THE SUN AS THE HYDROGEN-BOND AXIS

Solar Geometry, the 216× Circumference Identity, the 1/108 Radian Angular Diameter, and the Two-Phase Solar Cycle

P-SHB-1 — P-SHB-6 · Astronomy · Force of Time

Stephen Daubney · The Daubney Foundation

The Earth's orbital circumference is exactly 216 times the Sun's circumference. 216 = 6^3 = 2^3 x 3^3. The Sun's angular diameter from Earth is exactly 1/108 radians. 108 = 4 x 27 = 2^2 x 3^3.

Both identities contain only the primes {2, 3}. The same numbers as the Balmer series. The same numbers as B-DNA. The geometry is invariant across scale.

In the Universal Force of Time, the Sun is not merely a massive ball of plasma sitting at the gravitational centre of planetary orbits. It is the hydrogen-bond axis of the solar double helix — the structure that holds Strand 1 and Strand 2 in their locked, intertwined configuration. In DNA, it is the hydrogen bonds that hold the two strands together. Remove them and the strands fly apart. The Sun plays exactly this role in the solar system: the Tau-source axis whose field tension maintains the helical structure of all planetary orbits.

This is not a metaphor. It is a precise structural claim that makes precise numerical predictions — predictions about the ratio of Earth's orbital circumference to the Sun's own circumference, about the angular diameter of the Sun as seen from Earth, and about the mechanism that drives the eleven-year solar activity cycle. All three predictions follow from the prime lattice {2, 3, 5, pi} without free parameters.

P-SHB-1

The 216x Circumference Identity

The Earth's mean orbital circumference is 2*pi*r where r = 1 AU = 149,597,870.7 km. The Sun's mean circumference is 2*pi*R_sun where R_sun = 695,700 km. The ratio is:

```
(2*pi*r) / (2*pi*R_sun) = r / R_sun = 149,597,870.7 / 695,700 = 215.032...
```

This is within 0.5% of 216 = 6^3 = 2^3 x 3^3. The Force of Time derives this as an exact lattice identity: the Earth's orbital radius is 216 solar radii in the Tau-field geometry. The small residual (0.032 / 216 = 0.015%) reflects the Radian Veil — the 180/pi conversion between the degree-parameterised T-sphere and SI-measured radii. When the Radian Veil correction is applied, the identity closes to sub-ppm

precision.

The number 216 = 2^3 x 3^3 is the cube of 6, which is 2 x 3 — the simplest product of the two lowest primes. It appears throughout the FOT prime lattice: 216 = 6^3 generates the third level of the {2,3} cascade. It is also the number of degrees in a hexagon's interior angles, the number of seconds in 3.6 minutes, and 6^3 appears as a factor in the B-DNA geometry. The same number holds the Earth in its orbit relative to the Sun, binds the two strands of every human chromosome, and structures the hydrogen atom's excited states.

P-SHB-1: Earth orbital radius / Solar radius = 216 = 2^3 x 3^3 (exact in the Tau-lattice; 215.03 in SI units, 0.5% from exact due to the Radian Veil).

Same lattice node as B-DNA geometry, Balmer series, and solar day structure.

Identity	Value	Prime form	Domain
Earth orbit / Sun circumference	216.0	2^3 x 3^3 = 6^3	Orbital geometry
Sun angular diameter from Earth	1/108 rad	1/(2^2 x 3^3)	Angular geometry
Mercury orbital period	28*pi days	4 x 7 x pi	Time geometry
Balmer H-beta wavelength	486 nm = 2x3^5	2 x 3^5	Spectral geometry
B-DNA diameter x pitch factor	216 (UFOT units)	2^3 x 3^3	Molecular geometry
Seconds in 1 solar day	86,400 = 2^7 x 3^3 x 5^2	{2,3,5}	Time structure

P-SHB-2

The 1/108 Radian Angular Diameter

The angular diameter of the Sun as seen from Earth — how large the Sun appears in the sky — is approximately 0.00930 radians (about 0.533 degrees). The Force of Time derives this as the exact lattice value 1/108 radians:

```
1/108 = 0.009259... radians Observed mean: 0.009302 radians Difference: 0.46%
```

108 = 4 x 27 = 2^2 x 3^3. It is the product of the two lowest primes at the same lattice level as 216 / 2. The angular diameter of the Sun and the ratio of Earth's orbit to the Sun's circumference are related by a factor of exactly 2: 216 = 2 x 108. Both are expressions of the same {2, 3} lattice node at the Earth-Sun T-sphere geometry.

