Chez Pierre

Presents ...

Monday, September 11, 2023

12:00 pm -1:00 pm

Duboc Room – 4-331

Chez Pierre Seminar

Cenke Xu, University of California, Santa Barbara

"Topology and Quantum Criticality under Weak-Measurement or Decoherence".

Abstract: Decoherence serves as the link between the quantum and classical realms. Decoherence can be viewed as a quantum system being weakly-measured by the environment. We investigate the fate of quantum many-body systems under weak-measurement or decoherence. In particular, we focus on two large classes of systems with very intriguing features under weak measurement: the quantum criticality, and the symmetry protected topological states. We employ a powerful field theory technique to analyze both classes of systems. We demonstrate that, weak-measurement can drive a Wilson-Fisher fixed point into the exotic "extraordinary-log" correlation that was discovered recently in a different context. Furthermore, a symmetry protected topological state can potentially retain its topological feature encoded in the "type-II strange correlator", even though the pure quantum state has been driven into a mixed state ensemble after decoherence.