

# Physics Colloquium Oral Presentations

Michigan Technological University

Thursday March 19, 2015

3:30-5:00

Fisher Hall 139

## Synthesis of 1D and 2D Boron Nitride Nanomaterials for Novel Electronic Devices

Shiva Bhandari

Advisor: Yoke Khin Yap

**Abstract:** One dimensional (1D) and two dimensional (2D) boron nitride nanomaterials are wide band gap insulators (~6 eV). This is in contrast to their carbon counter parts. For instance, graphene is metallic and carbon nanotubes (CNTS) are either metallic, semiconducting, or insulating depending on their chirality. My research progress on the synthesis and characterization of (1) 1D carbon/BN heterostructures, (2) 1D graphene nanoribbons, and (3) 2D carbon/BN heterostructures will be discussed.

## Synthesis of Two-Dimensional Molybdenum Disulfide Films and Their Optical Properties

Mingxiao Ye

Advisor: Yoke Khin Yap

**Abstract:** The emergence of two-dimensional (2D) materials has led to tremendous interest in the study of graphene and a series of mono- and few-layered transition metal dichalcogenides (TMDCs). Among these TMDCs, the study of molybdenum disulfide (MoS<sub>2</sub>) has gained increasing attention due to its promising optical, electronic, and optoelectronic properties. One of particular interest is the indirect to direct band-gap transition from bulk and few-layered structures to monolayer MoS<sub>2</sub>, respectively. Here, I will discuss about my research progress on the Synthesis of 2D MoS<sub>2</sub> and their optical properties as characterized by Raman and Photoluminescence (PL) spectroscopy.