



# Workshop Electron Microscopy

PURDUE UNIVERSITY  
**Discovery Park**  
BIRCK NANOTECHNOLOGY CENTER

**Nov 14<sup>th</sup> 2019**  
**Thursday**

**NEW**  
**Capabilities**

**BRK 1001**  
**10am**

**SEM**  
**Apereo**



- Located at the BNC SCIFRES Cleanroom
- Resolution → **0.8 nm** at 30kV and **1 nm** at 1kV
- FE-SEM optimized for high-brightness/high-current with low noise imaging.
- Unique compound lenses for Immersion mode.
- Beam deceleration for higher surface sensitivity and contrast  
Voltages 200eV – 30kV ( 20eV Deceleration)
- Unique set of electron detectors

**FIB-SEM**  
**Helios**



- High-resolution FE-SEM and Focused Ion Beam with low-kV imaging performance and EDX detector
- SEM Resolution → **0.6nm** at 15kV – 2kV and **1nm** at 500V
- FIB Resolution → **4nm** at 30kV and **500nm** at 500V
- Full suit of in-column and in-lens detectors for SE, high-loss BSE, and STEM detection
- Lift out instrumentation for TEM sample preparation

**S/TEM**  
**Themis**



- Probe and Image Corrected with a HT voltage of 60-300kV
- Resolution at 300kV → STEM – **0.06 nm** and TEM – **0.06nm**
- Monochromator and High Resolution EELS detector with an energy resolution of 80meV at 80kV
- Super-X EDS Detector with 4 SDDs with a resolution of < 136eV
- TEM and STEM Tomography available

## Free Registration

Please fill your name and information in the following link  
<https://forms.gle/KKQJTEHn4HxJAprZ7>

Lunch Provided!!  
Vegetarian options!!

## Agenda

10:00 am – SEM Instruments at BNC, **Hitachi** and **Apereo S** in the Cleanroom, **Alejandro Alcaraz**  
10:30 am – FIB-SEM Dual Beam Imaging and Micropatterning at BNC, **Helios G4 UX**, **Xingtao Liu**  
11:00 am – Double Aberration Corrected and Monochromated S/TEM, **Themis Z**, **Rosa E Diaz**  
11:30 am – Tomography in the S/TEM, **Themis Z**, **Chris Gilpin**  
11:45 am – Overview of The Electron Microscopy Facilities at Purdue University, **Chris Gilpin**  
Lunch Session:  
12:05 pm – Imaging capabilities at the Surface Analysis Laboratory, **Dmitry Zemlyanov**  
12:20 pm – FIB cross-sections of deeply scaled SiC trench and gate oxide roughness, **Madan Sampath**  
12:35 pm – The impact of FIB on III/V Nitride Semiconductors sample prep for HRSTEM, **Trang Nguyen**  
12:50 pm - Atomic scale characterizations on nano materials in Themis Z, **Jie Jin**



## CONTACTS

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<https://wiki.itap.purdue.edu/display/BNCWiki/>

## TRAINING AND SERVICES AVAILABLE

- ✓ 1-1 Sessions and User Support
- ✓ Imaging and Elemental Chemical Analysis
- ✓ Patterning and Slice-and-View
- ✓ TEM sample preparation
- ✓ Tomography and 3D reconstruction