

Physical Seminar

Guest Speaker:
Professor Nick Vamivakas
University of Rochester
Department of Optics



Monday, November 20th
4:00 pm
473 Hutchison Hall
University of Rochester
Department of Chemistry



“Quantum photonics with van der Waals heterostructures”

Abstract: Two-dimensional, atomically-thin, materials have received enormous interest as a result of their unique mechanical, electrical and optical properties. Particularly exciting are the transition metal dichalcogenides – atomically-thin semiconductors that possess an electronic band gap in the visible. Although these materials have been investigated for applications in opto-electronics, not much work has focused on these systems as a platform for quantum photonics and quantum optics. In this talk I will describe two approaches that leverage atomically thin semiconductors, and other two-dimensional materials, assembled in layered van der Waals heterostructures for applications in these areas. In the first part of the talk I will describe the unique photophysical properties of quantum emitters hosted by single layer transition metal dichalcogenides. I will describe our recent efforts to controllably charge the quantum emitters and realize a localized spin-valley-photon interface. I will also present results on realizing negative-mass trion-polaritons that are a manifestation of many body physics arising when coupling the atomically thin semiconductor to a planar optical cavity.

Host : Professor Todd Krauss ○

Email: krauss@chem.rochester.edu