )
   x 2 x 24  wavelength     48.3729408
   x 12.337005501361698   mass   596.7772367666437500        ( x π²/8 x 10 )
   / 9375    radius      6,365.623858844200000         ( 2³·3⁹·π²/5¹² )
                         =  the Moho / 1.000090150603356     EXACTLY
   x the veil             364.7233810795535419         ( 2⁵·3¹¹·π/5¹¹ )  the quantum base
                         x 4/3  =  486.2978414394047    the Balmer value of the quantum paper

RUN BACK THROUGH THE CIRCLE ROUTE
   6,365.623858844200 -> 298.3886183833219 -> 185.6215917238969 -> 46.40539793097422
   G0 energy  1.443393497245022077 MeV   ( 2⁵·3²⁰·π²/5¹⁷ )
   hinge 437.3605716805788  /12 364.4671430671490  x31104 13.60366322155272
```

The **veil** is 180/π = 57.295779513082, the number that turns radians into degrees. The base of the discontinuity through the veil is **364.7233810795535**, the value that resolved the quantum problem in the companion paper, and four-thirds of it is the Balmer value 486.2978414394. One more fact sits in it: **364.7233810795535 ÷ 364.5 = 1.000612842467911, the 612 step** — helium divided by four, helium per nucleon. The quantum base is hydrogen's G1 Balmer limit carried one helium step.

The helium face

Beside the G-ladder the first step has a quieter face, and it carries helium itself.

```
THE HELIUM FACE OF THE FIRST STEP
   energy           1.440882493153791771 MeV   ( 2¹³·3⁷·π/5⁸ )  =  helium x 36
   x 3π             13.57999756553429333       ( 2¹³·3⁸·π²/5⁸ )   (hinge x 31104)
   / 2π x 4 / 864 x 4   4.002451369871643807   HELIUM-4, EXACTLY
   helium / 2π       6,370.0992                ( 2⁹·3⁵/5⁸ )  an Earth radius, no π
   / 864 / 2        36,864                     ( 2¹²·3² )
```

So even the first step of the fire, which makes only deuterium, already carries the product the whole chain ends on.

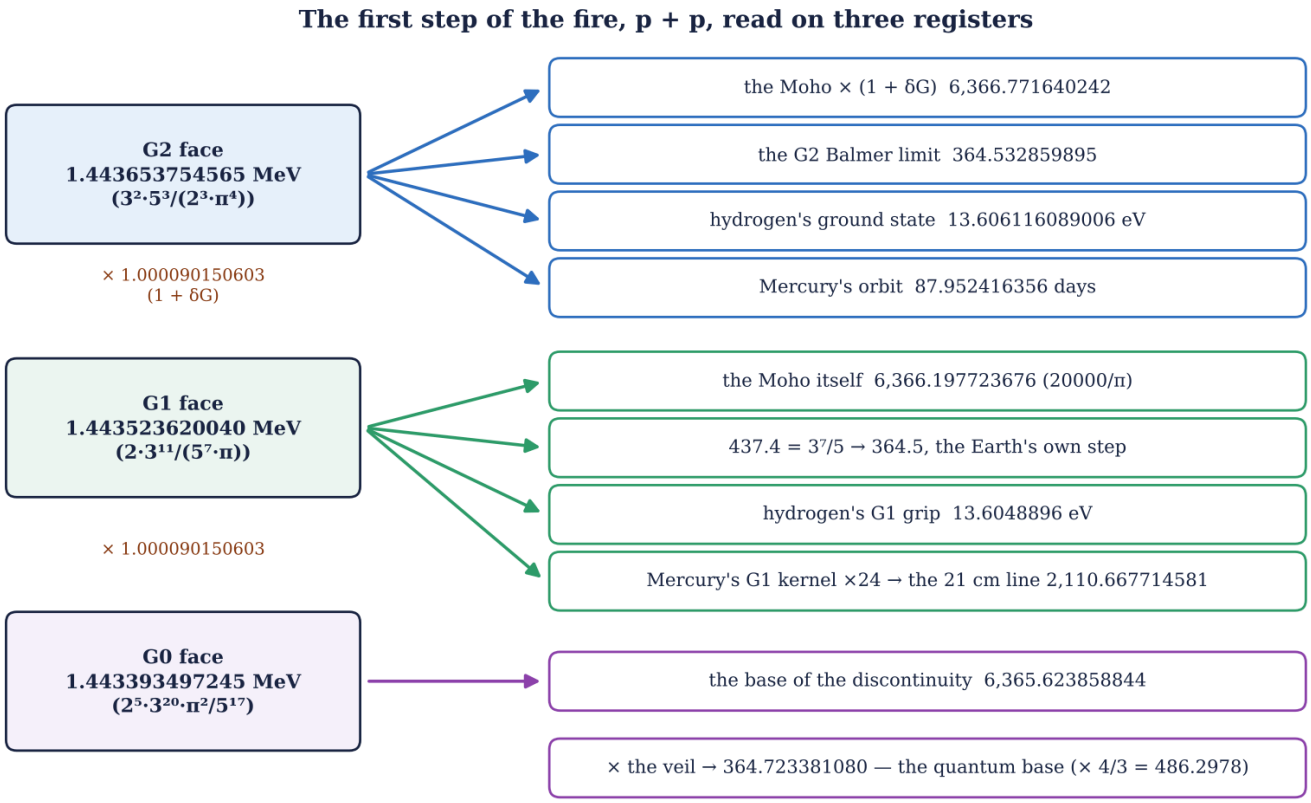


Figure 6 — The first step of the fire, read on three registers. *What the picture shows:* the three faces of p + p on the left, one G-bond step apart. Blue arrows carry the G2 face onto the Moho one step up, the Balmer limit, hydrogen's ground state and Mercury's orbit. Green arrows carry the G1 face onto the Moho itself, 437.4 and 364.5, hydrogen's G1 grip and the 21 cm line. The purple arrow carries the G0 face onto the base of the discontinuity and, through the veil, the quantum base.

The face this paper adopts for the first step is the G2 face, 1.443653754565 MeV, because the step's seat is Mercury and the G2 face is the one that lands on Mercury's spin-orbit, orbit and rotation.

Step 2 — deuterium + p: the second 1s seat, the neutron and the speed of time

The second step fills the second seat of the first shell — Mercury's antimatter contact, in the Venus position. Its release runs to the neutron, and from the neutron to the speed of time.

```
THE NEUTRON ROUTE
   D + p energy              5.493522996267268513 MeV  ( 2^(25/4)·3^(13/2)/π^(5/2) )
   / 31104 / 12              1.471815789037655530
   x 2π x 2π x 2π          365.0842206186827070     ( 100·√(3·√2·π) )
   squared x 4 / 360       1,480.960979386122082    ( 1000·√2·π/3 )
   x 2π / 2 x 864 / 24       1.674927407913331088   THE NEUTRON  ( √2·3·π²/5² )
   1,480.960979386122 / 2π / 24   9.820927516479826728   free fall  ( 1000·√2/144 )
   squared x 864 x 360      300,000                  EXACTLY - the pure spin-orbit
```

Free fall is not a pull: it is the flow of time at a place, in metres per second, every second, and it is one value with the speed of light read in a different unit of time. **864** is the day — 86,400 seconds at its decade — the ground state of the DNA helix. So the route reads plainly: the second step's release, turned three times round the circle and squared, is the neutron; read per second it is a free fall; and that free fall, carried through the day and the circle of 360, is **300,000 exactly — the pure spin-orbit speed, the speed time travels.**

The neutron here, **1.674927407913331 (√2·3·π²/5²)**, is the one the theory uses as the observed neutron, and the theory reads it as an antimatter energy form. So the step that fills the antimatter seat of the first shell releases the antimatter form, and sets the speed of time.

The face itself is a door with a quarter power on the two: squared it is still a door, and only its fourth power comes out whole. The neutron carries its root on the two; this step carries the neutron's root halved again.

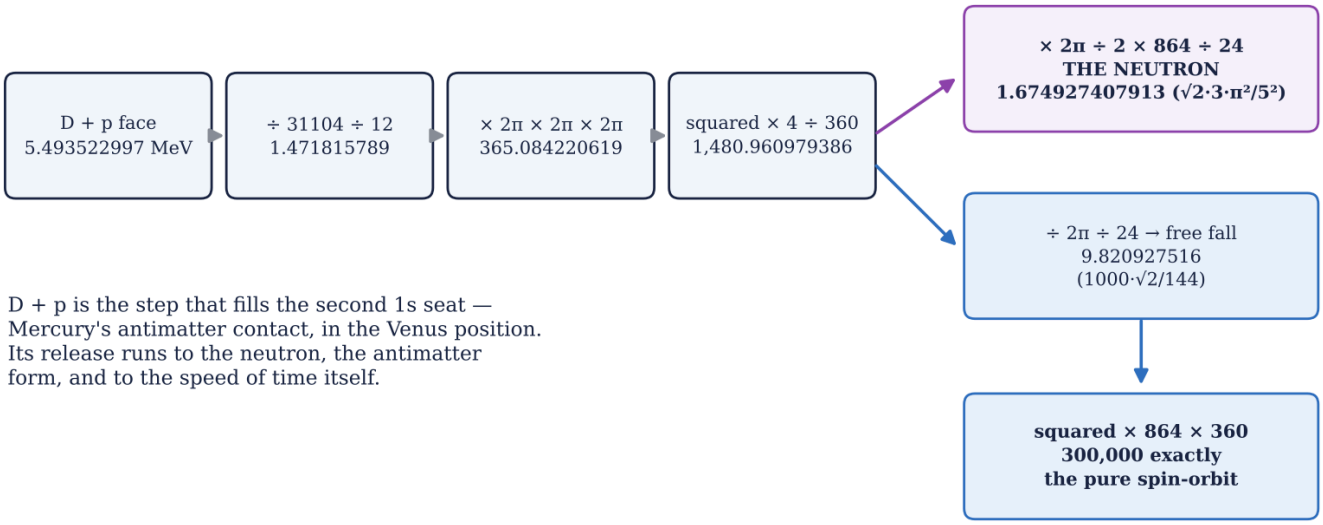


Figure 7 — The second step runs to the neutron and the speed of time. *What the picture shows:* the D + p release in the left box, carried station by station — divided by 31,104 and 12, turned three times round the circle, squared and scaled — to the neutron, 1.674927407913 (purple box), and to a free fall, 9.820927516 (blue box), which squared and carried through 864 and 360 is the spin-orbit 300,000 exactly.

Other faces of the same release are on record, each reached by setting a different speed or a different rung of the neutron family at the bottom of the same chain. The release goes as the fourth root of the speed and the square root of the neutron. **The neutron family** is the proton–neutron marriage: the proton and the neutron are weighed in married pairs, and the product of each pair is always **2.801328085343355 (2⁷·3³/(5³·π²))**. From one rung to the next the neutron steps by the branch operator, **1.000065289421850 (5^(5/2)·π^(7/2)/(2¹⁰·3))**, while the proton steps the other way. The observed neutron, 1.674927407913331, is rung −1; one step above it is rung −2, 1.675036762955435; one step below it is rung 0, the node neutron, 1.674818060010489.

