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The de Sitter Instanton from Euclidean Dynamical Triangulations

Tuesday, 27 July 2021 13:30 (15 minutes)

After a brief introduction of Euclidean dynamical triangulations (EDT) as a lattice approach to quantum gravity, I will discuss the emergence of de Sitter space in EDT. Working within the semi-classical approximation, it is possible to relate the lattice parameters entering the simulations to the partition function of Euclidean quantum gravity. This allows to verify that the EDT geometries behave semi-classically, and by making contact with the Hawking-Moss instanton solution for the Euclidean partition function, I discuss how to extract a value of the renormalized Newton's constant from the simulations. This value is consistent with that of previous determination coming from the interaction of scalar particles. That the same universal constant appears in these two different sectors of the theory is a strong indication that EDT provides a viable formulation of quantum gravity.

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