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Curvature for nonperturbative quantum gravity

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One fruitful approach to quantum gravity has been the framework of Causal Dynamical Triangulations (CDT). This path integral approach describes space-time in a nonperturbative and background-independent manner. The Planckian regime is characterized by wild and highly non-classical geometries and general relativity is recovered as an effective theory in the IR limit.

An important question is how to describe operators that are meaningful at the Planck length and flow towards classical equivalents in the IR limit. In this talk I will discuss the construction of "Quantum Ricci Curvature". This novel definition of a quantum implementation of the classical Ricci tensor relies on the average distance between spheres. It contains a natural scale in terms of the radius of these spheres and is applicable in a large variety of situations. I will show how quantum Ricci curvature is constructed and measured and if time permits I will discuss the results obtained for dynamical triangulations. This is based on arXiv 1712.08847 and 1802.10524

Summary

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