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Black Hole Singularity with Quantum Geometric Approach

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The emergence of relativistic quantum gravitational effects is well anticipated when the Planck density (m_p/ℓ_p^3, where m_p is the Planck mass and ℓ_p is the Planck length), regardless of whether the prediction of an infinite-density singularity is viewed as a flaw in general relativity. Over the past century, the orthogonality between quantum mechanics and general relativity has been a persistent issue, prompting the dedicated efforts of brilliant scholars. Our focus is on a quantum geometric approach that expands the four-dimensional Riemann geometry (spacetime) to incorporate quantum-mechanical principles. This approach enables a comprehensive exploration of the fundamental nature of the Universe, offering a more profound understanding of the underlying relativity and quantum principles governing its structure and evolution. The quantum geometric approach facilitates the derivation of the fundamental tensor, upon which quantum-mechanically induced revisions are imposed. This, in turn, allows for the construction of the general theory of relativity and the verification of various black hole metrics, while also enabling the examination of initial and space singularities through timelike geodesic congruence.

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