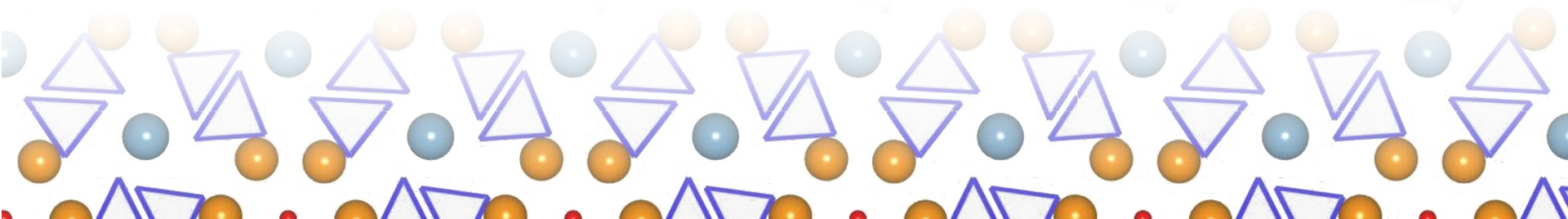


# Materials Characterization Laboratory

Taylor D. Sparks

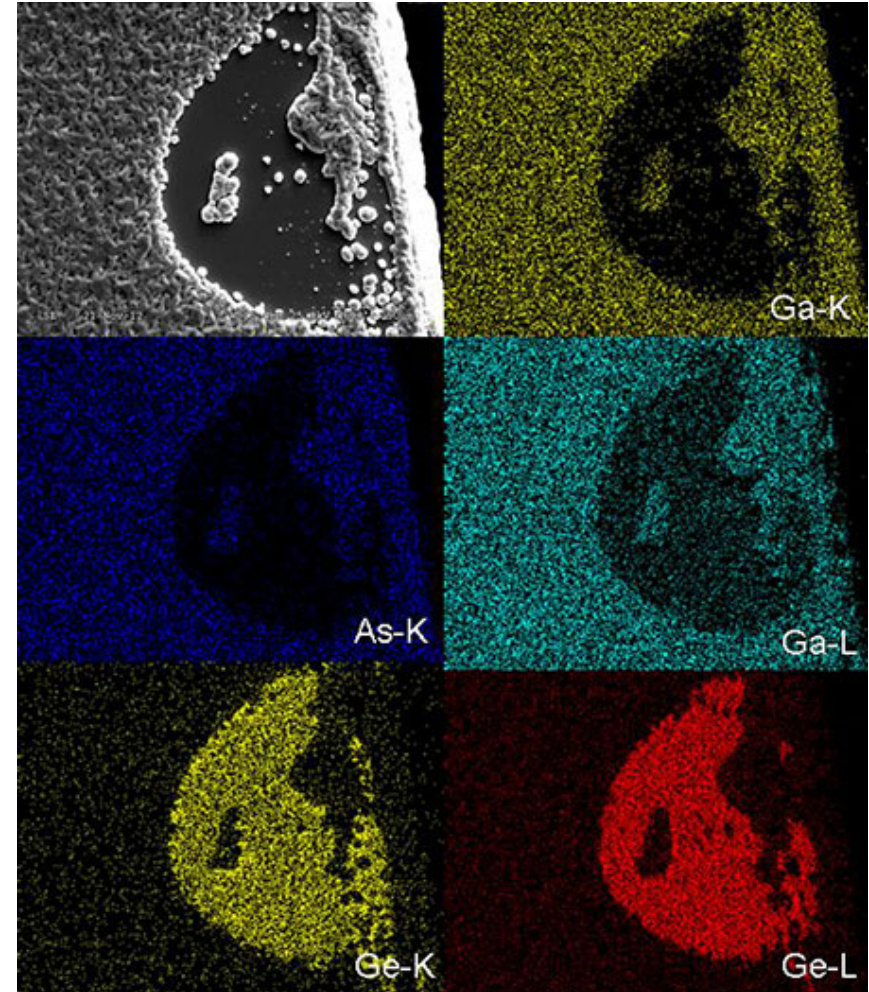
Materials Science and Engineering Department



- The Materials Characterization Lab is the only general user facility for research in the Materials Science and Engineering Department.
- We house several pieces of equipment and offer a variety of characterization capabilities for many types of material systems.
- The facility caters to researchers with many scientific backgrounds. We welcome users of a broad spectrum, ranging from undergraduate students to professional engineers and scientists.
- The facility is staffed by students with oversight from Professors Taylor Sparks and Mike Scarpulla.

