

# Chez Pierre

Presents ...

**Thursday, February 5, 2026**  
**12:00 pm - 1:00 pm**  
**Duboc room – 4-331**



## Special Chez Pierre Seminar

**Bowen Shi, University of Illinois, Urbana-Champaign**

### “What Is the Entanglement Bootstrap?”

Symmetry has long organized our understanding of quantum many-body phases and phase transitions. The discovery of topologically ordered phases, however, revealed its limitations: such systems are not distinguished by symmetry breaking, but by long-range patterns of quantum entanglement. Fractional quantum Hall liquids in two dimensions provide a well-known example, while similar phenomena—fractionalized excitations and quantized chiral responses—appear more broadly.

This raises natural questions: what ground-state entanglement properties characterize a quantum phase, and can one formulate a theory based on entanglement-based axioms? The research program of the entanglement bootstrap identifies such axioms and uses them to derive (or bootstrap) the low-energy effective field theory. When satisfied with negligible corrections above an intermediate length scale, these axioms define a renormalization-group fixed-point many-body wavefunction, from which anyonic entanglement patterns and quantized chiral response properties can be extracted. Originally formulated to classify gapped many-body phases, the entanglement bootstrap has since been extended more broadly, including to gapless chiral states and to open quantum systems.