

Beyond Einstein: A Glimpse into Semiclassical Gravity

This work explores the effects of quantum matter on classical spacetime through the theory of semiclassical gravity. Renormalization in curved spaces using Hadamard states is employed to calculate the energy momentum tensor. Solutions in ultrastatic and globally hyperbolic spacetimes are presented, highlighting the complexity of fourth-order semiclassical equations and the conditions required for their formulation. Additionally, applications in cosmology and black hole evaporation are discussed, emphasizing the importance of studying specific cases to advance this theory.

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