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Hubble tension and quantum gravity effects

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Following a new pathway to the definition of the Stochastic Quantization, which hinges on the functional similarities between the Ricci-Flow equation and the Stochastic Quantization Langevin equations, while making use of the Arnowitt-Deser-Misner variables and their conjugated Hamiltonian momenta, we have pushed forward a novel approach to investigate, in a geometrical way, the renormalization group equation for gravity theories. The newly derived equations of the Ricci-Flow are understood in terms of the breaking of the diffeomorphism invariance of the classical theory and encode, as the equation associated to the shift vector, the Navier-Stokes equation with a stochastic source, while the fluctuations of the metric tensor components around the equilibrium configurations follow the Kardar-Parisi-Zhang equation, with intermittent statistics of the probabilistic distribution. Within this framework, we show that the cosmological constant appears as a macroscopic effect of the quantum fluctuation of the metric tensor. Finally, inspecting the cosmological Ricci-Flow of the Friedman-Lemaitre-Robertson-Walker metrics, we develop a phenomenological analysis in order to understand if this paradigm can provide a solution to the Hubble tension.

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