

3d gravity as a random ensemble

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One of the major insights gained from holographic duality is the relation between the physics of black holes and quantum chaotic systems. This relation is made precise in the duality between two dimensional JT gravity and random matrix theory. In this work, we generalize this to a duality between AdS3 gravity and a random ensemble of approximate CFT's. The latter is described by a combined tensor and matrix model, describing the OPE coefficients and spectrum of a theory that approximately satisfies the bootstrap constraints. We will explain how the Feynman diagrams of the random ensemble produce a sum over 3 manifolds that agrees with the partition function of 3d gravity. Our model makes explicit the intriguing relation between the sum over topologies and the implementation of the bootstrap equations.

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