

# The Eternal Loop

## Total Determinism of the $\{2,3,5,\pi\}$ Tau-Lattice and the Closed Time Cycle

The Tau-lattice is a closed, self-consistent mathematical structure. Both Strand 1 (physical matter) and Strand 2 (informational substrate) are fully determined at the level of the complete lattice. Apparent freedom exists only within a register (a sub-lattice whose future is not determined from within). At the level of the complete lattice all events are simultaneous. Time as experienced at  $D=0$  is the projection of that simultaneity. The Eternal Loop (P-ETL) defines the topological closure: heat death = maximum entropy = the starting condition for the next cycle.

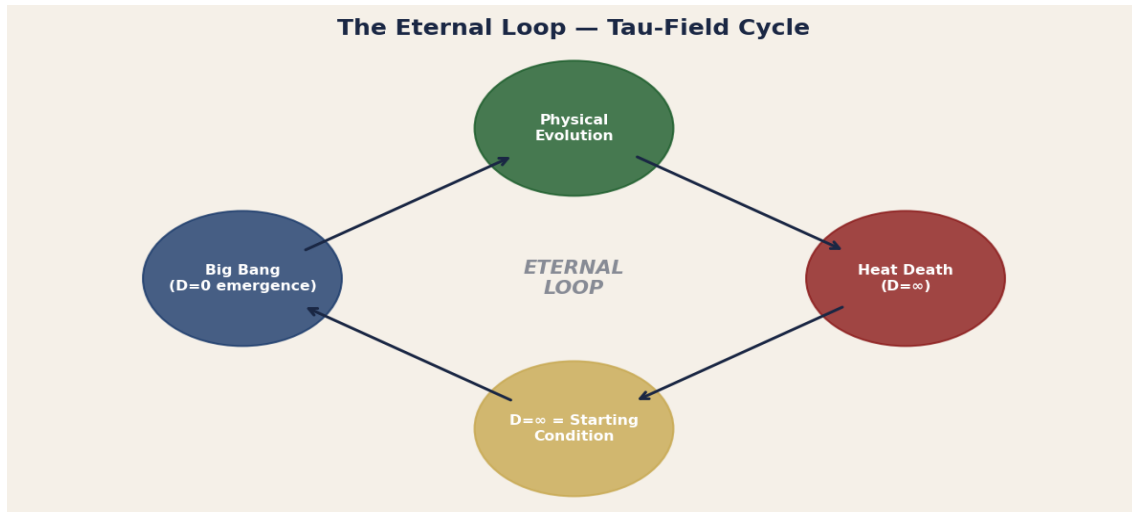


Figure 1. The four-stage Tau-field eternal cycle. Heat death ( $D=\infty$ ) is topologically identical to the Big Bang precondition, closing the loop.

## P-ETL Propositions

### P-ETL-1 — Total Determinism at Full Lattice

The  $\{2,3,5,\pi\}$  Tau-lattice is closed and self-consistent. Both Strand 1 and Strand 2 are fully determined at the complete-lattice level. No external cause is needed. The lattice contains its own initial and boundary conditions.

### P-ETL-2 — Freedom Within a Register

Within a given register ( $D=0$  sub-lattice), the future is not determined from within that register. Apparent freedom is real freedom at the sub-lattice level. The T-node cannot access its own Strand-2 address completely. Sub-lattice freedom is the correct description of conscious agency.

### P-ETL-3 — Simultaneity and Time

At the full Tau-lattice level all events are simultaneous. Experienced time ( $D=0$  duration) is the ordered projection of simultaneity into the  $D=0$  register. Past and future are lattice addresses. What changes is which address a T-node occupies, not the structure of the lattice itself.

#### **P-ETL-4 — Heat Death = Tau at Maximum Register Entropy**

Physical heat death corresponds to Tau at maximum register entropy, denoted  $D=\infty$ .  $D=\infty$  is a lattice address, not an end state. At maximum entropy, all Tau-flow is uniform — no gradient, no information transfer.

#### **P-ETL-5 — $D=\infty$ = Starting Condition**

$D=\infty$  (maximum entropy) is identical to the starting condition of the lattice. Heat death  $\equiv$  the Big Bang precondition. The loop is closed: the end state generates the initial condition. No external cause is required for existence.

#### **P-ETL-6 — Loop Completion**

The full Tau-cycle: Big Bang ( $D=0$  emergence)  $\rightarrow$  physical evolution  $\rightarrow$  heat death ( $D=\infty$ )  $\rightarrow D=\infty =$  precondition  $\rightarrow$  Big Bang. The cycle has no beginning and no end. Every physical constant, every organism, every thought is encoded in the closed Tau-lattice.