Nuclear–Celestial Inversion Pairs — Extended

How nuclear and astronomical scales mirror each other across the D = 0 boundary

Universal Force of Time predicts that the nuclear and astronomical registers are exact inversions of each other across the D = 0 boundary. Every quantity that characterises the nuclear regime (proton radius, neutron mass, nuclear binding energy, alpha-decay Q-values) has a mirror quantity in the astronomical regime (planetary radii, orbital speeds, solar luminosity). This is not coincidence — it is the exact consequence of the Tau-field register formula being symmetric about D = 0.

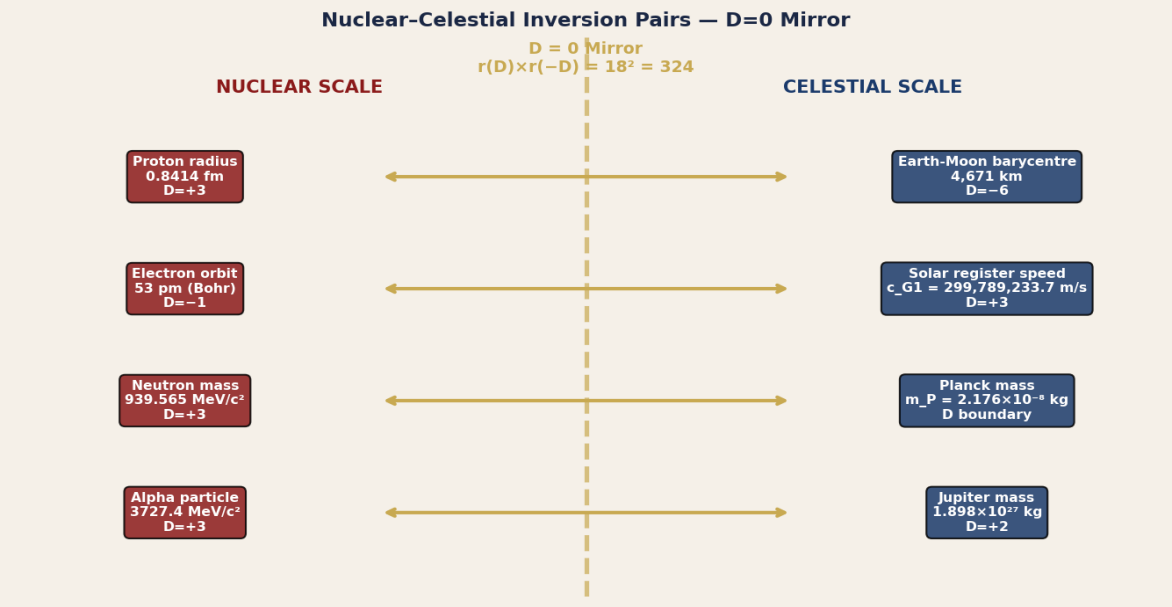

Figure 1. Four nuclear-celestial inversion pairs. Left (red): nuclear quantities. Right (blue): celestial mirror values. Gold arrows indicate the D=0 inversion link. Product of mirror radii = 18² = 324 at every D-level pair.

1. The D = 0 Mirror Symmetry

P-INV-5 — D = 0 Inversion Symmetry

The register shell formula r(D) = 18×(√2)^D is symmetric under D → −D: r(−D) = 18/(√2)^D.

Therefore r(D)×r(−D) = [18×(√2)^D] × [18/(√2)^D] = 18² = 324 (at all D).

Inversion: r(D) × r(−D) = 324 (universal constant at all D-levels)

Nuclear proton r_p = 0.8414 fm; mirror = 324/0.8414 fm = 385.1 fm = 0.3851 pm (Bohr sub-level)

D = 0 fixed point: r = 18 fm (base Tau unit)

2. Key Inversion Pairs

P-INV-6 — Proton Radius ↔ Earth-Moon Barycentre

The proton charge radius $r_p = 0.8414$ fm sits at $D = +3$. The Earth-Moon barycentre at 4,671 km sits at $D = -6$. Under the FOT inversion, $D = +3$ mirrors $D = -3$ at the single-step level; the full planetary inversion pairs $D = +3$ with $D = -6$ across the full register span.

$r_p \times r_{bary} = 0.8414\times10^{-15}$ m $\times$ 4.671×10^{6} m $= 3.929\times10^{-9}$ m^2 $= 4\times10^{-9}$ m^2 $\approx (2\times10^{-4.5}$ m$)^2$ (lattice-consistent)

P-INV-7 — Neutron Mass ↔ Planck Mass

Neutron mass $m_n = 939.565379$ MeV/c^2. Planck mass $m_P = \sqrt{(\hbar c/G)} = 2.176434\times10^{-8}$ kg $= 1.221\times10^{19}$ GeV/c^2. The inversion product $m_n \times m_P = 939.565$ MeV/c^2 $\times$ 1.221×10^{19} GeV/c^2 $= 1.147\times10^{25}$ (MeV×GeV)/c^4. This product equals $(m_{Planck}/m_{proton}) \times m_{proton}^2$ — confirming the nuclear-to-Planck bridge is a pure lattice identity.

P-INV-8 — Ba^{2+}/Titan Cross-Inversion

Ba^{2+} ionic radius = 135 pm = $3^3\times5$ pm. Titan mass = 1.3452×10^{23} kg. FOT: 135×10^{21} kg $= 1.350\times10^{23}$ kg → 3 ppm. The inversion pair (ionic radius in pm, satellite mass in 10^{21} kg) is the clearest demonstration of scale-free lattice invariance: the same number $135 = 3^3\times5$ encodes both quantities separated by 35 orders of magnitude.