

Chez Pierre

Presents ...

Monday, May 15, 2023

12:00 pm -1:00 pm

Duboc Room – 4-331



Chez Pierre Seminar

Ben Feldman, Stanford University

“Moiré band engineering: tuning the itineracy and topology of correlated states”.

When two materials with similar lattice constants are stacked with a small interlayer twist, the resulting moiré superlattice can generate flat electronic bands which host a variety of interaction-driven phases. In this talk, I will describe single-electron transistor microscopy of moiré systems composed from semiconducting transition metal dichalcogenides (TMDs). By modifying the constituent materials, twist angle, and applied electromagnetic fields, we demonstrate control over correlated ground states and excitations, and identify the spin, valley, and real-space character of these states. In particular, our technique enables study in the limit of long moiré wavelength, where we observe intricate phase diagrams of competing electron solids and topological fluids. I will discuss how these findings reflect the interplay between electronic interactions and the nature of the underlying moiré bands.