```
OTHER FACES OF THE D + p RELEASE
   bottom of the chain                          face, MeV
   c_G2  299,816,259.8633855                    5.492681652451963  ( 2⁴·3^(21/4)·5²/π^(11/4) )
   c_G1  299,789,233.6830893                    5.492557867285198  ( 2⁵·3⁷·√(3/5)/π² )
         - and its free fall is g₁ 9.817477042468 (25π/8) EXACTLY
   neutron rung −2   1.675036762955435          5.493702327810377  ( 2^(1/4)·3⁶·5^(1/4)/π^(3/4) )
                     ( √5·π^(11/2)/2^(19/2) )
   neutron rung 0    1.674818060010489          5.493343670578100  ( 2^(53/4)·3⁷·5^(3/4)/π^(17/4) )
                     ( 2^(29/2)·3²/(√5·π^(3/2)) )
   the sidereal neutron 1.674640839675223       5.493053024690903  ( 2·5^(19/2)/(3^(3/2)·π⁵) )
```

The **sidereal neutron** is the sidereal rotation's own step read in minutes: the sidereal rotation 23,564.069025473 (5¹⁴/(2²·3⁸·π²)), divided by 864 and by 2π, is **434.0669056438** — Hγ times one G-bond step — and twice that over 864 is **1.004784503805 = the helical turn times the G-bond step**; divided by sixty it is **1.674640839675 (5¹⁷/(2¹⁰·3¹⁵·π³))**. The **helical turn** is one revolution of the helix, the step **1.004693930041 (5⁶/(2⁶·3⁵))**.

The face this paper adopts for the second step is 5.493522996267 MeV, the face on the observed neutron and the pure 300,000.

Step 3 — helium-3 + helium-3: helium closes, and the star shines

The third step closes helium. It creates no new seat — two seats are filled and two protons are handed back — and its release is the light of the star.

```
THE CLOSING STEP, (5/3)⁵
   He-3 + He-3 energy       12.86008230452674897 MeV   ( (5/3)⁵ )   no π, a room
   / 31104                   4.134542921980050467       ( 5⁵/(2⁷·3¹⁰) )
   / 12                      3.445452434983375389
   circumference x 4         1.653817168792020187
   x 3125/1944               2.658528113413098294
   x 2 / 9375                5.671526641947943027       ( 5⁵/(2⁷·3¹⁶) )
                             = the Stefan-Boltzmann constant, G1, x 10⁻⁸   EXACTLY
```

The **Stefan–Boltzmann constant** is the constant in the law by which a hot surface radiates: the power a star sends out from each square metre of its surface is this constant times the fourth power of its temperature. Built from the theory's own Planck value 5/(24π), its own Boltzmann value 625/(144π) and its own G1 speed of light, every power of π cancels and it is **5.671526641947943 × 10⁻⁸ (5⁵/(2⁷·3¹⁶))** — exactly where the closing step's circle route lands. **The step that closes helium carries the law by which a star shines.** The time it releases has no new seat to settle in, so it leaves as light.

```
THE SAME RELEASE, ONE REGISTER DOWN THROUGH α
   12.86008230452675  / 10368          1.240362876594015    kilojoules per mole
                      / 60             2.067271460990025    down to joules
                      / α            283.3771043004664      ( 5⁷·π²/(2⁹·3¹²) )
                      = the C-C bond's solar wavelength, 283.3771043 nm   EXACTLY
                      x 2 / 9375       6.045378225076617    ( 5²·π²/(2⁸·3¹³) )
                      / 4              1.511344556269154    hydrogen's third level
                      x 9             13.602101006422388    a ground state
                      / 31104 / 12   364.4252884522459      a Balmer limit
```

α is the fine-structure value **0.007295125222248 (3²/(5³·π²))**, the coupling of light to the atom. Through it the closing step becomes **the carbon–carbon bond's wavelength through the solar circumference, 283.3771043 nm** — the bond of carbon chains, which the theory reads as movement within the Earth's node. And from there it runs on, to hydrogen's third level, a ground state and a Balmer limit.

Carry the Balmer value of that last station up to a speed — ×4/3 to a wavelength, 485.9003846029945; ×12.337005501361698 to a mass, 5,994.555717960909; ÷2 — and the speed is **299,727,785.8980454**, the speed of light the (5/3)⁵ face carries. **Set the G1 speed of light there instead, and the same chain gives 486 exactly, then 364.5, hydrogen's G1 Balmer limit, and the G1 face of the release.** The two faces of the closing step stand exactly as far apart as the two speeds of light they carry. That is the theory's point about the scale of MeV in numbers: each speed of light carries its own gradation, and a reading is exact on the speed it was taken on.

```
THE LADDER OF THE CLOSING STEP
   face                       MeV                      reached from
   (5/3)⁵                     12.86008230452675        the Stefan-Boltzmann law; C-C bond
   G0                         12.86155929805473        the sodium line: c_G1 / G-bond step
                              ( 2¹²·3²⁷·π/5¹⁷ )
   G1                         12.86271877538556        c_G1; 486; 364.5; the 21 cm line
                              ( 2⁸·3¹⁸/(5⁷·π²) )
   G2                         12.86387835724396        the G2 Balmer limit
                              ( 2·3⁹/π⁵ )
   612 face                   12.87060159570391        the quantum base
                              ( 2¹⁷·3²³/(5¹⁵·π) )
```

The G1 face is reached by two independent roads, and they agree to every digit: the **Lyman G1 line 920.9525258744502 (2⁴·3⁶·π²/5³)** — the line the record ties to Mercury's rotation and the 21 cm line — divided by 4 and by 2π four times and multiplied by 180, is **2.659073143509512 (3⁸/(5²·π²))**, which in the circle route gives **12.86271877538556**; and hydrogen's G1 Balmer limit 364.5, run back through the ground state, the C–C bond and α, gives the same. The G0 face is the sodium line's. The Fraunhofer sodium line **588.9955242462013 (2³·3¹⁰·π⁴/5⁷)** divided by 60 is the free fall one register down, **9.816592070770022 (2·3⁹·π⁴/5⁸)** — the flow of time

read in seconds. Multiplied by 49.50355349930313 ($2^4 \cdot 3^5/(5^2 \cdot \pi)$) — the Earth's day read in degrees, at its decade — it is the wavelength 485.9561907561986, hydrogen's G1 486 one G-bond step down; multiplied by 12.337005501361698 it is a mass of 5,995.244198779998, and half of it is **299,762,209.9389999 — the G1 speed of light divided by one G-bond step**, exactly. The sodium band holds all three free falls, each times sixty: the surface free fall 9.817477042468104 (25π/8) gives **589.0486225480862 (375π/2)**, and the celestial free fall 9.818362093946918 gives **589.1017256368151 ($5^{13}/(2^5 \cdot 3^8 \cdot \pi^2)$)**. Divided by sixty and multiplied by twenty-four, each line is a sidereal rotation: the sodium line gives **235.5982096984805 ($2^4 \cdot 3^{10} \cdot \pi^4/5^8$)**, the surface line **235.6194490192345 (75π)**, and the celestial line the Earth's own, **235.6406902547260 ($5^{12}/(2^4 \cdot 3^8 \cdot \pi^2)$)** — at its decade the 23,564.06902547260 of 23 hours, 56 minutes and 4 seconds.

The face this paper adopts for the closing step is $(5/3)^5$ = 12.86008230452675 MeV, as Stephen Daubney ruled: it is the perfect fifth raised to the fifth power, with no π, and it carries the radiation law.

The whole fire

