

# Center for Dynamics and Control of Materials: *MRSEC Seminar*

## *Quantum electronic properties at interfaces between semiconductors*

Monday, November 13<sup>th</sup>, 2 pm-3 pm

EER 3.646

Oxide heterostructures based on SrTiO<sub>3</sub> have been a discovery ground for emergent physical phenomena, most notably conductivity at the interfaces between insulators. In this talk I will present our research on the electronic properties of an oxide-semiconductor heterostructure: SrTiO<sub>3</sub>-d thin films grown epitaxially on Si(001). In particular, magnetotransport at low-temperatures shows both strong spin-orbit coupling and electron-electron interactions for certain conditions. I will also present our recent observation of a superconductor to insulator transition from measurements taken at the National High Magnetic Field Lab. Moreover, this same heterojunction shows promise for room-temperature resistive switching applications. Finally, I will present our latest results on the electronic properties of epitaxial PbTe films doped with Thallium on single-crystal CdTe substrates and will discuss their relevance on CdTe-based solar cell applications.



*Nikoleta Theodoropoulou (she/her/hers) is an associate professor in the Physics Department at Texas State University. Her research group focuses on the nanofabrication of devices and the measurement of their electronic and magnetic properties at low temperatures.*

Nikoleta Theodoropoulou, Ph.D.

