Contribution Title:	ENTANGLEMENT SPREAD AND CLEAN RESOURCE INEQUALITIES
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YRS seminar:	NO

This talk will examine states that superpose different amounts of entanglement and protocols that generate or consume different amounts of entanglement, but run in superposition. In both cases we find a uniquely quantum difficulty: entanglement cannot be conditionally discarded without either using communication or causing decoherence. This phenomenon, which I call entanglement spread, is surprisingly poorly understood given that is a feature of bipartite pure-state entanglement.

In my talk, I'll describe a framework for understanding and working with entanglement spread. Then I'll mention scenarios where entanglement spread does or does not present challenges/opportunities. For example, consider the question of whether there is an advantage to replacing EPR pairs with superpositions of varying amounts of entanglement: I'll show that this does not reduce the communication complexity of evaluating classical functions with distributed inputs, but can exponentially reduce the simulation cost of a bipartite unitary gate. I will also mention a number of open problems, both technical and conceptual.