```
FORMULA N6   THE WHOLE FIRE
   4 hydrogens -> helium-4        26.73191888962368763 MeV   ( 2⁷·3⁸/π  =  6⁸/(2π) )
   / 31104                         8.594366926962348132
   / 360 x 2π                      0.15  ->  1,500          EXACTLY
   x 2                           300,000                    the pure spin-orbit

   WHAT EACH PART IS
   6⁸ = 1,679,616 = 2⁸·3⁸, read once round a circle (/2π)
   31104 the gear to a circumference;  360 and 2π the orbit in degrees and radians
```

The total release of the God reaction is six to the eighth power read once around a circle, and it comes down to exactly the spin-orbit speed. The whole fire is one turn of time.

Step 4 — helium-3 + helium-4: the anti-Earth seat

The side branch begins here. Helium-3 and helium-4 make beryllium-7, whose four electrons are Mercury, the Venus seat, the Earth and the anti-Earth.

```
THE SIDE BRANCH OPENS, FROM THE GOD ELEMENT
   hydrogen                  1.007860451037484      ( 5³/(2²·π³) )
   x 9375 / 2π           1,503.805994338526         joules  ( 3·5⁸/(2³·π⁴) )
   x 2                   3,007.611988677051         a spin-orbit
   x Planck 6.6314559621623   1.994484645418326     a dimensional mass of the Sun
   x 2 / 2π              6,348.641804784255         a radius
   / 4                       1.587160451196063684 MeV   ( 5⁹/(2⁷·π⁶) )  π −6, a room

THE EARLIER FACE, 5/π, ONE GEAR FROM THE EARTH
   5/π  =  1.591549430918953     x 4  =  20/π  =  the Moho, 6,366.197723676   EXACTLY
```

Two faces stand for this step. The face read straight from the God element through 9375, Planck and a dimensional mass of the Sun is **1.587160451196064 MeV**; on hydrogen's G1 weight the same route gives 1.587017380621664 ($3^9/(2^3 \cdot 5 \cdot \pi^3)$), one G-bond step lower. And the older face, **5/π**, is one gear from the Earth: four times it is the Moho. **The step that locks the anti-Earth seat releases the Earth's discontinuity.** The paper adopts **1.587160451196064 MeV**, from the God element; 5/π stays on record as the seat's Moho face.

Step 5 — beryllium-7 + an electron: the anti-Earth taken in

Beryllium-7 captures an electron, and the electron it takes is the anti-Earth, the second partner of the 2s pair. Lithium-7 is left with Mercury, the Venus seat and the Earth. The face of this step sits on the neutron's free fall.

```
THE CAPTURE STEP, ON THE NEUTRON'S FREE FALL
   face                       0.8618424973044408402 MeV  ( 2^(19/2)·3¹⁰·5⁴/π³ )
   / 31104 / 2 x 2π / 864      1.007506350440782
   x 864 / 2                 435.2427433904180
   x 16 x 2π             4,375.537296523535
   / 12                    364.6281080436280         a Balmer value
   x 4/3                   486.1708107248373         a wavelength
   / the veil / 864          9.820927516479827       THE NEUTRON'S FREE FALL  ( 1000·√2/144 )
                             = √(300,000 / 360 / 864)
```

The capture step is a door on the two, as the neutron is. The neutron at the bottom is the observed neutron, the same one the second step reaches. On the higher rung of the neutron family, 1.675036762955, the same chain gives 0.8618987665028159 ($3^9 \cdot 5$^(13/2)·√π/√2). **The paper adopts 0.8618424973044 MeV**, on the observed neutron, so that the chain runs on one neutron throughout.

Step 6 — lithium-7 + p: lithium's own weight, and the Earth's year

```
THE LITHIUM STEP
   face                     17.35047800135332706 MeV  ( 5¹¹/(2¹²·3⁷·π) )
   x 4                       6.940191200541330824     LITHIUM'S WEIGHT  ( 5¹¹/(2¹⁰·3⁷·π) )
   x π                       2.180325369012917      hydrogen's grip in joules ( 5¹¹/(2¹⁰·3⁷) )
   x 2                       4.360650738025834
   x 16 x 2π / 12          365.3170219587432436     THE G2 YEAR  EXACTLY
DOWN THE HELICAL TURN
   436.0650738026 / r       434.0277777777778        Hγ = 432 x r  ( 5⁵/(2³·3²) )
                  / r       432                      EXACTLY  -  half the day 864
```

The release of the step that splits lithium is lithium's own weight divided by four. It carries hydrogen's ground state in joules, the G2 year — the Earth's orbit, because lithium's electron, $2s^1$, is the Earth — and, down the helical turn, Hγ and 432, half the day. On the G1 year the same route gives 17.34891398628989 ($45 \cdot \pi^2/256$), one G-bond step lower. Stephen Daubney ruled the G2 face: "*it also links to lithium's atomic weight, and seeing that the calculation is a reaction including lithium, it seems pretty clear that that should be the MeV value*." **The paper adopts 17.35047800135333 MeV.**

Step 7 — beryllium-7 + p: the first 2p seat, through boron and Venus

```
THE BORON-8 STEP, FROM 32π
   32π                       100.5309649148734            ( 2⁵·π )
   x 4 / 2π                   64                           EXACTLY
   32π x 864 / 2             434.2937684322530            ( 13824·π )
   / 2                       217.1468842161265            ( 6912·π )
   x 2π                        0.1364374112406592935 MeV  ( 2⁹·3³·π² )  π +2, a room
   217.1468842 / 2           108.5734421080633            ( 3456·π )   BORON'S ROUTE
   1 / that                    9.210355503003202
   x 4                       368.4142201201281            MERCURY'S G2 NODE  ( 10⁶/(864·π) )
```

The step that makes boron passes through boron's own record value — the record reaches boron at 10.85734421 by two independent roads — and closes on **Mercury's G2 node, 368.4142201201281 ($10^6/(864 \cdot \pi)$)**. And the station 108.5734421 is Venus: the record's Venus node is 9216 ($2^{10} \cdot 3^2$), and inverted it gives Venus's distance, **108,506,944.444 km ($10^{12}/9216$)**. **9.210355503 is 9216 divided by the 612 step, exactly**, so 108.5734421 is Venus's 108.5069444 times the 612 step. The boron step runs through Mercury inverted and brought round to the Venus seat. Set on Venus's node 9216 itself, the same chain gives 0.1363538478120570 ($5^8 \cdot \pi/3^2$). **The paper adopts the 32π face, 0.1364374112406593 MeV**, which runs through boron itself.

Step 8 — boron-8 to beryllium-8 + a positron: the hydrogen atom's mass

```
THE BORON-8 POSITRON STEP
   hydrogen 1.007860451037 x the Dalton 1.660412720511  =  1.673464313402134
                                                         the hydrogen atom's mass
   x 6 x 4 / 2π x 9375 / 4    14,981.63161307818
   / 864                          17.33985140402567
   x 10368                        17.97795793569381961 MeV  ( 5²⁰/(2¹³·3⁸·π²) )
```

The **Dalton** is the mass unit, $1.660412720511 \times 10^{-27}$ kg ($5^{12} \cdot \pi^2/(2^{13} \cdot 3^{11})$). The step at which the positron meets the 2p electron boron had just gained is the hydrogen atom's own mass, carried through 9375, 864 and 10,368. Two links tie it to the lithium step. **Its station 17.33985140402567 is the lithium face divided by the 612 step, exactly.** And the lithium face divided by this face is **3072π ($2^{10} \cdot 3 \cdot \pi$)**, whose square root is a free fall, **9.823936396286**, and which, times 864 and 36, is **300,183,852.74 — the pure spin-orbit times the 612 step** — and four-thirds of that is **helium-4, 4.002451369872, exactly.** The two steps that end in helium divide into the spin-orbit carried one helium step, and four-thirds of it is helium.

Step 9 — beryllium-8 to two helium-4

