Base Pillars

IaM^e

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1 The Ladder of Emergence

Ladder 1: The Pre-Reality

Reality begins as abstract information itself, with no privileged representation, alphabet, ordering, geometry, or probability measure. Any concrete encoding (binary, ternary, continuous, or otherwise) is a matter of convenience rather than ontology. Entropy, time, and physical law arise only relative to observer-defined representations and coarse-grainings. There is no distinguished substrate or execution mechanism; existence is purely informational.

Ladder 2: The Observer Exists

Since **P** excludes nothing, it necessarily contains finite informational subsets capable of self-reference. The existence of structured, observer-containing worlds requires no external cause; such structures are unavoidable elements of infinite informational potential. Observers are not observing the reality outside—they are sub-sets of it.

Ladder 3: The Static Multiverse

A concrete world may be represented as a finite configuration space

$$\mathcal{C} \cong \{0,1\}^n,$$

where each configuration $\mathbf{s} \in \mathcal{C}$ is a static informational state. There is no motion or dynamics at this level—only the coexistence of all configurations. The binary representation is not fundamental; it is chosen purely for convenience.

Zero and One (yes, no) are not fundamental either. We might equally well write:

$$\mathcal{C} \cong \{Head, Tail\}^n,$$

All configurations are ontologically equal.

Ladder 4: The Emergence of Time

Time is an induced ordering arising from traversals through configuration space. An ordering of states is not given a priori; it is defined only relative to observer paths. Timeless configuration space thus precedes experienced temporality.

Ladder 5: The Observer Filter

An observer history is a finite path through the configuration space.

$$\gamma = (s_1, s_2, \dots), \qquad s_i \in \mathcal{C}.$$

Only a vanishing subset of all possible paths form the observer-compatible set

$$\mathcal{T}_{\text{obs}} \subset \mathcal{S},$$

where $\mathcal{S}$ denotes the space of all paths through $\mathcal{C}$. Only paths in $\mathcal{T}_{\text{obs}}$ possess a subjective "inside" and are experienced as reality.

Ladder 6: The Spectral Selection Principle (SSP)

Observer paths are not equally weighted. Their measure is governed by compressibility in a spectral representation. Paths admitting efficient spectral encodings dominate the ensemble of experienced histories. Formally, preferred histories minimize spectral description length:

$$H_{\text{SSD}} = \arg\min_{H} \mathcal{L}(H),$$

where $\mathcal{L}(H)$ denotes the minimal spectral encoding length of path H. This statistical dominance yields an emergent, finite, and predictable physics without invoking fundamental dynamics.

Ladder 7: The Wavefunction as Optimal Encoding

The quantum wavefunction Ψ is not a physical field but an optimal spectral compression of the observer-path ensemble. Superposition and interference reflect shared substructure within compressed descriptions. The Born Rule emerges as a measure over paths:

$$P(\gamma) \propto 2^{-\mathcal{L}(\gamma)} \sim |\Psi(\gamma)|^2.$$

Thus probability is not fundamental; it is a consequence of informational weighting.

Ladder 8 — Emergent Gravitation: Spectral Compression Geodesics

Physical gravitation emerges as a macroscopic manifestation of the statistical weighting of observer-compatible paths in configuration space.

1. Observer paths and spectral measure: Let $\mathcal{C}$ be the static configuration space, and $\mathcal{T}_{\text{obs}} \subset \mathcal{S}$ the set of observer-compatible paths $\gamma = (s_1, s_2, \dots)$. Each path is assigned a spectral encoding length $\mathcal{L}(\gamma)$ and a corresponding quantum amplitude:

$$\Psi(\gamma) \propto 2^{-\mathcal{L}(\gamma)/2}, \qquad P(\gamma) = |\Psi(\gamma)|^2 \propto 2^{-\mathcal{L}(\gamma)}.$$

The dominant paths are those minimizing their spectral encoding length:

$$\delta \int_\gamma \mathcal{L}(\text{state})\, d\lambda = 0.$$

These paths correspond to the classical trajectories experienced by observers.

Let $\rho(\mathbf{s})$ denote the density of reusable microstructure motifs within configuration space. High-density regions correspond to low spectral cost; an observer path naturally "falls" toward them.

In the continuum limit, the effective metric $g_{\mu\nu}$ is defined by the gradient of spectral cost:

$$\mathcal{L}(\gamma) \approx \int_\gamma \sqrt{g_{\mu\nu}\, \dot{x}^\mu \dot{x}^\nu}\, d\lambda,$$

so that minimizing $\mathcal{L}$ coincides with minimizing proper length in spacetime — i.e., geodesics.

4. Connection to Quantum Theory: Summation over all $\gamma \in \mathcal{T}_{\text{obs}}$ weighted by $2^{-\mathcal{L}(\gamma)}$ reproduces a path-integral-like formalism:

$$\langle \mathcal{O} \rangle = \sum_{\gamma \in \mathcal{T}_{\text{obs}}} \mathcal{O}(\gamma)\, 2^{-\mathcal{L}(\gamma)},$$

where $\mathcal{O}$ is any observable depending on path configurations.

- **Everettian view:** All observer-compatible paths exist simultaneously, no branching; probability arises from spectral measure, not collapse. - **Wheeler–DeWitt view:** Configuration space is timeless; time emerges as an ordering along γ. - **Classical limit:** Low-$\mathcal{L}$ paths dominate, producing smooth geodesic motion as in GR.

Gravitation is thus not a fundamental force but a statistical-geometric phenomenon: *classical geodesics are the trajectories of minimal spectral encoding length through configuration space, weighted by observer-compatible path measure.*