

# Chez Pierre

Presents ...

Monday, September 30, 2024

12:00 pm -1:00 pm

Duboc Room – 4-331



## Chez Pierre Seminar

Yizhi You, Northeastern University

### **"Decoherence and dissipation induced topological phenomenon in open quantum system".**

In this talk, I will explore decoherence effects in open quantum systems through a holographic lens. While decoherence and dissipation intuitively seem to trivialize quantum states and reduce long-range mutual information, they can, in fact, give rise to intriguing mixed quantum states far from equilibrium. I will begin by discussing the holographic duality between a  $d$ -dimensional mixed-state symmetry-protected topological phase and a  $d+1$ -dimensional subsystem symmetry-protected topological state. This duality links the mixed ensemble in the lower dimension to the entanglement properties of the higher-dimensional wavefunction, offering a practical approach for analyzing nonlinear quantities and quantum information metrics in mixed-state ensembles. I will then extend this holographic perspective to examine symmetry breaking and topological order in open quantum systems, and its connection to sequential circuits.