Chez Pierre

Presents ...

Thursday, November 10, 2022
11:00 am
Duboc Room - 4-331

Special Chez Pierre Seminar

Chandra Varma, University of California, Berkeley

"Quantum-Criticality and superconductivity in Twisted Bi-layer Graphene".

Twisted bi-layer graphene shares with cuprates, and heavy-fermion and Fe-based anti-ferromagnets, quantum-critical regimes with linear in T or in H resistivity for whichever kBT or gμBH is much larger than the other. I will show why the statistical mechanical model for it is the quantum-xy model coupled to fermion currents. The essentially exact solution of this model will be summarized. The transport properties as well as the specific heat and thermopower proportional to T ln T with a coefficient related to that of the linear in T and the linear in H resistivity follow. The d-wave symmetry of the superconductivity from the coupling to the fermion-loop current fluctuations in TBG is shown. Time permitting I will touch also on work with Liang Fu on WSe2, which has similar properties.