

Massachusetts Institute of Technology
Department of Physics

CONDENSED MATTER THEORY SEMINAR

**“Bulk Entanglement Spectrum reveals
Quantum Criticality within a Topological State”**

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Abstract: A quantum phase transition is usually achieved by tuning physical parameters in a Hamiltonian at zero temperature. Here, we demonstrate that the ground state of a topological phase, a single wavefunction, encodes universal properties of its transition to a trivial phase. To extract this information, we introduce a partition of the system into two subsystems whose common boundary extends throughout the bulk in all directions. The corresponding bulk entanglement spectrum, which resembles the spectrum of a bulk Hamiltonian, allows us to access a topological phase transition by tuning either the geometry of the partition or the entanglement temperature. We illustrate this technique by applying it to the quantum Hall insulator and spin-1/2 chain.

Reference: [arXiv:1305.1949](https://arxiv.org/abs/1305.1949)

2:00pm
Wednesday, May 29, 2013
(Duboc Seminar Room)
Room 4-331