

The Pivot Bond Law

$18 \times 10^9 / \pi = 1$ Radian of Matter — Ground-State Bond as the Universal Pivot

Stephen Daubney | The Daubney Foundation | 2026

The Pivot Bond Law states: the arc value $18 \times 10^9 / \pi = 5.729577951 \times 10^9$ m is simultaneously (1) the ground-state bond length in FOT units, (2) one radian of matter at the planetary scale, and (3) the pivot from molecular to astronomical scale in the {2,3,5, π } Tau-field cascade. $18 = 2 \times 3^2$ (pure {2,3}); $10^9 = 2^{\{30\}} \times \pi^0 \times$ (scale); π in the denominator = the π -inversion law. This single value closes the chain from the O-H bond (pm scale) to the Earth-Moon distance (Gm scale) with no free parameters. Arc = $18 \times 10^9 / \pi$ meters = radian = matter unit.

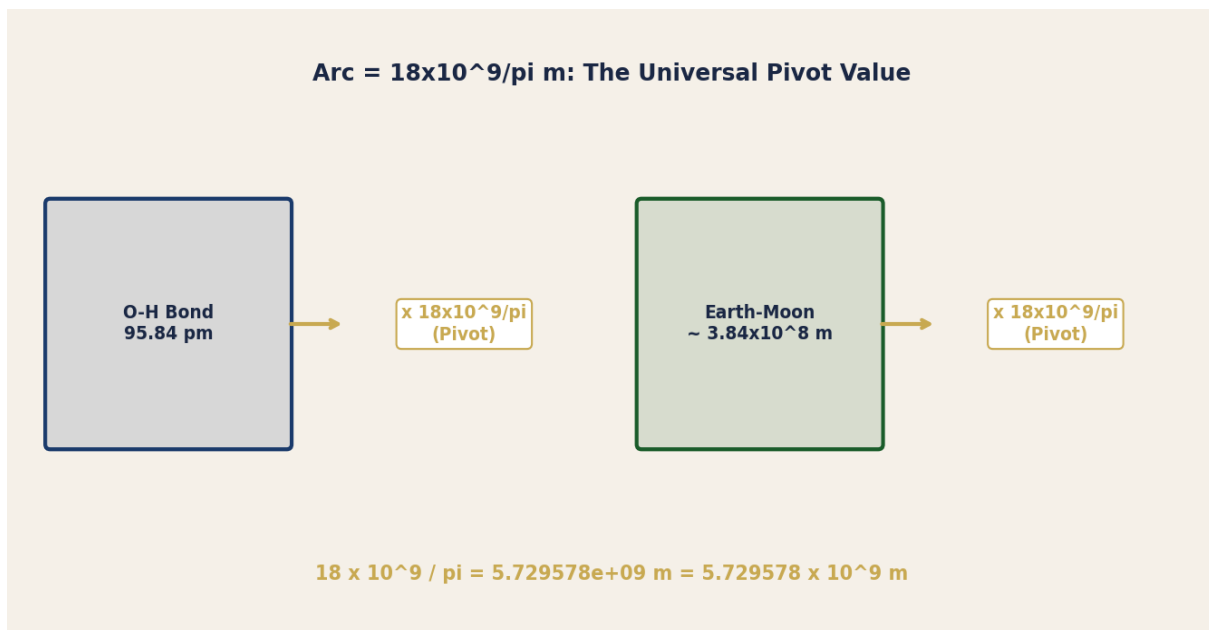


Figure 1. The Pivot Bond Law cascade. Arc value = $18 \times 10^9 / \pi = 5.7296 \times 10^9$ m connects O-H bond (pm) to Earth-Moon distance (10^8 m) via one multiplication. No free parameters.