```
THE BERYLLIUM-8 SPLIT
   FROM THE G2 SPIN-ORBIT
   c_G2  299,816,259.8633855  ( 5¹⁶/(2·3⁴·π) )  x 1944/3125   186,509,698.9358148
   / (24 x 2π x 2π x 2)                  9.842387217162930    a free fall
   / 4                                   2.460596804290733    a wavelength
   x 12 x 31104                          0.09184128360079073 MeV  ( 2³·3⁶·5¹¹/π³ )
   ON c_G1                               0.0918330048          ( 2⁷·3¹⁵·5 )  no π
   FROM THE HELIUM LINE
   helium D3, 587.5538877802527  ( 5²⁵/(2³³·3¹⁰) )  / 64   0.09180529496566448
```

The step that turns beryllium-8 into two heliums has three faces: the G2 spin-orbit, the G1 spin-orbit (a terminating decimal with no π), and the helium D3 line of sunlight — locked as sodium D2 divided by helium-per-nucleon to the fourth — read down by 64. **The paper adopts the G2 face, 0.09184128360079 MeV**, keeping the chain on G2.

Step 10 — hep: Planck over twice the neutron

```
THE RAREST BRANCH
   the observed neutron      1.674927407913331     invert   0.5970408002612044
   / 2                       0.2985204001306022    a spin-orbit
   x Planck                  6.631455962162306     ( 5/(24·π) )
   =                         19.79624887273159222 MeV  ( 5³/(2^(9/2)·3²·π³) )
   on neutron rung −2        19.79495647146802     ( 2^(11/2)·√5/(3·π^(13/2)) )
```

The rarest branch of all — three electrons in, the positron meeting the Earth electron — is **Planck over twice the neutron.** It is a door, with a half power on the two. Its first station, the inverted neutron **0.5970408002612044 (√2/(2400·π²))**, is the gap between the two yellow lines of sodium, the doublet the companion paper reads as the neutron: the rarest branch of the fire passes through the space between sodium's two yellow lines in sunlight. **The paper adopts 19.79624887273159 MeV**, on the observed neutron.

PART SIX — THE CHAIN, AS RULED

Every step of the chain now has its face. These are the values the theory holds for the releases of the God reaction, as Stephen Daubney ruled them in this work.

