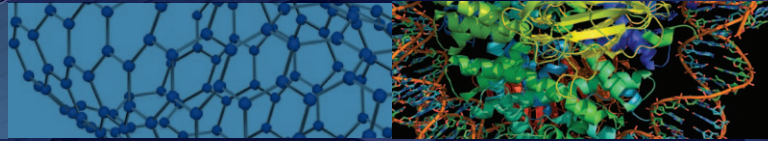




M I L L E N N I U M S C I E N C E C O M P L E X

MATERIALS RESEARCH
INSTITUTE



THE HUCK INSTITUTES
OF THE LIFE SCIENCES



MATERIALS RESEARCH INSTITUTE

MRI provides leadership both at Penn State and in the materials community worldwide, coordinating materials-related activities, maintaining core and shared facilities, training students, and fostering collegial exchanges of expertise. The high concentration of science and engineering faculty engaged in materials research facilitates the formation of cohesive teams to meet challenging research goals that require interdisciplinary approaches and vertical integration. The ultimate goal is the creation of new knowledge and the transfer of materials technology to industry and government.

Created in 1992 as a University-wide institute to facilitate research across departmental and College boundaries, MRI merged with the Materials Research Laboratory in 2001.

Today, teams of MRI faculty from across the campus combine their expertise in materials science, chemistry, biology, engineering, physics, and advanced computation to understand and control the properties of matter,

the fabrication of devices, and the performance of engineering systems.

MRI is centralizing its core user facilities in the MSC. The Materials Characterization Laboratory is a state-of-the-art facility for the synthesis, measurement, and characterization of traditional and advanced material. The Penn State Nanofabrication Facility (Nanofab) is a founding member of the National Nanotechnology Infrastructure Network (NNIN), and provides an array of sophisticated instruments for micro- and nano-fabrication.

MRI FACTS:

- 5 colleges represented
- 15 science and engineering departments represented
- 245 faculty members (and their ~1000 graduate students and post-docs)
- 60-plus visiting scientists and research associates
- 26 technical staff
- #1 ranking in annual materials research expenditures (NSF)

MILLENNIUM SCIENCE COMPLEX

THE CONVERGENCE OF MATERIALS SCIENCE AND THE LIFE SCIENCES

The convergence of engineering, physical science, and life sciences, augmented by high-speed computation and data search, is opening new frontiers in human health, energy, and materials science. At Penn State, this convergence has a new home in the Millennium Science Complex, a 297,000-square-foot science building housing two of the University's premier research organizations – the Materials Research Institute and The Huck Institutes of the Life Sciences.

More than just a collection of laboratories and instruments, the MSC embodies a new style of research, in which experts from many disciplines coordinate their technologies and knowledge in ways that produce exponential advances. By providing the research space and the opportunity for intellectual exchanges, both formal and informal, the MSC is expected to generate large returns on the University's investment in the Institutes and this new infrastructure.

Designed by internationally renowned architect Rafael Viñoly, the MSC is one of a small handful of buildings specifically constructed to support the integration of the physical and life sciences. Shared meeting and common areas are designed to encourage discussion and the free exchange of ideas. Instruments for the nano- and micro-scale characterization of organic and inorganic materials will be co-located in an underground vibration-free quiet space, while in the shared labs and computational centers located on the above-ground levels, materials researchers, engineers, and life scientists will collaborate in solving problems of complex size and scale by bringing elements together from across their respective fields in novel interdisciplinary approaches.

The next great field of transformative research lies at the boundaries of the life sciences and physical science and engineering, and the state-of-the-art multidisciplinary facilities within the Millennium Science Complex represent a vision of advancing the convergence of these fields by facilitating a culture of collaboration that will contribute to revolutionary advances in human health and well-being.

RESEARCH TOPICS WITHIN THE MSC:

- Biomaterials and Biomedical Devices
- Biophotonics
- Electronic Materials and Devices
- Functional Polymers
- Immunology
- Infectious Diseases
- Microbiology
- Nanomaterials
- Neural-engineering
- Surfaces and Thin Films

INDUSTRIAL RELATIONS: The MSC user facilities are open to industry researchers, and technical staff are available to offer advice, assistance, and training. In addition to providing hands-on training to the next generation of scientists, the MSC is designed to support industry and provide economic and technological benefits to the commonwealth and nation.

EDUCATION: Undergraduate and graduate education is central to the mission of both Huck Institutes and MRI. The MSC is designed to be a vibrant facility for hands-on student learning in an interdisciplinary laboratory setting. The MSC will be a place for students and faculty from across campus to share laboratories, state-of-the-art instrumentation, and an atmosphere of collaboration.

THE HUCK INSTITUTES OF THE LIFE SCIENCES

The Huck Institutes of the Life Sciences are a coalition of research institutes facilitating excellence in interdisciplinary life science research and education at Penn State.

By developing and funding cutting-edge shared research facilities, innovative graduate programs, and professional training opportunities, the Huck Institutes aim to produce the next generation of world-leading scientists – integrating research in the physical and biological sciences and engineering, and fostering a culture of communication between disciplines that encourages novelty, collaboration, and data sharing to solve societal issues of food, health, and the environment.

