

Chez Pierre

Presents ...

Monday, September 8, 2025

12:00 pm - 1:00 pm

Duboc Room – 4-331



Chez Pierre Seminar

Ken Burch, Boston College

"Hidden Ferro-rotational Orbital Order and Axial Higgs in 2D RTe₃ "

Detecting unconventional density waves and identifying their underlying mechanism has proven particularly challenging. Here, I will discuss our discovery of a rare ferro-rotational CDW order from orbital modulation requiring a nontrivial order parameter. Using Raman spectroscopy and quantum interference, we revealed the first Axial Higgs mode and Charge Gap associated with charge order. Additional Raman, Second Harmonic, and Scanning Transmission Electron Microscope experiments establish this occurs in a density wave that breaks all vertical mirrors but maintains inversion symmetry. The Raman and Mu-SR experiments further confirm the absence of time-reversal symmetry breaking. I will discuss how this can be explained by a rare combination of orbital and charge order that results from the unique quantum geometry of Rare-Earth Tritellurides.