



# OBJECTIVES

## TO EXPAND WV'S NSEE RESEARCH

- Advance NSE research in *Molecular Recognition and Transport* by building and bridging the state's core research strengths in electronic and photonic materials, devices, and biomolecular research strengths at their intersection.
- Build a center of integrative NSE research addressing molecular recognition applications in health, security, energy, and environment.

## TO SOLIDIFY WV'S NSEE RESEARCH ENTERPRISE

- Build, manage, and promote access to shared NSE equipment and facilities.
- Facilitate research across colleges and departments, industry and government.

## TO BUILD NSEE CULTURE

- Bridge science and education at the K-12, undergraduate and graduate levels.
- Achieve a culture where coordinated interdisciplinary research and educational activities are encouraged.

**25** COLLABORATING  
FACULTY MEMBERS...  
**3** INSTITUTIONS



## REGIONAL COLLABORATIVE LINKAGES

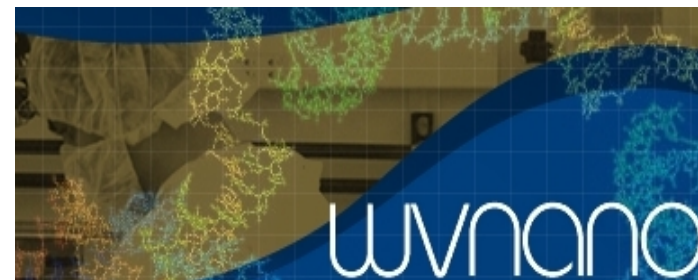
DOE National Energy Technology Laboratory  
MU Cell Differentiation & Development Center  
Protea Biosciences  
WVU Mary Babb Randolph Cancer Center  
WVU Neurosciences Center  
NSF Center for Identification Tech. Research  
University of Pittsburgh  
Carnegie Mellon University

[wvnano.wvu.edu](http://wvnano.wvu.edu)

## WVNANO

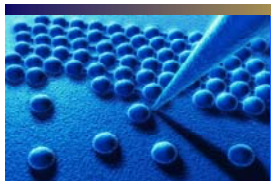
886 Chestnut Ridge Road Phone: 304-293-8281  
PO Box 6223 Fax: 304-293-6213  
Morgantown, WV 26506 E-mail: [wvnano@mail.wvu.edu](mailto:wvnano@mail.wvu.edu)

Dr. David Lederman - Interim Director  
Phone: 304-293-3422 ext. 1494 304-293-8281  
Phyllis Barnhart—Assoc. Director, Education & Outreach  
Phone: 304-293-6667



WEST VIRGINIA'S  
STATEWIDE NANOSCALE  
SCIENCE, ENGINEERING, AND  
EDUCATION INITIATIVE

WVNANO.WVU.EDU  
TEL: 304 293 8281



# ABOUT WVNANO



# EDUCATION

## THE INITIATIVE

The WVNano Initiative is the WV's focal point for discovery and innovation in nanoscale science, engineering and education (NSEE).

WVNano's central objective is to foster an interdisciplinary research environment and diversify West Virginia's economic base through cultivation and growth of research in targeted NSE areas. The Initiative's research builds on and connects our core strengths to build interdisciplinary efforts resulting in new technologies.

Our technical efforts target coordinated discovery in materials, devices, and biomolecular systems to advance molecular recognition and transport device innovation for applications in the areas of environmental security, health, and energy.

## THE RESEARCH

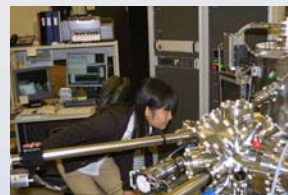
Our Functional Building Block Groups (FBBGs) are formed around the recognition and transport building blocks necessary for integrated molecular recognition systems:

- Electronic Molecular Recognition and Transduction
- Photonic Molecular Recognition and Transduction
- Nano/microfluidic Transport
- Nanokinematic Transport

FBBGs couple our strengths in electronic and photonic materials and devices with molecular biology, proteomics, and microfluidics.

## SHARED FACILITIES

WVNano is steward of an extensive set of facilities and equipment resources that support NSE research. WVNano works in coordination with its faculty, university administration, and the State to operate, maintain and advance these university capabilities for research, education, and economic development.



### Materials and Device Growth, Fabrication, and Characterization

- Multifunctional Materials Lab (MML)
- MOCVD Growth and Characterization Lab
- Device and Integrated System Design, Fabrication, and Characterization

- Nanosystem Eng. Shared Clean Room Facility
- Integrated Nano/Micro System Design Lab
- Photonic and Electronic Technologies Lab
- Microfluidic System Fabrication

### Biomolecular Discovery, Design, and Characterization

- Biomolecular Core Laboratories

### Nanoscale Imaging and Characterization

- Nanoscale Imaging and Characterization Lab
- Optical and Probe Microscopy Facility

## THE RESOURCES

WVNano's core support comes through a \$9M NSF EPSCoR Research Infrastructure Grant. The State of West Virginia, through WV EPSCoR, is contributing an additional \$4.5 million, bringing the total federal and state commitment to \$13.5 million to date. West Virginia University has committed \$8.2M in support of this effort, consistent with its leadership role.



## EDUCATION & OUTREACH

Education, Human Resources Development and Outreach (EHRDO) activities are an integral component of WVNano. WVNano envisions a comprehensive effort to not only enhance formal education but also informal education to foster public awareness, engagement and understanding of nanoscale science, engineering and technology. WVNano initiates, partners with, builds upon and extends other NSF-funded EHRDO projects and University-supported initiatives in order to:



- Bridge science and education via integrative programs
- Develop and diversify the science, technology, engineering, and mathematics (STEM) workforce
- Transform the academic culture and environment in order to increase retention and graduation rates among STEM students
- Support faculty development through grant training and mentoring

