Chez Pierre

Presents ...

Tuesday, October 11, 2022
12:00 pm
Duboc Room - 4-331

Special Chez Pierre Seminar

Cenke Xu, University of California, Santa Barbara

"An exotic metal-insulator transition and a quantum bad metal".

The electrical conductivity/resistivity of a two-dimensional system is a dimensionless quantity, and in many cases (e.g., various quantum critical points in 2d), can be universal. Previous theories of metal-insulator transitions of 2d systems predicted a critical resistivity at the order of h/e^2. Motivated by recent experiment on the transition metal dichalcogenide moiré heterostructures, we propose a theory for an exotic interaction-driven metal-insulator transition, where the critical resistivity can be far greater than h/e^2. We will also construct a "quantum bad metal" phase for strongly interacting electrons, which enjoys a tractable description in terms of the dual vortex degree of freedom. The electrical resistivity of the quantum bad metal phase at low temperature can far exceed the so-called Mott-Ioffe-Regal limit.