Contribution ID: **85** Type: **not specified**

Curvature in Discrete Quantum Gravity

Friday 25 September 2020 17:40 (20 minutes)

Causal Dynamical Triangulation (CDT) is a non-perturbative theory of quantum gravity. It is based on a lattice discretization of general relativity, where the background metric should emerge dynamically. This makes it difficult to construct suitable observables in the model. A recent addition to the list of available CDT observables is the Quantum Ricci Curvature (QRC), which allows one to measure effective average curvature on piecewise flat geometries.

In this talk, I will go over the basics of CDT, and subsequently define the Quantum Ricci Curvature. Furthermore, I will show how it behaves on general triangulated model spaces, and highlight some results in the quantum gravity context. In addition to this, I will explain how to implement the continuum analog of QRC on spaces with isolated singular points of curvature, and how this can provide additional reference points to help us interpret the measurement results of the QRC in a non-perturbative quantum setting.

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Session Classification: Strings & Mathematical physics session on Zoom and in Main Auditorium.

Track Classification: Strings & Mathematical Physics