```
THE RELEASES OF THE CHAIN, ON THE LATTICE (MeV)
   step                          face                    address
   p + p  (and pep)               1.443653754564984636    3²·5³/(2³·π⁴)           G2
   deuterium + p                  5.493522996267268513    2^(25/4)·3^(13/2)/π^(5/2)
   helium-3 + helium-3           12.86008230452674897     (5/3)⁵
   THE WHOLE FIRE                26.73191888962368763     2⁷·3⁸/π  =  6⁸/(2π)
   helium-3 + helium-4            1.587160451196063684    5⁹/(2⁷·π⁶)
   beryllium-7 + electron         0.8618424973044408402   2^(19/2)·3¹⁰·5⁴/π³
   lithium-7 + p                 17.35047800135332706     5¹¹/(2¹²·3⁷·π)  lithium/4
   beryllium-7 + p                0.1364374112406592935   2⁹·3³·π²  =  13824·π²
   boron-8 -> beryllium-8 + e⁺   17.97795793569381961     5²⁰/(2¹³·3⁸·π²)
   beryllium-8 -> 2 helium-4      0.09184128360079073287  2³·3⁶·5¹¹/π³           G2
   hep                           19.79624887273159222     5³/(2^(9/2)·3²·π³)
```

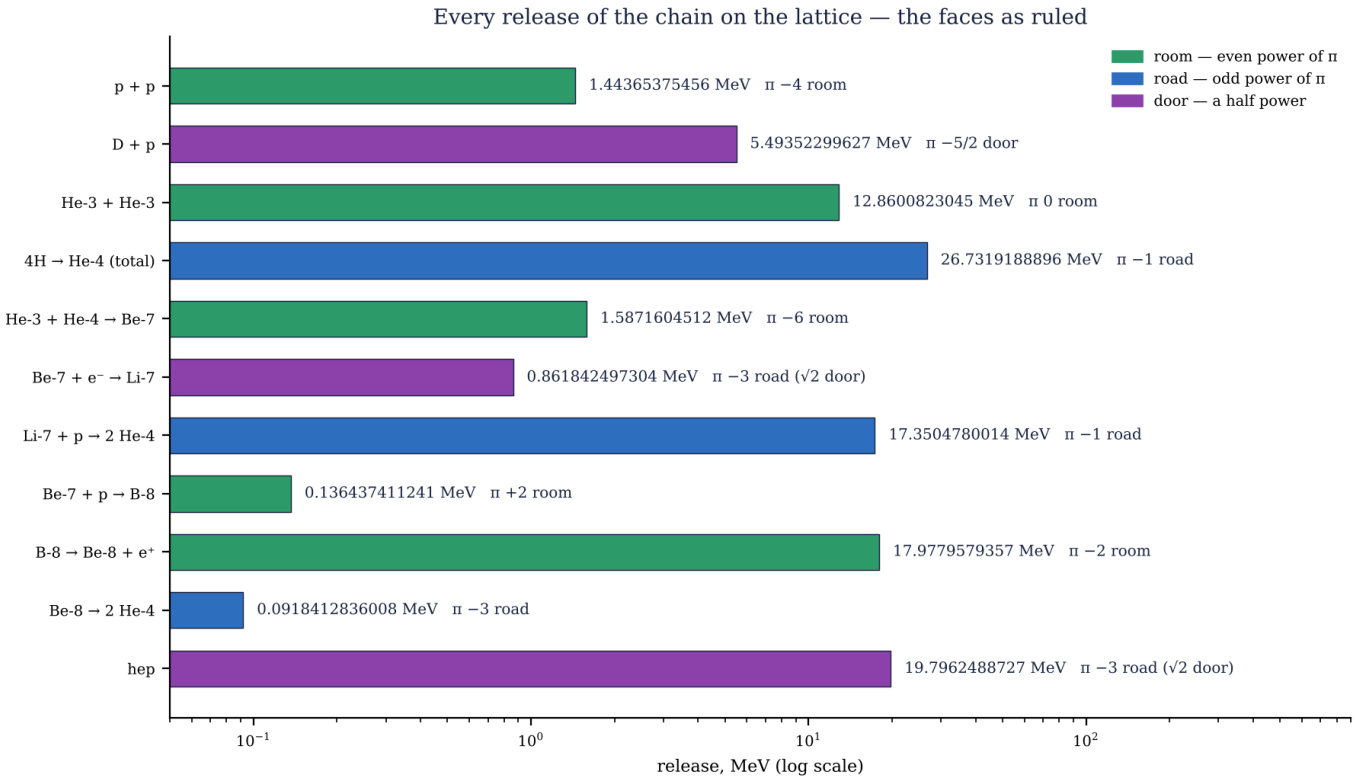


Figure 8 — **Every release of the chain on the lattice.** *What the picture shows:* the eleven ruled releases as bars on a scale that rises tenfold at each mark, each labelled with its value and its power of π. Green bars are rooms (an even power of π), blue bars roads (an odd power), purple bars doors (a half power somewhere in the address). The shortest bar is the beryllium-8 split, the longest the whole fire.

Read down the table and two things stand out. **The chain runs on the G2 faces and on one neutron.** Where a step offered a G1 and a G2 face, the G2 face is the one whose route lands on the step's own seat; where a step's face runs through the neutron, it is the same neutron every time — the observed neutron, 1.674927407913331 ($\sqrt{2}\cdot 3\cdot\pi^2/5^2$), the one the second step reaches with the pure spin-orbit 300,000. And **the doors sit where the neutron sits**: the second step, the capture step and hep each carry a half power, because each runs through the neutron, and the neutron carries its root on the two.

PART SEVEN — WHY THESE AMOUNTS: EACH RELEASE IS THE TIME OF ITS SEAT

The releases are not random amounts. In the theory every release is time, and time is what gives matter its distance from the Sun, its rotation and its orbit. So the question Stephen Daubney put in this work is the right one: why does each step give out exactly the amount it does?

The proposition

> **P-FUSE-2. Each step of the chain releases exactly the time needed to lay down the node its electrons create — the node's position, its rotation and its orbit, read at that node's register. The amount is fixed because an address is fixed. A step that creates no new seat sends its time out as propagating time — light.**

Why it must be exact

Stephen Daubney's point from chemistry carries the argument. When things come together and bond, energy is released, and the instinct is to treat that energy as a throwaway, the part the bond did not need. But **exactly the energy a bond releases is the energy that has to be put back to break it.** Science's own measurement shows it: light carrying exactly the deuteron's binding is what it takes to split it again. So the released time is not spare. **It**

is the seat's own time — the time that holds the node at its address. Return it and the seat unlocks. That is why the release can only be the seat's address and nothing else, and it is the law dΣT = 0 at the bond: the time that goes out on bonding is the time that comes back on breaking.

The seats, step by step

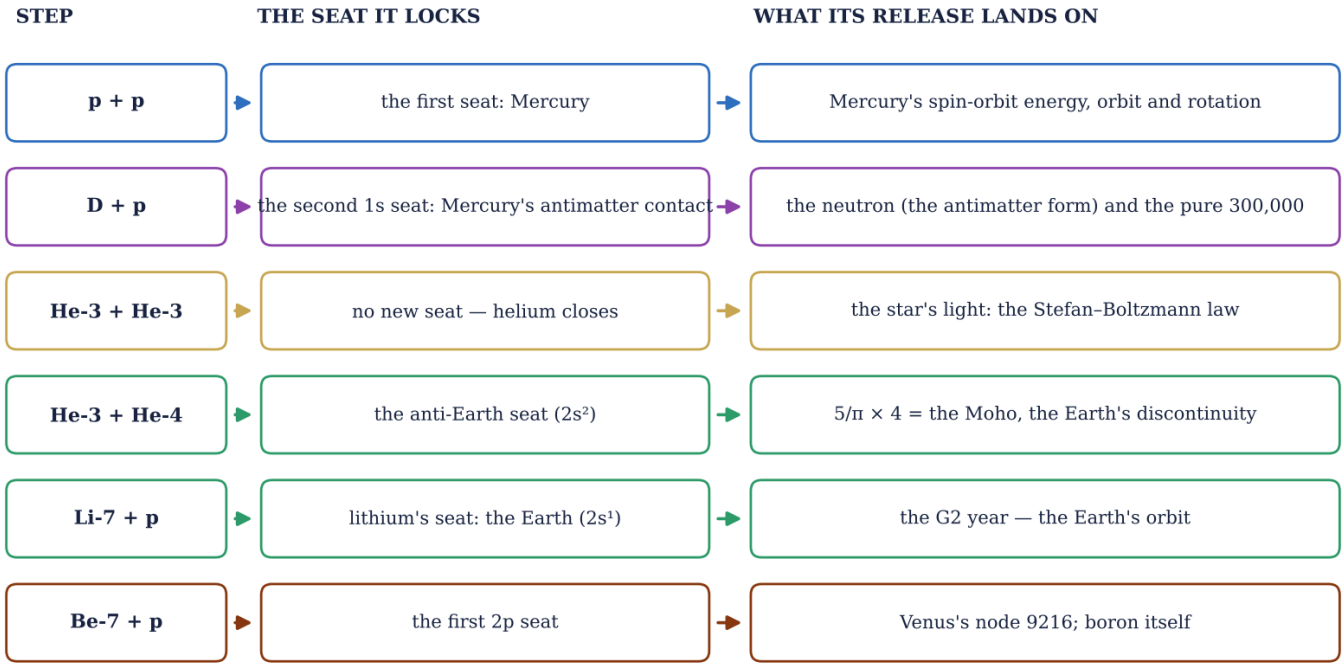


Figure 9 — Each release is its seat's own time. *What the picture shows:* six steps of the chain, each joined to the seat it locks and to what its release lands on. The first step locks Mercury, and its release is Mercury's spin-orbit, orbit and rotation. The second fills the antimatter seat of the first shell, and its release is the neutron and the pure 300,000. The closing step makes no new seat, and its release is the star's light. The side branch locks the anti-Earth (the Moho), the Earth (the year) and the first 2p seat (Venus's node, and boron).

Five of the seats can be checked against the routes of Part Five, and all five land where the proposition says.

- **The first seat, Mercury.** The first step's G2 face is Mercury's spin-orbital energy, and through the hinge it is Mercury's orbit — one gear from the release.
- **The antimatter seat of the first shell.** Its release runs to the neutron, the antimatter form, and to the speed of time. Run through the same gears it does not land on Venus's orbit or rotation — which is exactly what the book says it should not do, because "*the electrons are never Venus*": the seat is Mercury's antimatter contact, so its release is the neutron's.
- **The anti-Earth seat.** The face 5/π, four times over, is the Moho — the Earth's discontinuity — in one gear.
- **The Earth seat.** Lithium's release, through one route, is the G2 year.
- **The first 2p seat.** The boron step runs through Venus's node and boron, in two gears.

The closing step makes no seat, and its release is the Stefan–Boltzmann law: the time leaves as the star's light. The whole fire, all seats and all light together, is one turn at the spin-orbit speed.

Three of the five land one gear from the release — the first step on Mercury, lithium on the year, 5/π on the Moho — and each landing is exact.

Two protons are two suns

There is a question underneath the first step, and Stephen Daubney put it plainly: by the dimensional scaling of the theory, two protons coming together is two suns coming together. How can two suns come together?

The theory's answer is in its own drawings. He drew the axis through the Sun's poles running down to a second, antimatter sun; the book has the Sun's northern hemisphere sending time out along the matter strand, which feeds

our solar system, and its southern hemisphere sending it along the antimatter strand, which feeds the mirror system. **The two protons of the first step are the Sun and its antimatter self.** Two matter suns cannot share one address, and that is why two protons alone never bind. One must turn to the antimatter form: the proton becomes the neutron, throwing off anti-Mercury, the positron. **The deuteron — one proton and one neutron — is the two suns locked: the base pair of the double helix at ground state, with Mercury outside.**

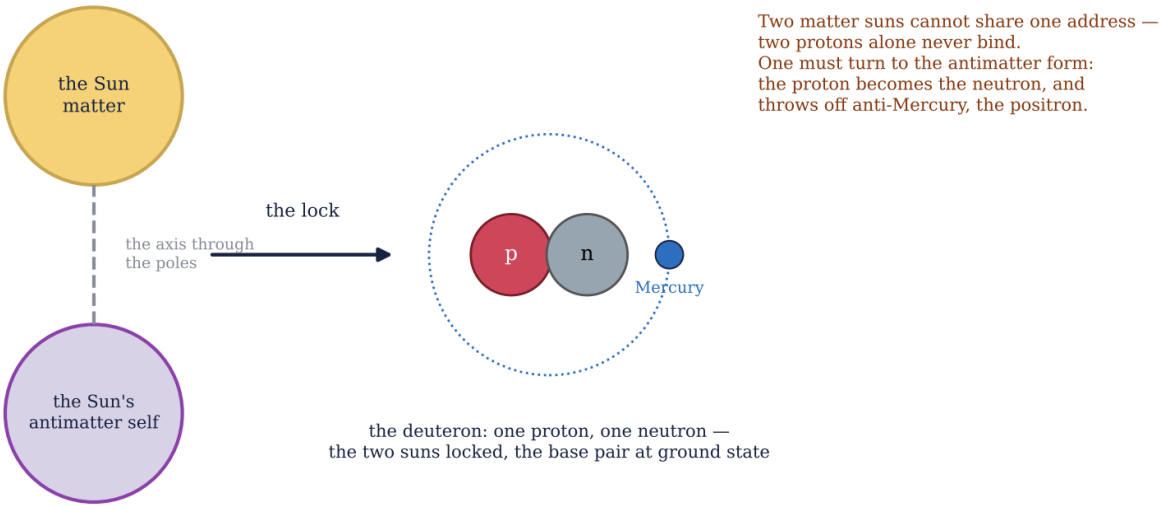


Figure 10 — **Two protons are two suns.** *What the picture shows:* on the left the Sun (gold) and its antimatter self (lilac) on the axis through the poles. The arrow is the lock. On the right the deuteron — a proton (red) and a neutron (grey) — with one electron, Mercury, on its dotted orbit. Two matter suns cannot share one address, so one turns to the antimatter form.

And what the lock builds is the first helical turn. The record carries it: **hydrogen × helium = 864 × r = 868.0555555556**, the day advanced by one helical turn. The first shell, 1s, is the ground state of the DNA helix; the second, 2s with nitrogen and oxygen, is the first helical turn. **The reaction is the ground state — two suns on two strands — locking into the first turn.**

One proton at a time, as time flows

The theory rests on one proton, one neutron and one electron. As time flows — as the Sun moves on its helical turn and along its space-dimensional link with its nodes — new protons are created, energy-wise: one becomes two, two become three, and so on, each made when enough time has flowed for the next to be created. The record's hydrogen ladder counts that build-up exactly.

