

Chez Pierre

Presents ...

Wednesday, May 22, 2024

2- 2:00 pm

Cosman Room– 6C-422



Special Chez Pierre Seminar

Jong Yeon Lee, University of Illinois at Urbana-Champaign

"Understanding Phases and Transitions in Mixed State Topological Phases"

With the rapid development of quantum simulator platforms, understanding the stability of quantum phases against coupling to the environment has become increasingly important. As a pure quantum state evolves into a mixed state under decoherence, traditional notions of quantum phases require a change of perspective.

In this talk, I will present recent progress in our understanding of mixed topological states from an information-theoretic standpoint, which contrasts sharply with conventional phase descriptions that rely on order parameters and fail to capture mixed state phases. The talk consists of three parts: (i) symmetry protected topological states under decoherence and extracting long range entangled states (ii) decohered topological orders and intrinsic error threshold (iii) faulty measurements and single-shot decodability. This understanding illustrates the deep connection between fault tolerance and the stability of phases in open quantum systems.