James Madison University Research Resources

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Institutional Philosophy

- Educational mission is top priority
- Grants are primary funding vehicle
- Interdisciplinary collaboration across:
  - college departments
  - university colleges
  - university divisions
  - within the community
  - throughout the state

Core Support

- No university level administration
- CISAT and the School of Engineering through CISAT/SOE Laboratory Operations
- CSM managed on a departmental level with some degree of inter-departmental cooperation
- *Personnel*: a mix of state and grant funding
- *Equipment*: grant purchased, “new” building funds, department operation funds, and ETF as available

Examples of Collaborative Lab Environments

- Biomanufacturing Labs
- Microfabrication Cleanroom
- Shenandoah Valley Regional NMR Facility
- Product Realization Lab
- Advanced Fluid Flow Visualization Lab
- Alternative Fuels Vehicle Lab
- Science on a Sphere
- Edith J. Carrier Arboretum
- Energy Lab

Biomanufacturing Labs

- Research and development of genetically engineered cells, small-scale production of living cells, purification of recombinant proteins, and analytical analysis of product molecules
  - Collaboration across departments, colleges, and in collaboration with SRI International (Harrisonburg, VA)
- **Cross-college departments and disciplines involved:**
  - Integrated Science and Technology
  - Biotechnology
  - Biology
  - Chemistry
  - Bioinformatics
- **University contact:** Dr. Bob McKown, mckownrl@jmu.edu

Biomanufacturing Labs

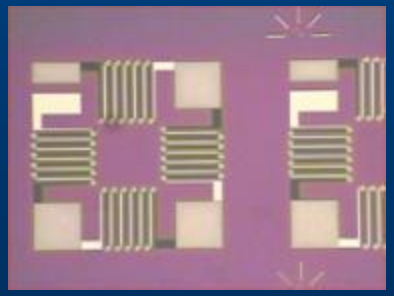
Microfabrication Cleanroom

- A cleanroom facility housing equipment for the fabrication and characterization of thin film materials, microelectronic devices, micromechanical devices, and sensors.
- Processes investigated in this laboratory include thin film metal and dielectric deposition, etching, photolithography (patterning), and semiconductor doping.

- **Cross-college departments and disciplines involved:**
  - Chemistry
  - Biochemistry
  - Physics
  - Mathematics
  - Statistics
  - Engineering
  - Materials Science
  - Integrated Science and Technology

- **University Contact:** Dr. David Lawrence, lawrendj@jmu.edu

Microfabrication Cleanroom



Shenandoah Valley Regional NMR Facility

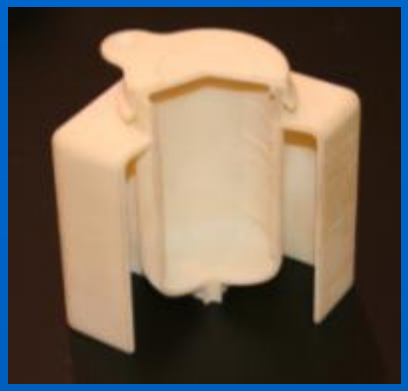
- The Shenandoah Valley Regional NMR Facility was established with grants from The National Science Foundation, The Merck Foundation and matching funds provided by James Madison University, Eastern Mennonite University and Bridgewater College.
- The facility includes a Bruker Avance DRX-400 NMR, a Bruker AMX-200 NMR, and a 300 MHz Bruker DPX system.
- **Cross-college departments and disciplines involved:**
  - Chemistry
  - Biochemistry
  - Physics
  - Engineering
  - EMU
  - Bridgewater College
- **University Contact:** Tom Gallagher, gallahtn@jmu.edu

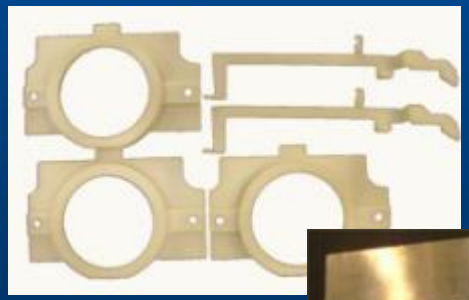
Shenandoah Valley Regional NMR Facility

Product Realization Lab

- **Center for High Performance Manufacturing**
  - A state-of-the-art manufacturing facility that provides high quality prototype models, in order to develop solutions to meet specific needs from design to production, providing metal (steel) and plastic (nylon) prototypes and limited-run plastic part manufacturing
- **Cross-college departments and disciplines involved:**
  - Integrated Science and Technology
  - Geographic Science
  - Art
  - Engineering
  - Business
  - Biotechnology
- **University Contact**: Mr. Dwight Dart, dartdr@jmu.edu

