Entanglement entropy bounds for pure states of rapid decorrelation

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In lattice quantum arrays, the entropy of a pure quantum state's restriction to a subset is a measure of the entanglement between the set and its complement. The talk will present conditions that imply an area-type upper bound on such entanglement at the ground states of positivity-preserving Hamiltonians. In the case of the quantum Ising model in transverse field, the general criterion in any dimensions is satisfied up to the model's quantum phase transition. The condition also implies exponential decay of the state's mutual information between disjoint regions, and hence exponential clustering of local observables.
(Joint work with Simone Warzel)

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