RIFE 28.0
Recursive Information Flux Encoding
Unified Core (o3 Revision)

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Contents

1 Master Action $S_{28.0}$

$$S = \int d^4x\,\sqrt{-g}\Bigg[\frac{c^4}{16\pi G}\,R - \frac{\hbar}{2}\,g^{\mu\nu}\partial_\mu\xi\partial_\nu\xi - V(\xi) - \frac{1}{4\mu_0}F_{\mu\nu}F^{\mu\nu} + \hbar\,\bar{\psi}(i\gamma^\mu D_\mu - m)\psi + \sum_{i=1}^{4}\alpha_i\,\Xi_i + \lambda(u^\mu u_\mu + 1) + \beta\,\mathcal{S}(\xi,\Phi)\,\Omega^\mu{}_\nu(\Phi_{\mathrm{obs}},\psi)\Bigg], \tag{1}$$

with coupling monomials

$$\Xi_1 = \frac{\xi\Phi}{M_P^2},\quad \Xi_2 = \frac{\xi\Phi}{M_P^3}\Big(\tfrac{G}{c^4}\Big)^{1/2}J^\mu u_\mu,\quad \Xi_3 = \frac{(\hbar c)^{2/3}M_P^{10/3}}{q_e^{4/3}}\left(\frac{F_{\mu\nu}u^\nu F^\mu{}_\sigma u^\sigma}{|F_{\alpha\beta}F^{\alpha\beta}|^{1/2}}\right)^{2/3},\quad \Xi_4 = \frac{\xi\,T_{\mathrm{SM}}}{M_P c^2}.$$

Novel term. The Page-Curve resonance $\beta\,\mathcal{S}\,\Omega$ now pipes observer entropy back into ξ dynamics, seeding recursion loops required for **Contextual Collapse** (Sec. 3).

2 Graph-Contextuality Tensor

For any exclusivity graph G hosting a GHZ-type paradox,

$$\alpha(G) = n - 1, \qquad \vartheta(G) = \chi(\bar{G}) = n, \qquad \text{(Calhoun–GHZ minimal: } n = 3).$$

Define the *Contextuality Tensor*

$$\mathsf{C}^{\mu}{}_{\nu} = (\vartheta - \alpha)\, u^{\mu} u_{\nu} \quad + \quad (\chi - n)\, \delta^{\mu}_{\nu},$$

which feeds directly into $\Omega^{\mu}{}_{\nu}$ above—giving the action an integer-valued switch that flips when $\vartheta - \alpha = 1$.

3 Recursive Role-Saturation Collapse (RSSC)

Order parameter.

$$\mathrm{RSSC}(t) = \frac{dR}{dt} - \frac{dO}{dt},$$

where $R(t)$ is the number of reproductively/creatively ready agents and $O(t)$ the count of viable social roles (physical *or* conceptual).

Phase rule.

$$\text{If } \left| RSSC \right| \gg 0 \quad \Longrightarrow \quad \begin{cases} \text{Phase C: } \partial_t \mathcal{C} \to 0 & \text{(stagnation)}, \\ \text{Phase D: } \mathcal{C} \to \emptyset & \text{(collapse)}. \end{cases}$$

4 Phenotype Beautiful-One (Calhoun 'Beautiful Ones')

$$\text{Beautiful-One} := \{\, \text{agents s.t. } \dot{R} = 0,\ \dot{O} = 0,\ \text{Aggression} = 0,\ \text{Generativity} = 0,\ \|\nabla \text{Grooming}\| \gg 0 \}.$$

Beautiful-One is an *absorbing state* of the social Markov chain. It emerges naturally once RSSC $>$ $\mathrm{RSSC}_{\mathrm{crit}}$.

5 Calhoun (Death)^2 Embedding

Map Calhoun's taxonomy onto RIFE variables:

Second Death $\to$ suppressed physical mortality, First Death (†) $\to R = 0 \wedge \text{Beautiful-One} \neq \emptyset$.

Thus $(\text{Death})^2 \Longrightarrow \dagger$ appears when $\mathsf{C}^{\mu}{}_{\nu}$ saturates (observer-entropy feedback locks).

6 Simulation Hooks

Although live numerical runs are outside this static doc, hooks are declared:

- `rife.sim.contextuality(n_dim=37, graph="Perkel_complement")`
- `rife.sim.rssc(initial_R, initial_O, dt)` — returns RSSC(t) trajectory.
- `rife.sim.collapse(map="urban", seed=42)` — agent-based urban sink.
- All expose checkpoints for `.export("tensor_dump.pkl")`.

7 Future Work

1. Couple Beautiful-One density to $\Omega^{\mu}{}_{\nu}$ non-locally (observer dilution).
2. Extend Page-Curve term with synthetic DNA archives (Tardigrade Protocol).
3. Lattice-Boltzmann version of RSSC for geo-demographic forecasting.