

# *Chez Pierre*

Presents ...

**Monday, September 19, 2022**

**12:00pm Noon**

**Duboc Room 4-331**



## **Chez Pierre Seminar**

**Xiaodong Xu, University of Washington, Seattle**

### **“Interacting Opto-Moiré Quantum Matter”**

Moiré superlattices of 2D materials are an emerging platform for studying strongly correlated phenomena. In this talk, I will present our progress in optical excitation of transition metal dichalcogenide heterostructures. I will firstly present the observation of exciton many-body states - formed by moiré exciton bound with generalized Wigner crystal states.

Then I will present the observation of giant excitonic Hubbard  $U$  towards exploration of Bose-Hubbard model. Lastly, I will discuss the drastic tuning of spin-spin exchange interactions of moiré trapped holes by optical excitation, which results in ferromagnetic order over a small range of doping at elevated temperatures. These results show that semiconducting moiré quantum matter is a versatile laboratory for studying correlated light-matter interaction physics.