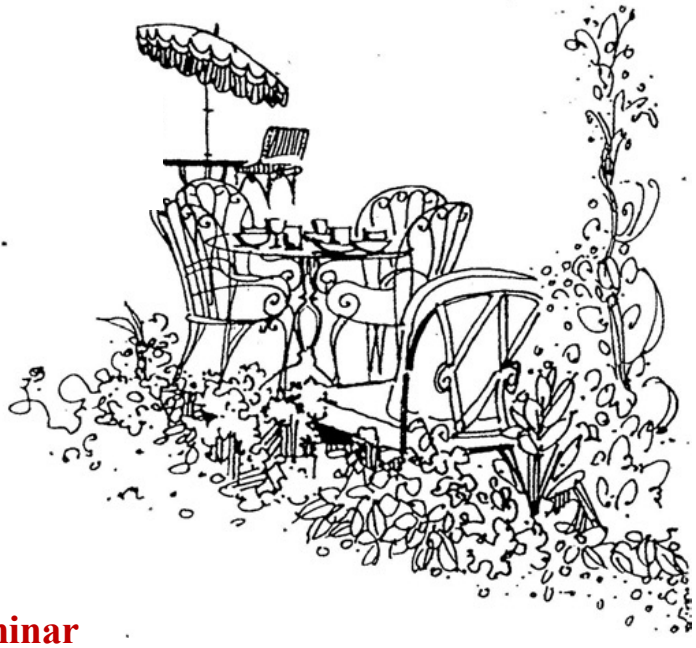
Chez Pierre

Presents ...

Monday, March 10, 2025
12:00 pm - 1:00 pm
Duboc Room – 4-331



Chez Pierre Seminar

Tonghang Han, MIT

"Chiral Superconductivity in Rhombohedral Graphene."

Abstract: Rhombohedral graphene has emerged as a versatile platform for exploring electron correlation and topological phenomena. By exploiting the full tunability of charge density and displacement field via electrical gating, flat electronic bands can be induced and fine-tuned to optimize conditions for exotic ground states. In this talk, I will focus on the chiral superconductivity observed in electron-doped rhombohedral tetra- and penta-layer graphene devices. Our findings reveal spontaneous time-reversal symmetry breaking due to the orbital motion of electrons, with the chiral nature of the superconducting state evidenced by magnetic hysteresis in the longitudinal resistance under varying out-of-plane magnetic fields, robust superconductivity against in-plane magnetic fields and developed within a spin- and valley-polarized quarter-metal phase, and anomalous Hall effect with hysteresis in the normal state. Moreover, a critical out-of-plane magnetic field of up to 1.4 T suggests strongly coupled superconductivity near the BCS-BEC crossover.

Reference: arXiv:2408.15233