

# PHYSICS & ASTRONOMY SEMINAR

## **“Charge Transfer Dynamics in Lead (II) Sulfide Colloidal Nanosheets”**

***Presented by:***  
**Adam Roach**  
Graduate Student  
Dr. Sun’s Lab

**Abstract:** Abstract: PbS nanosheets are an area of interest for opto-electrical devices such as solar cells and photocatalytic cells. Their high absorption coefficient, wavelength tunability, and thermal stability makes them a great candidate for these devices. Nanosheets have better electron mobility over traditional quantum dots. PbS nanosheets were synthesized and tested for charge transport capability. Vertically aligned nanosheets that have been tested showed no charge transport. Testing of regular nanosheets and variation of acceptor nanoparticles and varying cross ligand concentration and type may provide better results.

*Supporting project:*

## **“Ti Color Center for Use in Quantum Information Processing”**

**Abstract:** Titanium was implanted into a  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> crystal. Photoluminescence and cathodoluminescence measurements have been taken. HSE calculations have begun for calculating the bandgap of the structure. A peak of interest was found at 513 nm and its enhancement by titanium is believed to be caused by a gallium vacancy.

**Thursday, January 21st, 2021**  
**4:00 pm**  
**PSLB 112**

