

Holographic Entropy Cone from Marginal Independence

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This talk will explain recent puzzling revelations in the ongoing efforts to obtain a useful characterization of entanglement structure of geometric states in a holographic CFT, via the so-called holographic entropy cone (HEC). The relations between subsystem entanglement entropies which delimit this cone are known explicitly for only a rather coarse subdivision of the system (specified by N spatial regions, for up to $N = 5$). We argue that, subject to a certain graph theoretic conjecture, the task of finding the HEC for arbitrary N can be recast in terms of a much simpler combinatorial one which effectively reduces to the connectivity of entanglement wedges. More specifically, the N -party HEC can be reconstructed by solving the holographic marginal independence problem (HMIP) for a finer subdivision $N' \geq N$, which technically amounts to identifying which extreme rays of this subadditivity cone are realizable holographically. Curiously, despite the fact that subadditivity is a universal property which states that total correlation cannot be negative, the non-trivial facets of the HEC constructed therefrom nevertheless cannot be recast as correlation measures.

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