

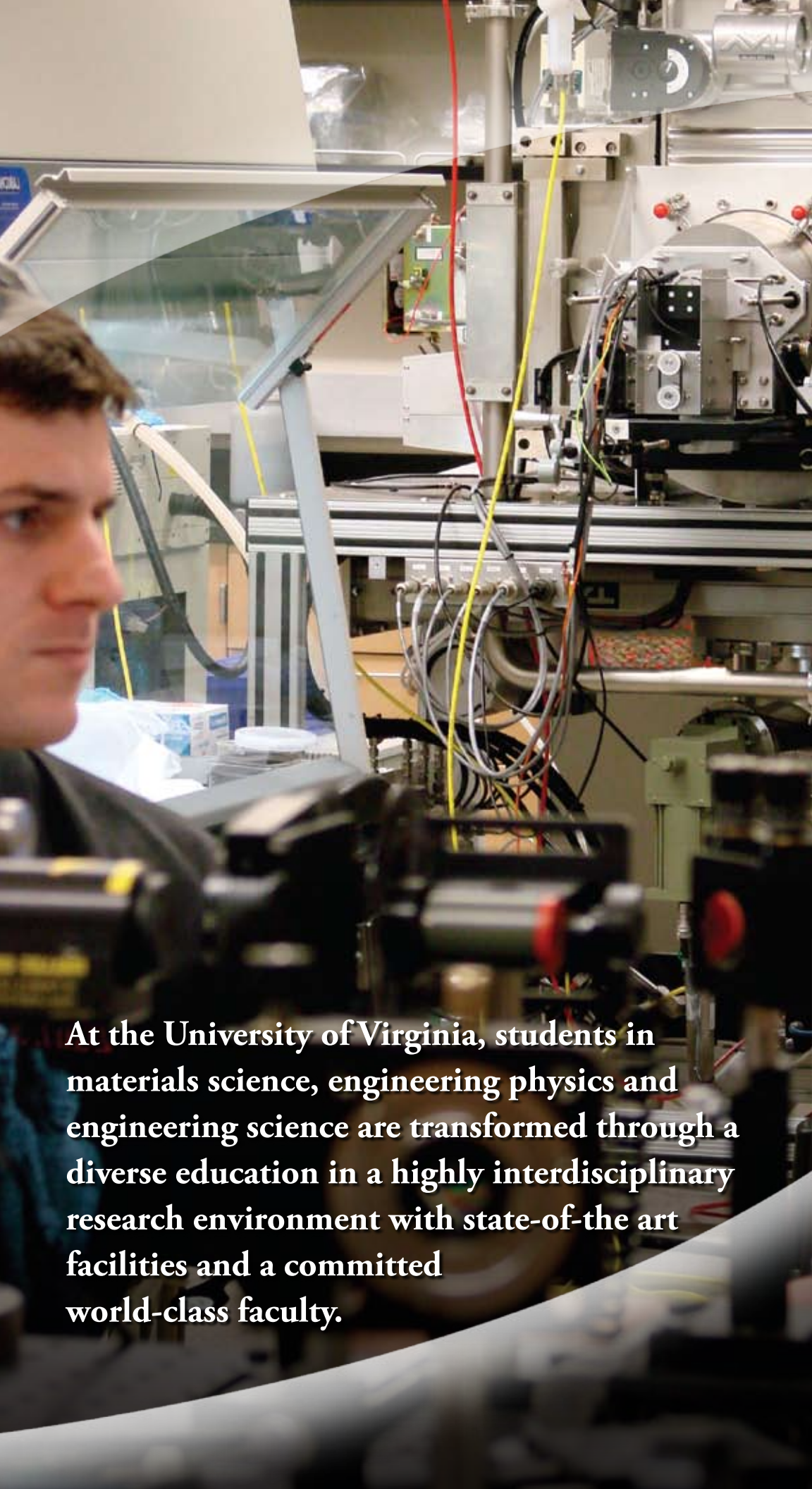
Department of

# Materials Science & Engineering



*Developing*  
**Leaders of  
Innovation**





**At the University of Virginia, students in materials science, engineering physics and engineering science are transformed through a diverse education in a highly interdisciplinary research environment with state-of-the art facilities and a committed world-class faculty.**

