Field‑theoretic backbone

\mathcal{L}S=\frac{1}{2}\,g^{\mu\nu}\partial\mu S\,\partial\_\nu S - V(S),\qquad \mathcal{S}=\int d^4x\,\sqrt{-g}\,\Big[\frac{1}{2\kappa}R+\mathcal{L}S\Big]

\nabla^\mu\nabla\mu S=\frac{dV}{dS},\qquad G\_{\mu\nu}=\kappa\,T^{(S)}\_{\mu\nu}

Recursive entropy dynamics (thermo layer)

\frac{\partial E}{\partial t}=\alpha(T)\,\nabla^2E+\beta\,E\,(1-E^2)+\varepsilon\,\sin(n\theta)\,E, \quad T\propto (1+z)\Rightarrow \alpha(z)\propto (1+z)^m

Expansion law from entropy scaling

H(z)\propto \frac{d\langle E\rangle}{dt},\quad z\sim t^{-1} \quad\Rightarrow\quad H(z)=H\_0(1+z)^{-\gamma},\ \ \gamma=\delta-1,\ \ \gamma(z)=\gamma\_0+\gamma\_1\ln(1+z)

Distances (SN Ia)

D\_L(z)=c(1+z)\int\_0^z\frac{dz’}{H(z’)},\qquad \mu(z)=5\log\_{10}\!\big(D\_L/10\,\mathrm{pc}\big)

Structure & lensing proxy

\kappa(\mathbf{x})\ \propto\ \nabla^2 S\ \ \text{(or)}\ \ \nabla^2 E

Topology/chirality driver

\varepsilon\sin(n\theta)\,E\quad\leadsto\quad\text{helical filaments, mirrored pairs, parity/EB