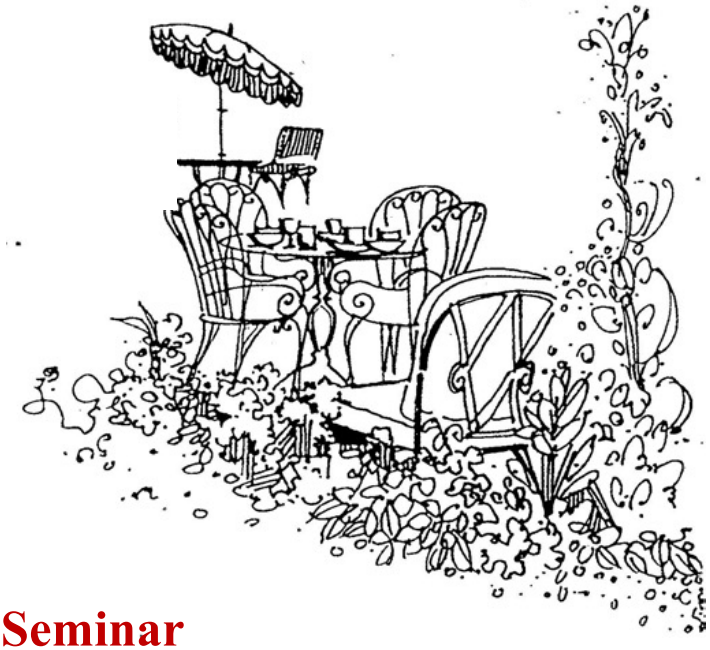
Chez Pierre

Presents ...

Monday, April 13, 2026

12:00 – 1:00 pm

Duboc Room – 4-331



Chez Pierre Seminar

Pavel Volkov, University of Connecticut

"Uncharted moirè territories: square lattices, 3D spirals and twisted superconductors."

In my talk I will review recent theoretical developments on less common twistronic platforms. I will first focus on twisted bilayers of square lattice materials, where emergent momentum-space symmetries near the M point impose the absence of nearest-neighbor tunneling on the moiré scale. Breaking the symmetry by a displacement field allows to realize t-t'-U Hubbard models with a widely tunable t/t' ratio. Second, I will demonstrate the emergence of momentum-selective localization and surface states in semiconductor multilayer spirals around the Γ point. Finally, I will review the present status of physics of twisted nodal and unconventional superconductors, where transformations of both order parameter and quasiparticle spectrum occur under twist, leading to a rich phase diagram including time-reversal breaking and topological states. I will highlight the emergence of moiré-driven gapped nontopological phases in twisted nodal superconductors as well as application of twistronic ideas to the detection of pair density wave states.