

# Comparison of Theories: GR, QM, and Recursive Horizon Theory

Concept	General Relativity (GR)	Quantum Mechanics (QM)	Recursive Horizon Theory (RHT)
Foundational Quantity	Spacetime metric $g_{\mu\nu}$	Probability amplitude $\psi$	Surface entropy $S(\Sigma)$
Primary Mechanism	Mass-energy curves spacetime	Schrödinger/QFT evolution	Entropy gradient sculpts curvature and time
Gravitational Potential	$\nabla^2\Phi = 4\pi G\rho$	Not central	$\nabla^2\Phi = 4\pi G\frac{\delta S}{\delta V}$
Time	A coordinate influenced by curvature	External parameter	Emergent from entropy asymmetry
Causality	Light cones in curved spacetime	Unitary evolution	Recursive information delay bounded by $c$
Speed of Light $c$	Fundamental geometric limit	Max signal speed in QFT	Max entropy recursion speed in flat limit
Uncertainty	Not inherent	$\Delta x \Delta p \geq \hbar/2$	Arises from recursive surface instability
Quantum Fields	Not intrinsic	Core formalism	Arise from entropy surface tiling
Measurement Collapse	Not treated	Wavefunction collapse (interpretation dependent)	Recursive identity stabilization $\Psi_\infty$
Consciousness	Not addressed	Often observer-related	Emergent from stabilized recursion
Physical Constants	Empirical inputs	Lagrangian parameters	Emergent from recursive thresholds
Role of Entropy	Thermodynamic consequence	Appears in decoherence	Fundamental sculptor of spacetime, time, identity