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Probing typical black hole microstates

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Understanding the geometry of a typical microstate of a large AdS black hole remains an outstanding open problem, which is closely connected to the black hole information paradox. In this talk I will present a proposal for the bulk geometry of typical states. I will discuss how state-dependent perturbations of the CFT Hamiltonian can be used to implement a 1-sided analogue of the “traversable-wormhole” protocol of Gao-Jafferis-Wall. This allows us to probe the region behind the horizon and to gather evidence for the proposed geometry. We identify a precise technical condition for the chaotic behavior of out-of-time-order correlators on typical pure states, necessary for the smoothness of the horizon. We discuss some of these issues in the context of the SYK model.

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