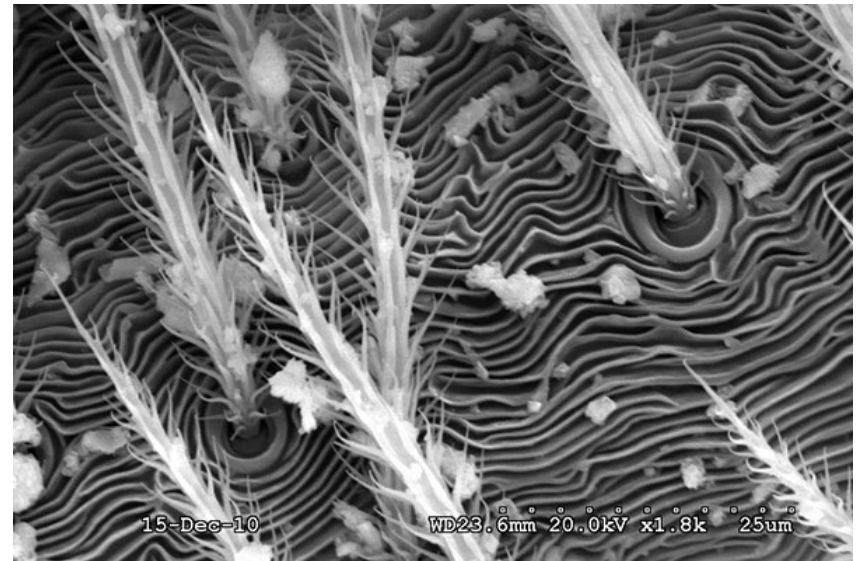
# Spectroscopy Equipment

- Powder X-ray Diffraction
  - Phase Identification
  - Reitveld Refinement
  - Data Base Search
  - Table Top and Full Sized Units
- Fourier Transform Infrared Spectroscopy
  - Spectroscopy in the Mid IR range
  - Absorbance and Transmittance Measurements
  - Attenuated Total Reflectance Accessory
- Ultraviolet-Visible-Near-Infrared Spectroscopy
  - Absorbance, Transmittance, and Reflectance Measurements in the UV-Visible-NIR Range
- Energy Dispersive Spectroscopy
  - Equipped with SEM
  - Elemental Composition Analysis



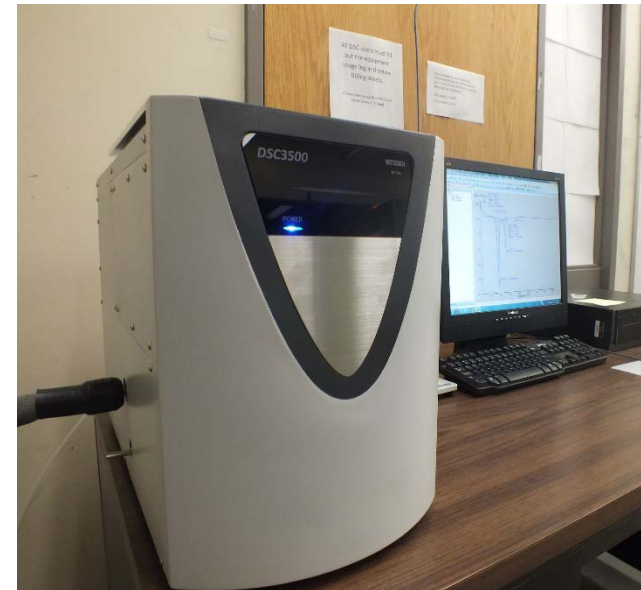
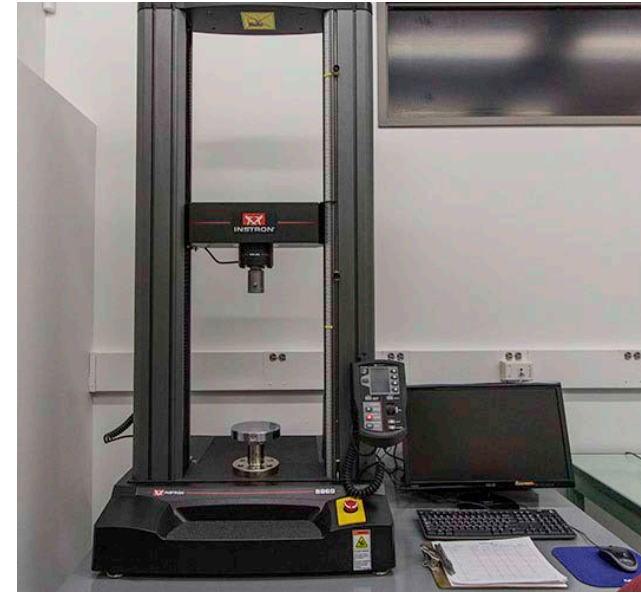
# Microscopy Equipment

- Optical Microscopes
  - Metallographic Analysis
  - Camera Tools
  - Quantitative Phase Measurements
- Scanning Electron Microscope
  - Grain Size Analysis
  - Morphology
  - Sub-Micron Resolution
- Atomic Force Microscope
  - Nanoscale Surface Topography



# Thermal and Mechanical Testing Equipment

- Instron Tensile and Mechanical Testing
  - Stress, Strain, Creep, Measurements
  - Tensile, Compression, Flexure Testing
  - Loads up to 50kN
- Differential Scanning Calorimeter
  - Phase Transition Measurements
  - Heat Capacity
  - Measurements from -250-600 Degrees C
- Dilatometer
  - Thermal Expansion up to 1200 Degrees C



# Other Tools

- Sample Preparation:
  - Diamond Saw
  - Hot Press Mounting
  - Automatic and Manual Polishing and Grinding Equipment
  - Consumables for Metal and Ceramic Microscopy Preparation
  - Conductive Gold Sputtering
- Surface Area and Pore Analyzer
  - Surface Area and Pore size Analyzer using B.E.T. Method

