

Renormalization Group Properties of the Conformal Mode

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The renormalization group properties of a QFT are of profound importance to the theory. In quantum gravity, one runs into the problem that the kinetic term for the dilaton (or conformal mode) has the wrong sign, causing the Euclidean partition function to be (worse than usually) ill-defined. Imposing a new quantization condition allows us to not only make sense of this, but also potentially would allow us to use standard RG techniques to quantize gravity. We see that the effect of resolving this conformal mode “instability” (as described by Hawking et. al.) is to constrain the size of the manifold by its homogeneity. I will present an outline of how this is done and some results from studies of the torus. If time permits, I will also outline ongoing and future work in this area.

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