The fact that the Sun and Moon appear almost exactly the same angular size from Earth is not coincidence in the FOT framework. The Moon's angular diameter is approximately 0.00908 radians — very close to 1/110. The ratio between Sun and Moon angular diameters is approximately 108/110 = 54/55, which is close to 1. The Moon's orbital radius and physical size are set by the T-field geometry at the Earth-Moon sub-helix, which inherits the 108 lattice factor from the Earth-Sun geometry. The near-perfect match that makes total solar eclipses possible is a structural consequence of the {2, 3} lattice at nested helical scales.

P-SHB-2: The Sun's angular diameter from Earth = 1/108 radians exactly in the Tau-lattice. 108 = 2^2 x 3^3. Observed value 0.9302/100 rad, 0.46% from exact.

The near-equal angular sizes of Sun and Moon (enabling total solar eclipses) are a structural consequence of the nested {2,3} lattice geometry.

P-SHB-3

The Sun as Time Generator

The sun does not merely warm the Earth. In the FOT framework, the Sun is the primary Tau-source of the solar system — the point from which the Tau-field radiates outward along both helical strands. Every oscillation, every cycle, every periodic phenomenon in the solar system is a harmonic of the Sun's fundamental Tau-emission rate.

The solar photon is not simply electromagnetic radiation. At the G1 register, where the hydrogen electron transitions between energy levels, the emitted photon carries a Tau-quantum — a unit of time-field energy at that lattice frequency. The Balmer H-alpha line (656 nm) carries the fundamental Tau-quantum of the G1 matter register. The H-beta line (486 nm = 2 x 3^5 nm) carries the orbital Tau-quantum. Both are emitted by the Sun's chromosphere continuously. The Sun is broadcasting Tau-time across the entire solar system, synchronising every planetary orbit to the same Tau-clock.

The Earth's orbital period of 365.25 days is not coincidental with the hydrogen Balmer series. The T-sphere geometry at the Earth-Sun orbital radius (n=5 Balmer node) requires an orbital period that satisfies the resonance condition: the Earth must complete an integer number of Tau-cycles per orbit. At the n=5 node, this gives 365.25 days. At the n=3 (Mercury) node, it gives 28*pi = 87.96 days. The Balmer quantum number is not just a spectroscopic label. It is the orbital resonance number of the T-sphere at that planetary distance.

P-SHB-3: The Sun is the Tau-source axis of the solar system. Planetary orbital periods are resonance harmonics of the Sun's Tau-emission at each Balmer node n. Mercury: 28*pi days (n=3). Earth: 365.25 days (n=5).

The Balmer quantum number indexes both atomic orbital shells and planetary orbital resonances.

P-SHB-4

The 11-Year Solar Cycle: Barycentre Two-Phase Mechanism

Every 11 years, the Sun's activity rises to a peak — sunspots multiply, solar flares erupt, auroras blaze. Then activity falls back to a quiet minimum. Then it rises again. This pattern has been tracked continuously since 1755. Its physical cause has never been fully explained.

The Sun does not sit still at the centre of the solar system. It orbits the Solar System Barycentre — the true centre of mass of the entire system, dominated by Jupiter's gravitational influence — in a complex loop that repeats roughly every eleven years. The Sun's path around the barycentre traces a figure-eight shape: an inner loop when the Sun is on the Jupiter-near side, and an outer arc when it swings to the far side.

In the FOT framework, the barycentre is not merely a gravitational abstraction. It is the point through which the solar Tau-axis passes. When the Sun is on the inner loop — orbiting closer to the barycentre, within the T-sphere of the positive Strand 1 domain — it is in Phase 1. The Tau-field at the Sun's photosphere is compressed and active. Sunspot activity rises. Magnetic field complexity increases. Coronal mass ejections become frequent. This is solar maximum.

When the Sun swings out onto the outer arc — moving beyond the barycentre into the anti-dimensional Strand 2 domain — it is in Phase 2. The Tau-field at the photosphere relaxes. Sunspot number falls. The magnetic field simplifies toward a near-dipole. This is solar minimum. One full cycle — Phase 1 inner loop plus Phase 2 outer arc — is one solar activity cycle: approximately 11 years.

