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Topological Order in Three Dimensions and Entanglement Entropy of Gapped Phases TARUN GROVER, UC Berkeley, ARI TURNER, University of Amsterdam, ASHVIN VISHWANATH, UC Berkeley — In this talk, I will present two very general, yet easy to understand results in the entanglement entropy of the ground states corresponding to the gapped phases of matter. In particular, I will focus on the following two results: 1) In contrast to the familiar result in two dimensions, a size independent constant contribution to the entanglement entropy can appear for non-topological phases in any odd spatial dimension. 2) The "topological entanglement entropy" corresponding to discrete gauge theories in any given spatial dimension D (and in particular, $D = 3$) has an interesting dependence on the Betti numbers of the boundary manifold defined by the entanglement cut.

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