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Towards a microscopic model of AdS fragmentation

Thursday, 18 March 2021 11:30 (1 hour)

A salient feature of black holes near extremality is the appearance of an AdS_2 throat in their near-horizon geometry. Depending on the underlying theory, these AdS_2 throats may be unstable to fragmentation, wherein a single throat is instead replaced by a tree-like structure of branched AdS_2 throats. For Einstein-Maxwell theory, the underlying reason behind this instability is the existence of multi-centered configuration in the moduli space of black hole solutions at fixed total charge. Given the success of the Schwarzian/SYK paradigm for understanding a single AdS_2 it is time to revisit the fragmentation story. To build up intuition, I will present a model, studied in the statistical mechanics literature, that shares many features with SYK, including exact solvability at large-N and an emergent conformal symmetry that gets weakly broken in the UV. The novel feature of this model is the appearance of a spin glass phase at O(1) temperatures, which I will try to relate to the fragmentation story.

45' talk + 15' discussion

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