```
THE BUILD-UP, ONE PROTON PER FORTIETH OF A TURN
   n hydrogens read as a wavelength and carried to a rung:
   rung  =  n x 21.70138888889   ( 3125/144 )  =  (n / 40) x 868.0555555556 ( 864 x r )

   helium   n = 4     86.80555555556     one tenth of the first helical turn
   neon     n = 20   434.02777777778     half the turn  =  Hγ  =  432 x r
   argon    n = 40   868.05555555556     the whole turn =  864 x r
```

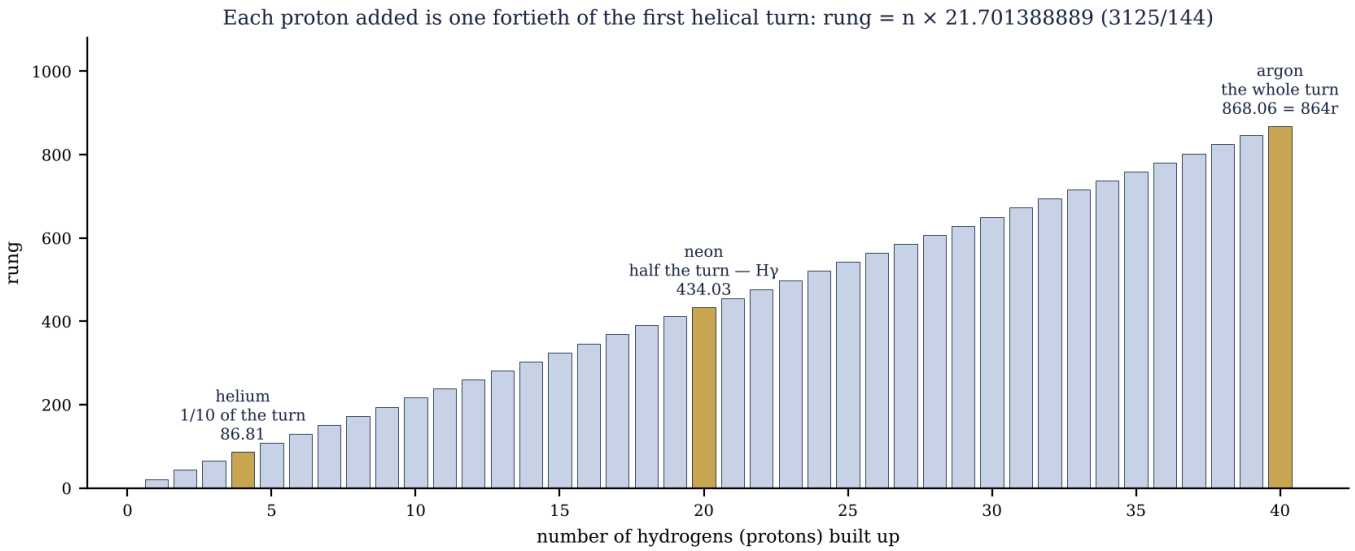


Figure 11 — The build-up. *What the picture shows:* the rung reached by n hydrogens, for n from 1 to 40, rising in equal steps of 21.701388889. The gold bars are the noble gases that close the first three rows: helium at a tenth of the first helical turn, neon at half of it — which is the violet hydrogen line Hγ — and argon at the whole turn.

Each new proton is one fortieth of the first helical turn. The count of protons is the time that has flowed along the turn, and the noble gases close where the build-up reaches a tenth, a half and the whole of it.

The same build-up appears at the Earth's register in carbon. The Earth's day, read in degrees, is **495.0355349930 (7776/(5π))**; squared it is **24.506018090584** — the tide, 24 hours and 50.6 minutes; and times 2π it is **the carbon–carbon bond, 153.9758528042324 pm (2·7776²/(25·π))**. Stephen Daubney's proposition from this work: each rotation of the Earth can create a carbon, and each carbon–carbon bond in a chain is one Earth day read in degrees — and, since 2π completes the orbit in radians as 360 completes it in degrees, one Earth year read in radians. The day and the year are two faces of one bond, and both are read.

PART EIGHT — ONE REACTION, SIX DOMAINS

The largest claim of the first revision stands unchanged. **Every domain the theory has unified falls out of the hydrogen that goes into the fire.** Take the hydrogen of the reaction — a quarter of the four hydrogens — and step from it, one exact operation at a time.

```
FROM THE FUEL OF THE FIRE
   hydrogen in the reaction   1.007860451037484   ( 5³/(2²·π³) )   the table begins here
   x 27/2                    13.606116089006034 eV ( 3³·5³/(2³·π³) ) hydrogen's grip
   / 0.0279936  ( 3⁷/5⁷ )   486.043813193231 nm  ( 5¹⁰/(2³·3⁴·π³) ) Fraunhofer F line
   x 3/4                     364.532859894923 nm  ( 5¹⁰/(2⁵·3³·π³) ) the spectrum's limit
   x π⁴/25                1,420.352581375594 MHz ( 5⁸·π/864 )        the 21 cm line

FROM THE TWO PARTNERS OF THE FIRE
   hydrogen x helium  =  868.055555556  =  864 x 1.004693930041     the helix, one turn up
   the grip in joules  =  864 x r² / 4                               the helix, turn two
   helium / 4  =  1.000612842468  ( 2⁹·3⁵·π/5⁸ )                    the ruler of the table
```

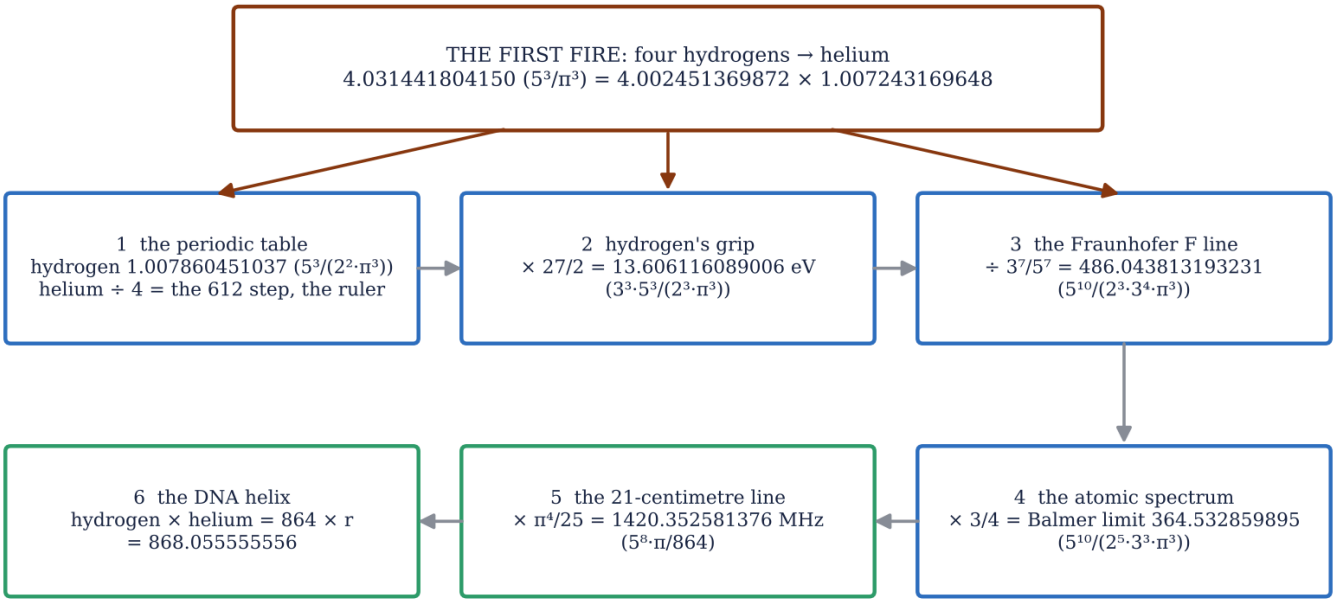


Figure 12 — One reaction, six domains. *What the picture shows:* at the top, the first fire — four hydrogens becoming helium, written as the exact product. Below, the six domains, each in its own box and each reached by one exact step: the periodic table; hydrogen's grip on its electron, × 27/2; the Fraunhofer F line of sunlight, ÷ $3^7/5^7$; the limit of the hydrogen spectrum, × 3/4; the radio line of cold hydrogen, × $\pi^4/25$; and the helix of DNA, because hydrogen times helium is the day times one helical turn.

The periodic table begins with the hydrogen that goes into the fire, and the second entry is what comes out, helium. Helium divided by its four nucleons is **the 612 step** — helium divided by four, helium per nucleon — the ruler every element above it is measured with, and, as Part Five showed, the step that links the lithium and boron releases and carries 364.5 to the quantum base. **Hydrogen's grip** is the hydrogen of the fire times 27/2. **The Fraunhofer F line** is the grip divided by $3^7/5^7$, a gear with no π, because the grip and the line never leave the register. **The atomic spectrum's limit** is three quarters of the line. **The twenty-one centimetre line** is the limit carried by $\pi^4/25$, and its lattice form is $5^8 \cdot \pi$ divided by 864 — and **864 is the day**, the ground state of the DNA helix. **The helix of DNA** meets the two partners of the fire directly: hydrogen times helium is the day advanced by exactly one helical turn. So chemistry's table, atomic physics' ionisation, spectroscopy's lines, astrophysics' dark lines in sunlight, radio astronomy's twenty-one centimetres and biology's double helix are one reaction read on six clocks.

PART NINE — THE STEPS MULTIPLY INTO THE LARGEST OBJECTS

Time sometimes hides things in the spaces between levels, and Stephen Daubney asked the obvious question: what do the releases give when they are subtracted, added, multiplied and divided? All fifty-five pairs of the eleven ruled faces were put through all four.

Subtraction and addition give nothing. None of the 110 differences and sums is a lattice value. The steps do not combine by adding or subtracting, which is what the law of fusion already said: the lattice is closed under multiplication and division, and the fire's own law is a product.

Multiplication gives the theory's largest objects.

