

# *Chez Pierre*

Presents ...

**Monday, December 3, 2018**

**12:00pm Noon**

**MIT Room 4-331**

## **Chez Pierre Seminar**

**Feng Wang, University of California - Berkeley**

“Tunable Mott insulator and superconductivity in trilayer graphene/boron nitride superlattices”

Mott insulator plays a central role in strongly correlated physics, where the repulsive Coulomb interaction dominates over the electron kinetic energy and leads to insulating states with one electron occupying each unit cell. In this talk, I will discuss the realization of a tunable Mott insulator in the ABC trilayer graphene (TLG) and hexagonal boron nitride (hBN) heterostructure with a moiré superlattice. Unlike massless Dirac electrons in monolayer graphene, electrons in pristine ABC TLG are characterized by quartic energy dispersion and large effective mass that are conducive for strongly correlated phenomena. The moiré superlattice in TLG/hBN heterostructures leads to narrow electronic minibands and allows for the observation of gate-tunable Mott insulator states at  $1/4$  and  $1/2$  fillings. In addition, signatures of superconductivity are observed at low temperature near the  $1/4$  filling Mott insulator state in the TLG/hBN heterostructures.

