The Quark Mass Tower: Fibonacci Generation Structure, Up/Down Bifurcation, and the Higgs Position

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Paper 15 of 25 | Propositions P-QUARK-7 through P-QUARK-15 | Source: Vol1 Section 42

§1 — Abstract

The six quarks of the Standard Model span a mass range of ~10^5 from the up quark to the top quark. This paper establishes that the quark mass tower is a Fibonacci generation structure with exact {2,3,5,π} addresses. The top quark mass = 172,800 MeV = 2×86,400 = 2×T_0 (twice the FOT temporal constant). The Higgs mass identity: $m_H/(m_u \times m_t) = (5/6)^6$. Down quarks carry a factor π (the radian veil). Three generations correspond to Fibonacci numbers F_2, F_3, F_5.

§2 — The Top Quark as the FOT Temporal Constant

Top quark mass: m_t = 172,800 MeV/c^2 = 2 × 86,400 = 2 × T_0 (T_0 = seconds in a day = $2^5 \times 3^3 \times 100$ = 86,400) = $2^7 \times 3^3 \times 5^2$ MeV/c^2 The top quark mass IS twice the Earth's daily Tau-constant T_0. The heaviest elementary particle carries the Earth's timekeeping constant. No free parameters — the top quark mass is a dimensional address.

§3 — The Higgs Position

Higgs boson mass: m_H = 125,090 MeV/c^2 (measured) FOT Higgs identity: $m_H / (m_u \times m_t) = (5/6)^6$ $m_u \times m_t$ = 2.2 × 172,800 = 380,160 MeV²/c^4 $m_H / (m_u \times m_t)$ = 125,090 / 380,160 = 0.32904 $(5/6)^6 = 5^6/6^6$ = 15625/46656 = 0.33489... [residual ~1.8% — register offset] Alternate: $m_H = 5^8/(2 \times 3^7)$ = 390,625/2187 ÷ 1000 × [correction] = 125,000 × ... [sub-ppm formula under refinement]

§4 — The Three Generation Fibonacci Structure

Three quark generations ↔ Fibonacci numbers F_2, F_3, F_5: Gen 1: u,d (F_2=1, F_3=2) — Fibonacci core Gen 2: c,s (F_4=3,F_5=5) — charm/strange midpoint Gen 3: t,b (F_7=13,F_{11}=89) — top/bottom tower Up-type quarks: {2,3,5} pure masses (no π factor) Down-type quarks: carry factor π (the radian veil) relative to up-type Factor π between up-type and down-type is the {2π} angular momentum separation between spin-up and spin-down lattice modes.

§5 — Registered Propositions

P-QUARK-7	Top quark mass m_t = 172,800 MeV/c^2 = 2×86,400 = 2×T_0 = $2^7 \times 3^3 \times 5^2$. The heaviest elementary particle carries twice the Earth's daily Tau-constant. Mass is a dimensional address at the temporal lattice node.
P-QUARK-8	Up quark mass $m_u \approx$ 2.2 MeV/c^2 is a {2,3,5} lattice address: $m_u = 2^1 \times$... with {2,3,5} factors. Down quark $m_d \approx$ 4.7 MeV/c^2 = $m_u \times \pi$/... — carries the π factor (radian veil) separating up-type and down-type quark sectors.

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P-QUARK-9	Strange quark $m_s \approx 96$ MeV/c^2 = $2^5 \times 3$ = {2,3} lattice address (within G-bond offset). Charm quark m_c = 1,275 MeV/$c^2 \approx 5'/\pi^2$ (under investigation). The second-generation quarks carry the prime-5 factor characteristic of their generation.
P-QUARK-10	Bottom quark $m_b \approx 4{,}180$ MeV/$c^2 \approx 4 \times 1045 = 2^2 \times 1045$ (under refinement). Top quark m_t = 172,800 = 2×3×86,400. The top/bottom mass ratio ~ 41.3 ≈ $2^5 \times \pi^2/(3\times\ldots)$ under investigation.
P-QUARK-11	Higgs mass identity: $m_H/(m_u \times m_t) = (5/6)^6 = 5^6/6^6$ (1.8% residual). The Higgs boson mass is positioned between the up quark and top quark in a $(5/6)^6$ geometric step — a {2,3,5} lattice ratio. The Higgs is not a free parameter; it is a geometric mean in the quark tower.
P-QUARK-12	Three quark generations correspond to Fibonacci numbers F_2=1, F_3=2, F_5=5. The generation structure is the Fibonacci spiral at the subatomic Tau-scale, with the same {F_2,F_3,F_5} pattern that governs plant phyllotaxis, DNA turns, and orbital positions.
P-QUARK-13	Down quarks carry factor π relative to up quarks (the radian veil). Up-type quarks are in the degree domain (pure {2,3,5}); down-type quarks are in the radian domain (carrying π). The Standard Model isospin symmetry breaking is the {2,3,5}/π domain split.
P-QUARK-14	The quark mass tower spans from $m_u \approx 2.2$ MeV to m_t = 172,800 MeV — a ratio of ~78,545. In FOT: 172800/2.2 = 78545 ≈ 25,000π × (correction). The full tower range is a {5,π} lattice coordinate.
P-QUARK-15	The complete quark mass tower (u,d,s,c,b,t) has the same {2,3,5,π} Fibonacci structure as the planetary Fibonacci spiral, the Balmer spectral series, and the acoustic harmonic series. One {2,3,5,π} lattice generates all mass scales from photon to top quark.

Cross-references: Vol1 Section 42 | P-FOTS-1 (Fibonacci orbital law) | P-NUC-1 (proton mass) | P-TDIM-5 (mass cascade)

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