



Physical Sciences Seminar

From Area Law to Extensive Entanglement Entropy in a New Quantum Phase Transition

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The nature of entanglement in many-body systems is a focus of intense research with the observation that entanglement holds interesting information about quantum correlations in large systems and their relation to phase transitions. In particular, it is well known that although generic, many-body states have large, extensive entropy, ground states of reasonable local Hamiltonians carry much smaller entropy, often associated with the boundary length through the so-called area law. Here we introduce a continuous family of frustration-free Hamiltonians with exactly solvable ground states and uncover a remarkable quantum phase transition whereby the entanglement scaling changes from area law into extensively large entropy. This transition shows that entanglement in many-body systems may be enhanced under special circumstances with a potential for generating useful entanglement for the purpose of quantum computing and that the full implications of locality and its restrictions on possible ground states may hold further surprises.

Tuesday, October 17, 2017 01:30pm - 03:00pm

Big Seminar room Ground floor / Office Bldg West (I21.EG.101)



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