Product Realization Lab





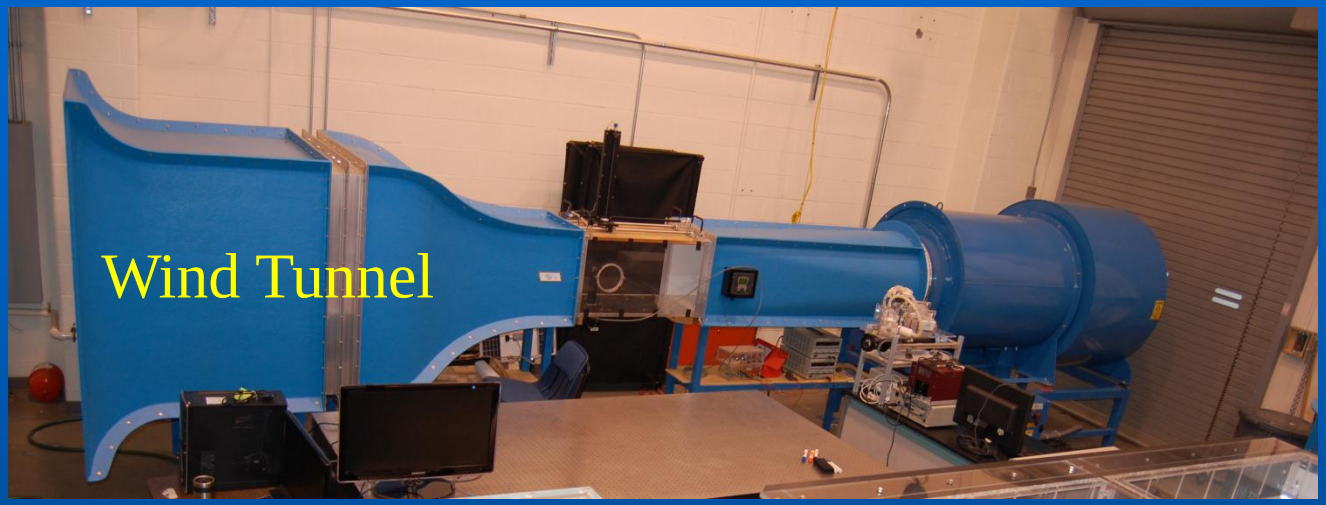
Advanced Thermo Fluids Lab

- An advanced experimental fluid mechanics laboratory for studying the broad range of applications including cardiovascular, aerodynamic, and hydrodynamic flow.

- **Cross-college departments and disciplines involved:**
  - Integrated Science and Technology
  - Engineering
  - Physics
  - Physics
  - Biology
  - Biotechnology

- **University Contact**: Dr. Olga Pierrakos (SOE), pierraox@jmu.edu
  Dr. Karim Altaii (ISAT), altaikx@jmu.edu
  Dr. Heather Watson, watsonhl@jmu.edu

Advanced Thermo Fluids Lab



Particle Image Velocimetry System

Heart Simulator

Alternative Fuel Vehicle Lab

- Collaborative lab involving CISAT, CSM, SOE and JMU Facilities Management that provides opportunities for ISAT students to study advanced transportation technologies and gain hands-on experience in building, converting and adapting vehicles that run on renewable and alternative fuels
- **Cross-college departments and disciplines involved:**
  - Mechanical Engineering
  - Electrical Engineering
  - Material Science
  - Integrated Science and Technology
  - Economics
  - Sociology
  - Business
  - JMU Facilities Management
- **University Contact:** Dr. Chris Bachmann, bachmacg@jmu.edu

Alternative Fuel Vehicle Lab

Science on a Sphere

- A facility that permits the researcher the opportunity to present Earth from an astronaut's perspective in space.
- The conventional objective of SOS is an educational tool to expose the audience to issues and fundamentals of science. Accordingly, SOS comes with dozens of "movies" and images depicting environmental processes of Earth, such as global climate effects and changes in land formations.
- **Cross-college departments and disciplines involved:**
  - **Meteorology**
  - **Environmental Science**
  - **Earth Sciences**
- **University Contact:** sphere@jmu.edu


NOAA
SCIENCE on a SPHERE

Edith J. Carrier Arboretum

- The Arboretum provides an ideal combination of botanical gardens and natural forest, each complementing the other and serving the purpose of research, teaching and demonstration.
- The complex serves as an outdoor biology laboratory as well as an environmental center for this region.
- **Cross-college departments and disciplines involved:**
  - Biology
  - Kinesiology
  - Geographic Information Systems
  - Education
  - Art
  - Music
- **University Contact:** Jan Mahon, mahonjs@jmu.edu

Edith J. Carrier Arboretum

Frances Plecker Education Center

Energy Lab

- Devoted to upper level "hands-on" experiences and senior project work for students studying energy.
- The lab is used to study both conventional and alternative (solar and wind) energy production, as well as methods for improving the energy efficiency of heating, ventilation and air conditioning equipment.
- **Disciplines Utilized:**
  - **Integrated Science and Technology**
  - **Engineering**
  - **Physics**
- **University Contact:** Dr. Tony Chen, chendt@jmu.edu

Energy Lab

Biosciences Building (2012)

A new 90,000-SF academic building to house biological science departments.

In addition to classroom and teaching laboratories, the building includes faculty offices, tutorial rooms for student-student and student-faculty collaboration, lecture rooms, computer labs, seminar rooms, common spaces for informal gathering, study, etc., and related support spaces. The program also includes an animal care facility and research greenhouse.

Biosciences Building (2012)

Contacts

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