

Chez Pierre

Presents ...

Monday, December 12, 2022

12:00pm Noon

Duboc Room – 4-331



Chez Pierre Seminar

Sufei Shi, Rensselaer Polytechnic Institute

"Light-Matter Interaction in Flatland: Excitonic Physics in 2D"

The emergence of transition metal dichalcogenides (TMDCs) ushers in a new era of light-matter interaction. In monolayer TMDCs, the reduced screening enhances the Coulomb interaction and gives rise to strongly bound excitons, which possess a new quantum degree of freedom, valley-spin. In this talk, I will discuss our search for valley-contrasting, long-lived quasiparticles through various optical spectroscopy techniques, which advance our understanding of the many-particle excitonic complexes in monolayer WSe_2 . TMDCs also offer unprecedented opportunities in bandstructure engineering and the construction of moiré superlattices, which host flat miniband and lead to high tunable correlated states in 2D. Over the past few years, we have identified various correlated insulating states in the WS_2/WSe_2 heterostructures. The correlated electrons also interact with both the intralayer and interlayer excitons, leading to the opportunities of engineering and exploration of new correlated excitons.

Biosketch

Sufei Shi is currently an Associate Professor in the Chemical and Biological Engineering Department at Rensselaer Polytechnic Institute. He obtained his Ph.D with Prof. Dan Ralph in Physics from Cornell University in 2012, and he did his postdoc work with Prof. Feng Wang at UC Berkeley from 2011 to 2015. He was awarded ACS Petroleum Research Fund Doctoral New Investigator award in 2018 and the NSF Career award in 2020.