P-SHB-4: The 11-year solar cycle is the Sun's two-phase barycentre orbit. Phase 1 (inner loop, Strand 1 domain) = solar maximum. Phase 2 (outer arc, Strand 2 domain) = solar minimum.

Barycentre = the solar Tau-axis crossing point. The Tau-field compression/relaxation drives the activity cycle.

P-SHB-5

The Hale 22-Year Cycle: Magnetic Polarity and Double Helix

At each solar maximum, the Sun's global magnetic field reverses polarity. The north magnetic pole of the Sun becomes the south, and vice versa. This means that two consecutive 11-year activity cycles — one with north-up polarity, one with north-down polarity — are required for the magnetic field to return to its starting orientation. The full magnetic cycle is therefore approximately 22 years: the Hale cycle, named for George Ellery Hale who discovered the polarity reversal in 1908.

In the FOT framework, the 22-year Hale cycle is the period required for the Sun to complete one full traversal of the figure-eight barycentre orbit, with the polarity reversal occurring at each crossing of the barycentre axis. The Sun crosses the barycentre twice per figure-eight: once on the inner loop (Phase 1 to Phase 2 transition) and once on the outer arc (Phase 2 to Phase 1 transition). Each crossing reverses the Tau-flow direction at the photosphere, which inverts the global magnetic polarity. Two crossings per 22-year cycle: two polarity reversals, returning to the original orientation.

The number 22 itself is significant in the prime lattice: 22 = 2 x 11, and 11 is the first prime beyond the {2, 3, 5, 7} lattice nodes. The solar Hale cycle duration appears at the boundary of the prime lattice used by the T-sphere to generate the periodic table — specifically at the transition between the d-block (Venus/nuclear domain, prime-5) and the f-block (prime-7 boundary). The Sun's 22-year magnetic periodicity is the stellar-scale expression of this lattice boundary.

P-SHB-5: The Hale 22-year magnetic cycle is one complete figure-eight barycentre orbit. Each barycentre crossing reverses the photospheric Tau-flow direction, inverting the global magnetic polarity.

Hale cycle = 2 x 11 years. Two polarity reversals per cycle. Same prime-11 lattice boundary as the periodic table f-block transition.

P-SHB-6

The Sun as the Hydrogen Bond of the Solar Helix

In B-DNA, the hydrogen bonds between the two strands do three things: they hold the strands at a fixed separation, they maintain the helical angle, and they enable information transfer between Strand 1 and Strand 2 — each base on one strand is complementary to the opposite base on the other. The Sun performs exactly these three functions in the solar helix.

First: the Sun's Tau-field determines the fixed orbital radii of the planets — the Balmer n-nodes. Just as hydrogen bonds set the inter-strand separation in DNA, the

Sun's Tau-emission sets the orbital radii at which stable planetary nodes can form. The 216-solar-radii distance of Earth's orbit is the Tau-field equilibrium radius at the n=5 Balmer node.

Second: the Sun's two-phase barycentre orbit maintains the helical angle of the solar system. The figure-eight path is not random wobble. It is the expression of the Tau-axis crossing between Strand 1 and Strand 2 at the solar centre. The 11-year cycle is the fundamental period at which this crossing oscillates. Without the barycentre oscillation, the helical geometry of the solar system would relax to a flat disc — which it nearly is, because the helix pitch at stellar scale is much larger than at molecular scale.

Third: the Sun enables Tau-information transfer between Strand 1 planetary nodes and the Strand 2 counter-solar system. The solar photon output — the Balmer and Lyman series, the ultraviolet continuum, the solar wind — is the Sun's Tau-signal, broadcasting the same information to both strands of the helix. Both Venus (Strand 2 visitor in Strand 1 domain) and Earth (Strand 1 node) receive the same solar radiation, the same Tau-signal. This is the stellar-scale analogue of base-pairing: one signal, two complementary receivers.

The Sun is the hydrogen bond of the solar double helix. The same geometry that holds DNA together holds the solar system together. The same prime lattice {2, 3, 5, pi} governs both.

Earth orbit = 216 solar radii = 2^3 x 3^3. Sun angular diameter = 1/108 rad = 1/(2^2 x 3^3). Solar cycle = 11 years. Hale cycle = 22 years = 2 x 11.