```
PRODUCTS OF THE STEPS
   boron-8 step  x  beryllium-8 split
      0.1364374112406593 x 0.09184128360079073  =  125.3058697951110 GeV
      ( 3⁹/(2·5²·π) )   THE HIGGS, FACE 1  -  the face the book leads with

   the whole fire  x  the boron-8 step
      26.73191888962369 x 0.1364374112406593    =  364.7233810795535
      ( 2⁵·3¹¹·π/5¹¹ )  THE QUANTUM BASE  -  the value that resolved the quantum problem
```

The two boron steps make the Higgs, and the whole fire and the boron step make the quantum base — the base of the discontinuity read through the veil.

The radius of the hydrogen atom, on G2

Hydrogen's values in this paper are read on the G2 register, and the radius of the hydrogen atom on that register is **52.88496871297024 picometres (π²/(2¹³·3⁶·5⁵))**. Stephen Daubney's chain carries it to the Earth.

```
THE RADIUS OF THE HYDROGEN ATOM, ON G2
   Bohr radius, G2         52.88496871297024 pm    ( π²/(2¹³·3⁶·5⁵) )
   x 9375                495,796.5816840960
   / the veil              8,653.282770520488
   / 864                      10.01537357699131
   x 4 / 2π                6,375.984846760494 km  ( π²/(2¹⁹·3¹⁰·5) )   the Earth's radius, G2
   x the veil                365.3170219587432    ( π/(2¹⁷·3⁸) )       the G2 year, in days
```

The atom's radius and the Earth's year are one value on one register. The radius of the hydrogen atom, carried through the gear 9375, the day and the circle, is the Earth's radius on G2, 6,375.984846760494 km; read through the veil, that radius is the G2 year, 365.3170219587432 days — the same year the lithium step carries. The size of the fire's fuel, the hydrogen atom, and the orbit of the planet that lithium's electron seats are one address.

PART TEN — THE FIRE CLIMBS, AND THE SPARK OF EVERYTHING

After helium the fire climbs. Three helium nuclei fuse into carbon through a short-lived gateway, the excited state of carbon that Fred Hoyle predicted had to exist before it was found. The releases of the cascade sort themselves by their power of π, and the sorting says what each one is.

```
THE CASCADE, SORTED BY π-DEGREE
   π⁰   built     helium-3 + helium-3 -> helium-4    12.86008230452675 MeV  ( (5/3)⁵ )
   π¹   spent     the coin, the proton's own energy   3.183098861838    ( 10/π )
   π²   gateway   the Hoyle state                     7.654241360332 MeV ( 2¹²·5√5·π²/3¹⁰ )
   √    living    triple-alpha -> carbon              7.274761123318 MeV ( 1250√2/243 )
```

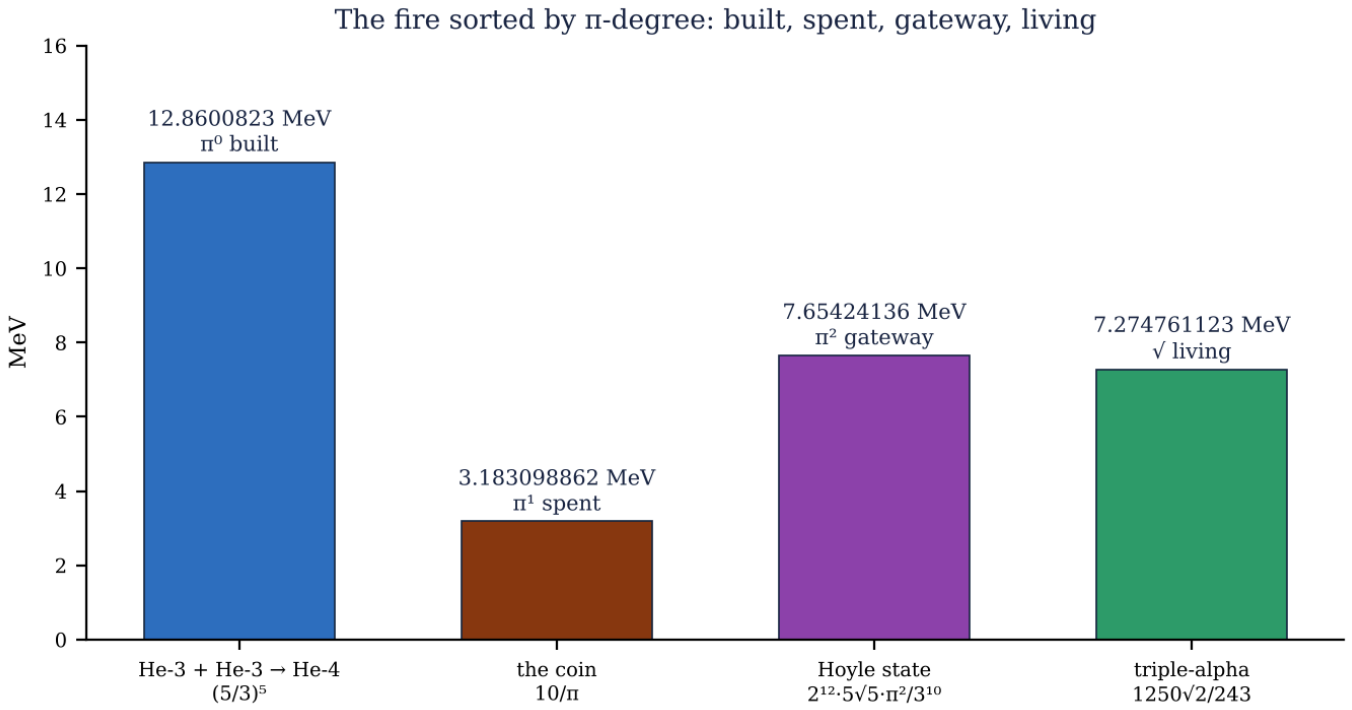


Figure 13 — The fire sorted. *What the picture shows:* four releases of the stellar cascade as bars, each labelled with its value and its class. The blue bar, with no π, is what the fire builds — the closing step of the chain. The brown bar is the coin, 10/π, the energy the fire spends. The purple bar is the gateway to carbon, carrying π². The green bar is carbon, the element of life, carrying a square root.

10/π is the coin; the cascade is the change. The π⁰ class is what is built; the π¹ class is what is spent; the π² class is the gateway; and the class where a root enters is carbon. A half power is a door, a road between registers, and carbon is where the cascade crosses one. **That is why carbon, and not another element, is the one life is built from** — and why the second step of the chain, which runs through the neutron, is a door too.

The first fusion mints two things at once, and they are the two things the rest of the universe is made of. It mints **the first closed node**, helium-4, the first configuration the field can hold without further change — the first element that holds the antimatter turn beside the matter one. And it mints **the first light**, which is not a by-product but the reaction's own substance: the seats that became flow, propagating outward as time. From there the account is continuous. The node climbs an address map one proton at a time, a fortieth of a turn each; the address map is the helix, the same structure that appears at the molecular register as DNA; the electrons it lays down are the planets; and **the periodic table, the planets, the double helix and life are one staircase, and this reaction is the bottom step.**

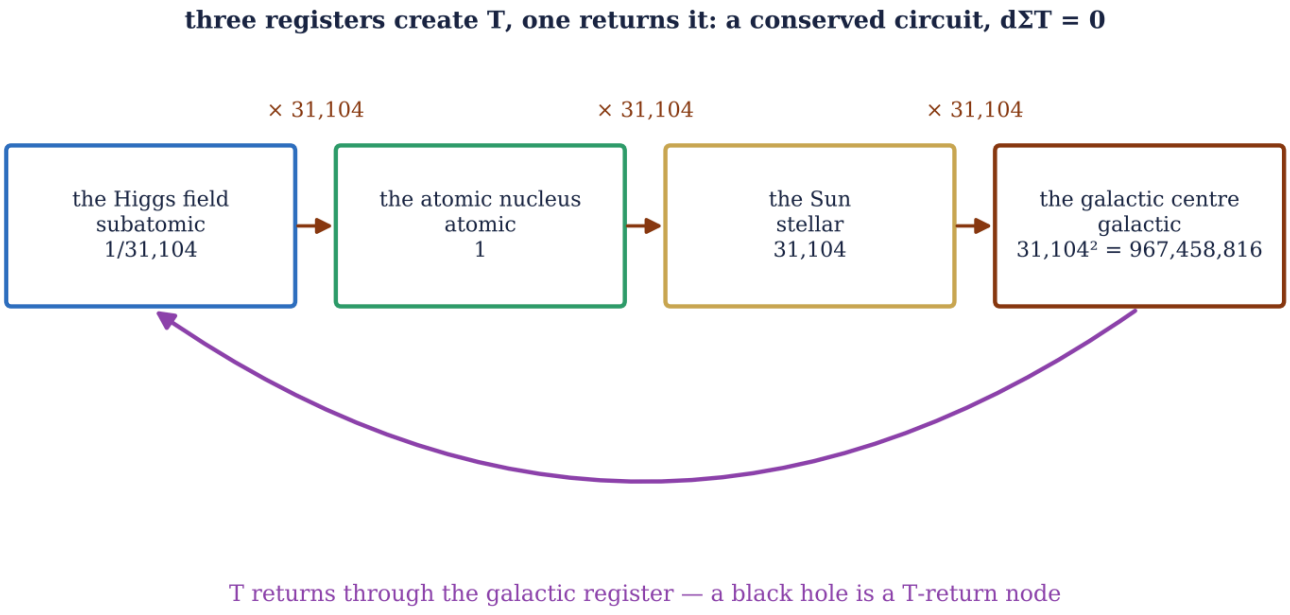


Figure 14 — The fire in the circuit. *What the picture shows:* the four registers of the circuit — the Higgs field, the nucleus, the Sun, the galactic centre — joined by the gear, × 31,104, with the purple arc running back from the galactic centre. The fire of this paper burns in the third box, the Sun; the T it makes goes round to the fourth and is dealt out again. Nothing the fire makes is ever lost.

WHAT THIS REVISION CHANGES

- **Free fall** is set out as the flow of time — not a pull — with the calculation that joins the two — the free fall times the 24-hour day is the Earth's sidereal rotation — and with the place the flow can be seen: sodium's line is the free fall times sixty, and the sodium band holds all three free falls (the terms; Step 3).
- **Rees's 0.007** is carried as the factor of the law of fusion, hydrogen's second face (Part Four).
- **The rarest branch** is joined to the sodium doublet: its first station is the gap between the two yellow lines (Step 10).
- **The electron comes from hydrogen:** the electron node is hydrogen one helical turn down (Part Four); the G2 electron is hydrogen's G1 weight carried up, by a step whose inverse, $12^{10} \div \pi$, is helium's radius through the veil and the day (Part Three).
- **Hydrogen's values are read on G2:** its grip is the G2 ground state the first step lands on (the terms); the light of each positron's meeting is two G2 electrons (Part Three); and the radius of the hydrogen atom is its G2 value, which carries to the Earth's G2 radius and the G2 year (Part Nine).
- **Every figure the theory gives is on the lattice,** and every worked chain is carried at full precision, so that each station can be rebuilt from the numbers printed beside it.
- **Revision 2 stands beneath it:** the second electron is Mercury's antimatter contact; nothing is destroyed; the side branches are given in full; the releases are those of the table in Part Six.

WHAT STANDS

Every release of the chain from hydrogen to boron has a lattice face. Each release is a ladder of faces one G-bond step apart. The first step is Mercury's. The second runs to the neutron and the pure spin-orbit. The closing step is the Stefan–Boltzmann law. The lithium step is lithium's own weight over four and carries the G2 year. The whole fire is $6^8 \div 2\pi$, the spin-orbit 300,000. The law of fusion is a product, and the mass defect is hydrogen read one register up. The electron comes from hydrogen, by a step that helium carries. The steps multiply into the Higgs and the quantum base, and the radius of the hydrogen atom on G2 is the Earth's G2 year. And the free fall that runs through the routes is the flow of time, written in the sodium line.

PROPOSITIONS

- **P-FUSE-1.** Four hydrogens equal helium times hydrogen's second face; the mass defect is hydrogen read one register up, and the divisor is the electron node.
- **P-FUSE-2.** Each step of the chain releases exactly the time needed to lay down the node its electrons create; a step that creates no seat sends its time out as light.
- **P-FUSE-3.** Every release of the chain is a ladder of lattice faces one G-bond step apart; science reads one point of that ladder.
- **P-FUSE-4.** The release adopted for a step is the face whose route lands on the step's own concept — its seat, its element, the neutron, the speed of time — not the face nearest a laboratory figure.
- **P-FUSE-5.** Two protons are the Sun and its antimatter self; the deuteron is the two locked, the base pair of the helix at ground state.
- **P-FUSE-6.** Each proton built up is one fortieth of the first helical turn; the noble gases close at a tenth, a half and the whole turn.
- **P-FUSE-7.** The whole fire is $6^8 \div 2\pi$, one turn at the spin-orbit speed.
- **P-FUSE-8.** The steps multiply, and do not add: their products are the Higgs and the quantum base.
- **P-FUSE-9.** The radius of the hydrogen atom on G2, 52.88496871297024 pm ($\pi^2/(2^{13}\cdot3^6\cdot5^5)$), carried through the gear 9375, the day and the circle, is the Earth's G2 radius, and through the veil the G2 year.
- **P-FUSE-10.** The electron's energy comes from hydrogen's atomic weight: hydrogen's G1 weight, 1.0077696 ($2^2\cdot3^9/5^7$), times the step 507,384.7527204767 ($5^{13}\cdot\pi/(2^7\cdot3^{10})$) is the G2 electron, 511,326.9292952137 eV ($5^9\cdot\pi/12$); and the inverse of the step, $12^{10} \div \pi$, is helium's radius, 6,370.0992 km ($2^{10}\cdot3^5/5^8$), read through the veil and the day, and the east wall of the Great Pyramid, 230.4 m (2,304 at its decade), carried through the circle, the day and the mile.

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APPENDIX — EVERY NUMBER, REBUILT

Every value in this paper can be rebuilt with any calculator that keeps enough digits, from twos, threes, fives and π. The script N2_calc.py, run at forty-four digits, asserts every route of Part Five and every product of Part Nine and stops if any station fails; it passed in full for this revision, with the free falls, the sodium lines, the G2 grip and electron, and the G2 radius of the hydrogen atom of this revision added.