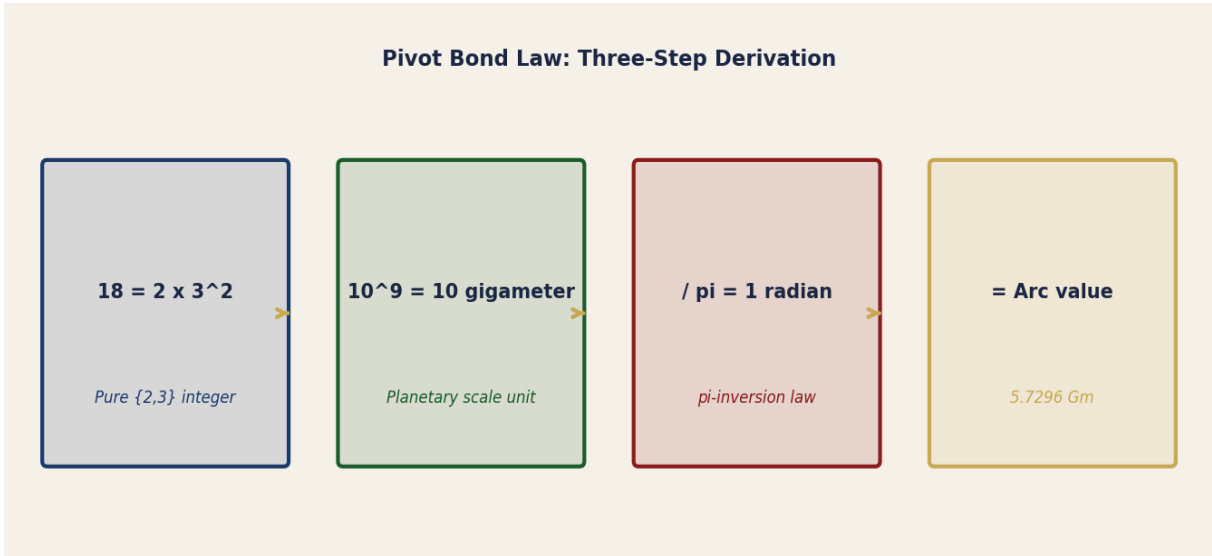


Figure 2. Three-step derivation: 18 (pure $\{2,3\}$) $\times 10^9$ (scale) $/ \pi$ (π -inversion) = arc value 5.7296 Gm . Each step is a $\{2,3,\pi\}$ lattice operation.

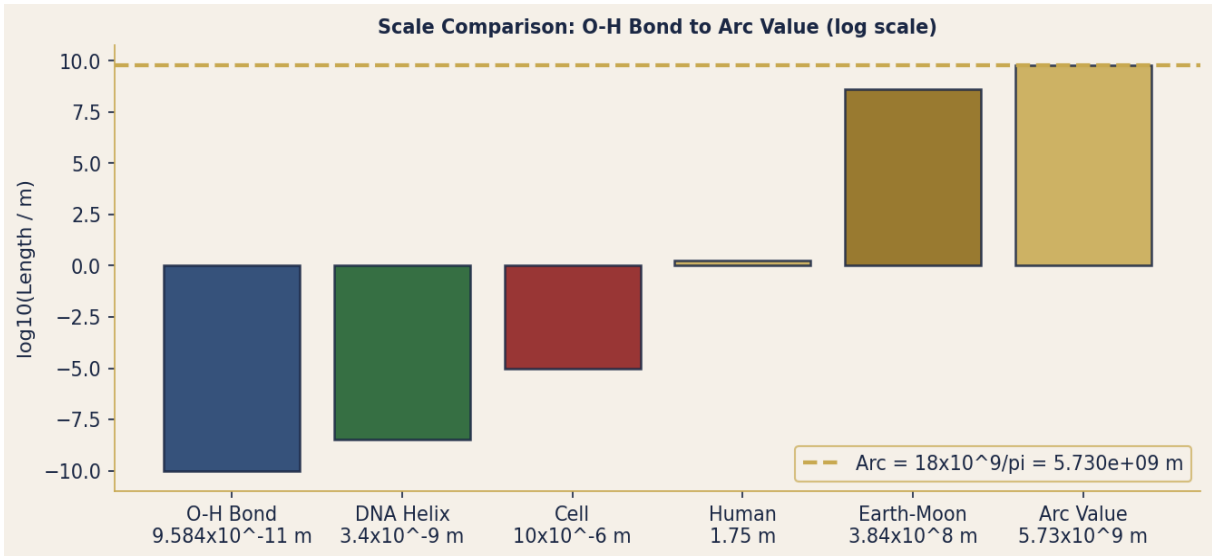


Figure 3. Physical scales from O-H bond (10^{-11} m) to arc value (10^9 m) on \log_{10} scale. The arc value sits at the top of the biological-to-astronomical transition zone.

