**“Shared Research Facilities (SRF)” Cores**

**Available to WVU Investigators**

Several well-equipped core facilities support research at West Virginia University. The facilities are significantly subsidized by institutional support and generally recover a portion of their operating costs on a charge basis. A designated individual manages the day-to-day operations in each core. These facilities have both user and service options.

BioNano Research Facilities (SRF)

The BioNano Research Facility of the WVU Shared Research Facilities provides access to instrumentation for researchers at the intersection of biology and nanomaterials. This facility houses instrumentation to analyze cell cultures, biomolecules and fabricated or synthetic materials. The major instruments include a Thermo Scientific Q Exactive Orbitrap LC-mass spectrometer for qualitative or quantitative measurements of proteins, peptides and small molecules; Bio-Rad 1D/2D electrophoresis and imaging system for protein characterization and separation; Olympus IX81 inverted confocal fluorescent and EVOS digital brightfield microscopes for imaging; a Horiba Fluorolog-3 spectrofluorometer for fluorescent characterization; a Jasco J-810 Circular Dichroism spectrometer for protein secondary structural or conformational characterization; a Thermo SpeedVac concentrator for drying biological samples; and standard cell culture equipment (CO2 incubators, biological safety cabinets, refrigerators, freezers (-20 °C and -80 °C), cryostorage, a MilliQ water purification system, autoclave, water bath, and sonicator).

[http://sharedresearchfacilities.‌wvu.edu/‌facilities/‌bionano-research](http://sharedresearchfacilities.‌wvu.edu/%E2%80%8Cfacilities/%E2%80%8Cbionano-research)

Cleanroom Facilities (SRF)

The Cleanroom Facilities of the WVU Shared Research Facilities, located in the Engineering Sciences Building and in White Hall, are laboratories for fabricating electrical and photonic devices, specialty materials, and microfluidic devices. The Engineering Sciences Building suite of labs consists of 2,100 sf of clean space and accompanying support spaces. The cleanroom in the Engineering Sciences Building includes class 100, class 1,000, and two class 10,000 rooms. The facilities are capable of photo- and e-beam lithography, wet chemical processing, metallization and deposition through e-beam evaporation or sputtering, reactive ion etching, thermal processing, and sample packaging. The cleanroom suite in White Hall consists of 950 sf of clean space and 330 sf of entry lab preparatory space. The cleanroom in White Hall includes a class 1,000 space, a class 10,000 space, and necessary support spaces. These facilities are capable of photolithography, Rf and DC sputter deposition of metals, magnetic materials, and oxide materials, RHEED MBE growth of complex oxide materials through Pulsed Laser Deposition (PLD), deposition of multi-component materials through Pulsed Electron Deposition (PED), and sample dicing.

<http://sharedresearchfacilities.wvu.edu/facilities/cleanroom>

**Electron Microscopy Facilities (SRF)**

 The Electron Microscopy Facilities of the WVU Shared Research Facilities maintains unique capabilities for electron beam characterization. These facilities offer a series of investigative techniques such as high magnification surface morphology, phase contrast imaging, X‑ray compositional and phase mapping, energy dispersive spectrometry, electron diffraction and high resolution imaging in the sub-micron scale. Support instruments allow for sample preparation for microscopy from a wide variety of materials and biological sources. Techniques include cutting, grinding, polishing, ion-milling, carbon and metal coating, prefixing, fixing and postfixing, staining, embedding, and sectioning. The facilities’ major equipment includes a JEOL JEM-2100 transmission electron microscope, a JEOL JSM-7600F scanning electron microscope in the SRF Cleanroom Facilities, and a Hitachi SEM S4700 scanning electron microscope.

 <http://sharedresearchfacilities.wvu.edu/facilities/electron-microscopy>

**Materials Characterization Facilities (SRF)**

The Materials Characterization Facilities of the WVU Shared Research Facilities provide users with instruments to characterize the structural, chemical, electrical, optical and magnetic properties of materials. The facilities are equipped for X-ray diffractometry including a PANalytical X’Pert Pro XRD for identification of single-phase materials and multi-phase mixtures, a Bruker D8 Discovery XRD for determining the crystal structure of solids, powders and thin films and for reciprocal space mapping. A Physical Electronics PHI 5000 VersaProbe x-ray photoelectron spectroscopy/ultraviolet photoelectron spectroscopy system is available for micro-area element composition and chemical state determination at a material surface. A Digilab FTS 7000 Fourier transform infra-red (FTIR) spectrometer system is used for analyzing the chemical composition of micro/macro samples and qualitatively identifying molecules and functional groups. A Renishaw InVia Raman spectroscopy microscope is used to determine chemical composition, molecular structure and molecular interactions and for quantitative analysis of material chemical compositions. A J.A. Woollam M-2000U Ellipsometer is available for characterizing film thickness with Angstrom accuracy and for determining the optical constant of materials. Two atomic force microscopes, a Nanoscope MultiMode AFM and an Asylum MFP-3D AFM, are available for obtaining 3D surface topography at sub-nanometer scale resolution.

<http://sharedresearchfacilities.wvu.edu/facilities/materials-characterization>