```
THE OBJECTS, NUMBER FIRST
   G-bond step       1.000090150603356201    5¹⁰/(2⁴·3⁹·π³)
   helical turn r    1.004693930041152263    5⁶/(2⁶·3⁵)
   612 step          1.000612842467910952    2⁹·3⁵·π/5⁸   (helium / 4)
   veil             57.29577951308232088     180/π
   hydrogen          1.007860451037484037    5³/(2²·π³)
   hydrogen, G1      1.0077696               2²·3⁹/5⁷
   helium-4          4.002451369871643807    2¹¹·3⁵·π/5⁸
   lithium           6.940191200541330824    5¹¹/(2¹⁰·3⁷·π)
   the Dalton        1.660412720510545360    5¹²·π²/(2¹³·3¹¹)   x 10⁻²⁷ kg
   neutron           1.674927407913331088    √2·3·π²/5²         x 10⁻²⁷ kg
   free fall, G0     9.816592070770022257    2·3⁹·π⁴/5⁸         sodium's line / 60
   free fall, G1     9.817477042468103870    25π/8
   free fall, G2     9.818362093946918018    5¹²/(2⁷·3⁹·π²)     x 2400 = the sidereal rotation
   sidereal day 23,564.06902547260324        5¹⁴/(2²·3⁸·π²)     23 h 56 min 4 s
   electron    510,900.9792795224988         2¹³·3⁵·5²/π⁴       the electron node, eV
   electron, G2  511,326.9292952137          5⁹·π/12            eV; x α²/2 = the G2 grip
   Bohr, G2         52.88496871297024        π²/(2¹³·3⁶·5⁵)     pm
   G2 year         365.3170219587432         π/(2¹⁷·3⁸)         days
   helium radius  6,370.0992                 2¹⁰·3⁵/5⁸          km; x 2π = helium
   H -> e step  507,384.7527204767           5¹³·π/(2⁷·3¹⁰)     inverse 12¹⁰/π
   Planck            6.631455962162305657    5/(2³·3·π)
   the Moho      6,366.197723675813431       20000/π
   c_G1    299,789,233.683089268             2³·3⁵·5⁶·π²
   c_G2    299,816,259.863385492             5¹⁶/(2·3⁴·π)
   G2 Balmer limit 364.532859894923335       5¹⁰/(2⁵·3³·π³)
   ground state, G2  13.606116089006034      3³·5³/(2³·π³)
   Mercury's orbit   87.952416356195982      5⁶/(2·3²·π²)
   the 21 cm line 2,110.667714580749664      2⁴·3⁸·π/5⁶

THE GEARS
   31104 = 2⁷·3⁵   10368 = 2⁷·3⁴   864 = 2⁵·3³   9375 = 3·5⁵   3125/1944 = 5⁵/(2³·3⁵)
   12.337005501361698 = π²/8 x 10       α = 0.007295125222248320 = 3²/(5³·π²)
```

NOTES

This paper is the theory's own account. It states the framework's values and the routes to them; it does not score them against published figures, and measured values appear only as science's own account of the reaction in Part Two. Every station of every route in Part Five was computed at forty-four digits and checked against the address beside it.

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