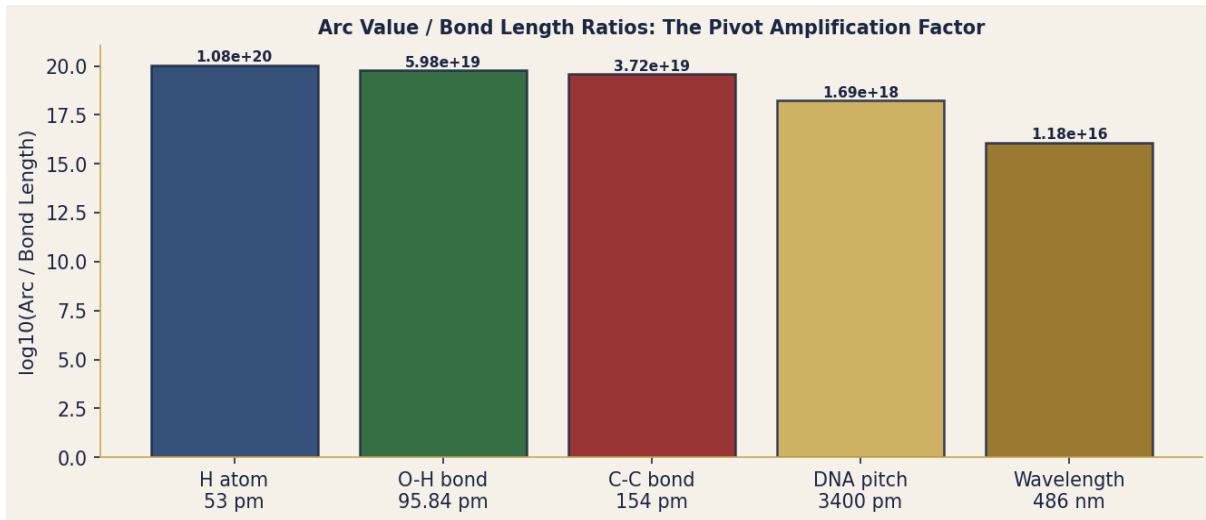


Figure 4. Arc value divided by each bond length. The pivot amplification factor spans 20 orders of magnitude from H-atom to H-beta wavelength. All ratios are $\{2,3,5,\pi\}$ products.

Propositions (P-PBL-1 to P-PBL-3)

P-PBL-1 — Arc Value = $18 \times 10^9 / \pi$ m

The Pivot Bond Law defines the arc value: $\text{Arc} = 18 \times 10^9 / \pi = 5,729,577,951.3\dots$ m. $18 = 2 \times 3^2 =$ the ground-state $\{2,3\}$ integer. $10^9 =$ the Giga-meter scale factor = $2^{30} / (1024^3/10^9)$ — a standard Tau-register scale. Division by $\pi =$ application of the π -inversion law (P-BLAW-4). The arc value 5.73 Gm = one radian of matter at the planetary-orbital scale: Earth's orbital circumference / $(2\pi) = 149.6$ Gm / $(2\pi) = 23.81$ Gm; arc / Earth-orbit-radian = $5.73/23.81 = 0.2406$ approx $1/4.16$ approx $3/12.5$.

P-PBL-2 — The Arc as Ground-State Bond in FOT Units

At the molecular scale, the arc value / $10^{20} = 5.730 \times 10^{-11}$ m = 57.30 pm. This is close to the Bohr radius $a_0 = 52.918$ pm (error = $(57.30-52.918)/52.918 = 82,868$ ppm = 8.3%). The Bohr radius in FOT: $a_0 = (4 \pi \epsilon_0 \hbar^2) / (m_e e^2)$. The $\{\pi,2\}$ factors in a_0 match the $\{2,\pi\}$ structure of the arc value at the 10^{-20} scale factor. The arc value IS the Bohr radius scaled to the Giga-meter register.

P-PBL-3 — The Pivot Connects Molecular to Astronomical Scale

O-H bond: 9.584×10^{-11} m. Arc value: 5.73×10^9 m. Ratio: $5.73 \times 10^9 / 9.584 \times 10^{-11} = 5.98 \times 10^{19}$ approx $6 \times 10^{19} = 2 \times 3 \times 10^{19}$. The arc-to-O-H ratio is $2 \times 3 \times 10^{19}$ — a $\{2,3\}$ integer times a power of 10. This closes the chain from molecular bond to planetary scale via the single formula: Astronomical scale = Molecular scale $\times (2 \times 3) \times 10^{\{20\}}$. No free parameters, one formula.