

OOI Reference Manual 1: Core Principles of the EGSC Model

Purpose: To establish the fundamental, first-principles axioms of the Emergent Ground State Configuration (EGSC) model.

Axiom 1: Reality is a Discrete, Causal Set

The fundamental substrate of the universe is not a continuous spacetime manifold, but a vast, growing set of discrete, indivisible **events**. The only fundamental relationship between these events is **causality**. For any two events, A and B, A may be in the causal past of B, B may be in the causal past of A, or they may be causally unrelated. The entire geometric and temporal structure of reality is emergent from this simple, relational web.

Axiom 2: Evolution is Governed by a Stationary Action Principle

The structure and evolution of the universe are governed by a single, universal "fitness function" or **Stationary Action Principle**. Every possible causal history is assigned a score by the EGSC action, $S[C]$, and the history we experience is the one that finds an optimal, or "stationary," value for this action. The action is a trade-off between three fundamental drives:

$$S[C] = \alpha N - \beta L + \gamma \sum_i \text{Tr}(\rho_i \log \rho_i)$$

- **αN (Existence):** The cost of creating N events.
- **$-\beta L$ (Structure):** The drive to form L causal links and create a coherent structure.
- **$\gamma \sum \text{Tr}(\rho \log \rho)$ (Information):** The drive to create configurations with high informational richness, measured by quantum entanglement entropy.

Axiom 3: The Universe is a Presentist, Computational System

The EGSC model is fundamentally **presentist**.

- The **Past** is the fixed, recorded memory of the system, encoded in the structure of the present moment.
- The **Future** is an un-computed "latent space" of all possible next states.
- The **"Constructed Present"** is the only causally effective reality. It is the single outcome selected from the latent space by the Stationary Action Principle.

The universe operates like a **Von Neumann self-constructing automaton**, where the emergent configurations of one moment become the physical hardware for computing the next.

Axiom 4: All Structures are Emergent Informational Motifs

Particles, forces, and all complex systems (including life and consciousness) are not fundamental. They are **"informational motifs"**—stable, coherent, self-perpetuating patterns of information that have emerged as highly efficient solutions to the Stationary Action Principle over the universe's history. The reality we experience is a hierarchy of these emergent configurations.