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Towards the Low-Energy EFT of Euclidean Dynamical Triangulations

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Recent work in Euclidean dynamical triangulations (EDT) has provided compelling evidence for its viability as a formulation of quantum gravity. In particular the lattice value of the renormalized Newton's constant has been obtained by two distinct methods (the binding energy of scalar particles on the lattice, and comparison with the Hawking-Moss instanton). That these calculations yield mutually compatible results is a nontrivial check which indicates that the low-energy effective action of EDT does include the expected Einstein-Hilbert term, and the lattice value of Newton's constant fixes the coefficient of this term in lattice units. To make further contact with the low-energy theory we turn to the two-point function of the scalar curvature, which can be calculated both on the lattice and in the effective theory and which depends straightforwardly on the parameters of the latter. To compare with the lattice predictions we must perform a nontrivial one-loop calculation in the effective theory, which I will discuss in this talk.

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