Hosting nationally and internationally renowned faculty specializing in genomics, infectious disease, plant science, neuroscience, and molecular toxicology, the Huck Institutes offer an unparalleled wealth of knowledge and expertise across the life sciences.

The Huck Institutes also have established connections with Penn State's Social Science Research Institute, Institute for CyberScience, Materials Research Institute, and Institutes of Energy and the Environment, and support shared technology facilities at the University Park campus and the College of Medicine in Hershey – providing a wide range of instrumentation and technical expertise to support researchers from Penn State and beyond.

HUCK INSTITUTES FACTS:

- 476 faculty members
- 106 co-funded faculty
- 360 graduate students and post-doctoral researchers
- 22 technical staff
- 11 colleges represented
- 50 departments represented
- 6 research facilities



ABOUT THE MSC

The Millennium Science Complex is a 297,000-square-foot research building designed by internationally renowned architect Rafael Viñoly. Its signature architectural feature is the 150-foot cantilever and light well that overhang a plaza below. The design of the cantilever and garden plaza help shield ultrasensitive instruments from vibrations. This quiet space is structurally isolated from the rest of the building and situated on 24-inch-thick slabs on grade at the intersection of the two wings to meet strict vibration-free criteria. State-of-the-art characterization and fabrication tools are housed in the quiet space below the garden, shielded from acoustic and electromagnetic noise.



LOW ENERGY AND LEED DESIGN

The MSC is designed with energy efficiency and green technologies in mind.

These include:

- 60,000 square feet of green roof
- Storm water recycling
- Heat recovery wheels to recycle air and absorb energy
- Deep-set windows with etched glass to reduce heat in summer and admit light in winter

Plus, the front lawn is graded and planted to create a recreation field space for students

RESEARCH FEATURES

- 40,000 sq. ft. quiet labs shielded from vibration and electromagnetism
- 10,000 sq. ft. clean rooms for nano/micro-fabrication (class 1000/100)
- 30 bio-safety cabinets
- 66 fume hoods
- 23 conference rooms
- 2,800 sq. ft. commons area on 3rd floor
- 800 sq. ft. commons in basement

CONTACT MRI:

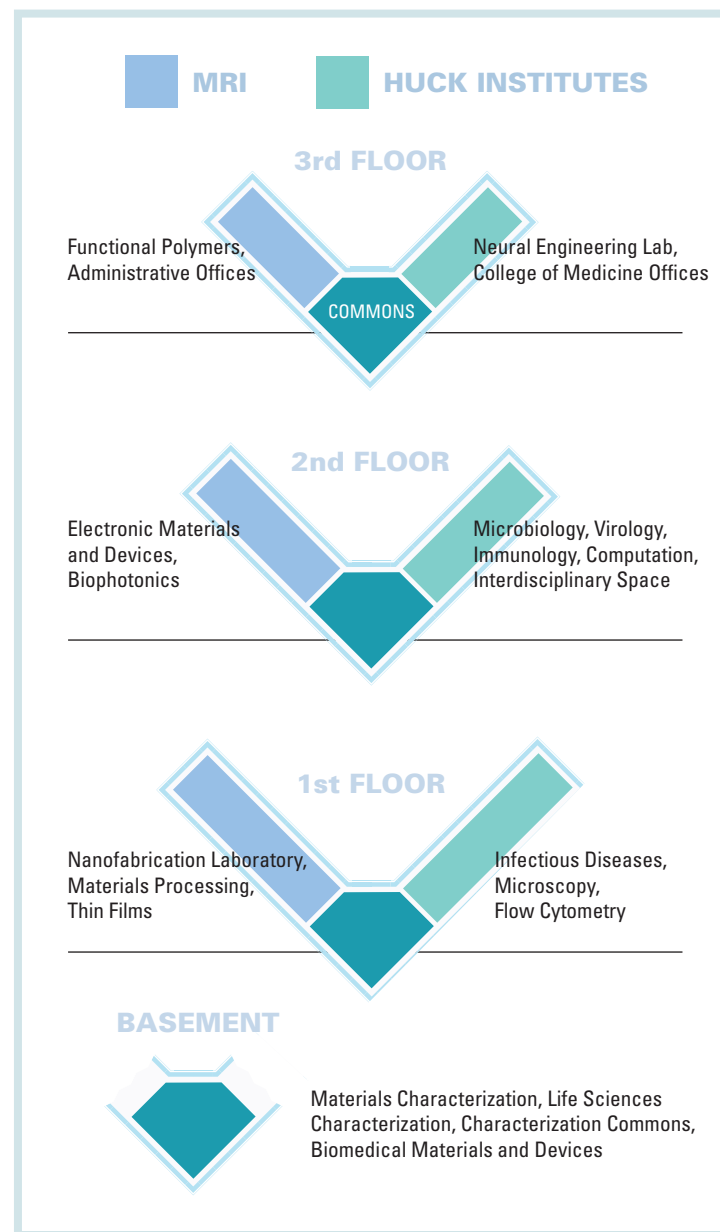
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