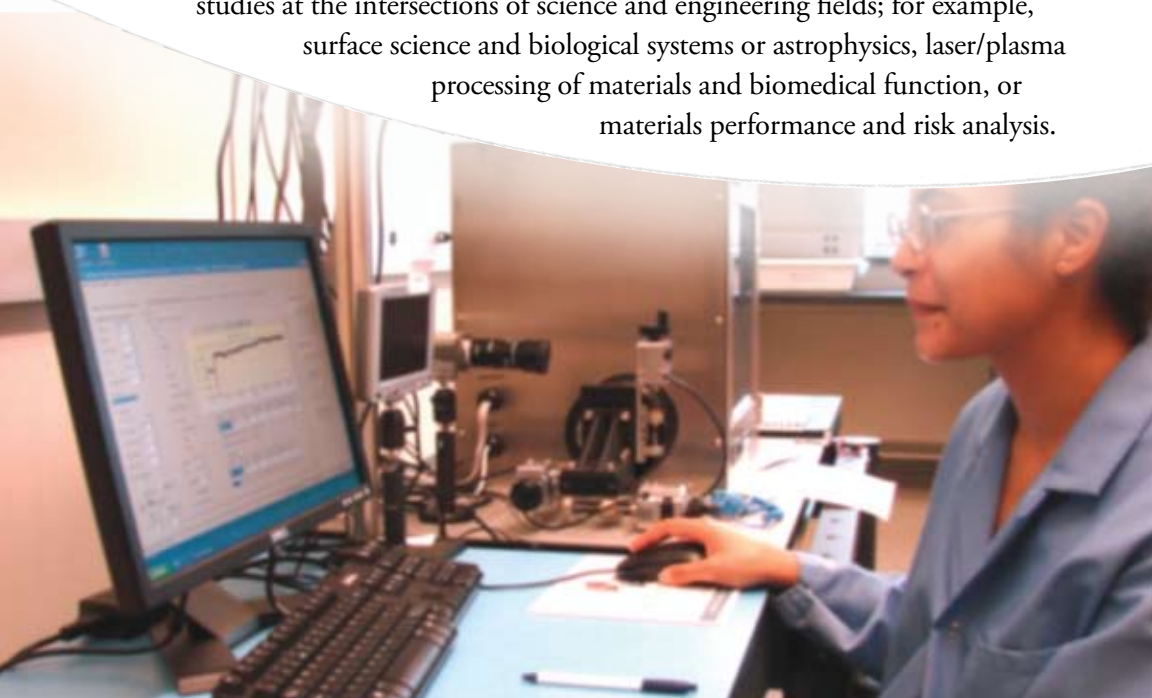
# Our Students

The mission of the MSE Department is to provide undergraduate and graduate students with the highest-quality instruction within a research environment that continually produces new knowledge. Our students learn to solve critical materials problems by integrating traditional MSE knowledge and skills with a strong foundation in mathematics, chemistry and physics, as well as cross-disciplinary pursuits in major engineering disciplines.

Our undergraduates choose to **tackle compelling issues** in materials science and engineering or engineering science. These programs offer a customized interdisciplinary curriculum with the option of emphasizing emerging areas of engineering, fundamental sciences, pre-professional preparation (law, medicine, business) or an intense focus on materials and nanomedicine. The engineering thesis and additional **hands-on projects** allow students to engage in sponsored research that brings class studies to life and which provide a variety of career paths.

Our graduate students — whose backgrounds include metallurgy, polymer science, chemistry, physics, ceramics and mathematics and most branches of engineering — have equally varied interests, allowing students and faculty alike to solve research problems with the aid of many **unique and innovative perspectives**. Our graduates currently work for some of the most highly regarded industrial science laboratories (e.g., Alcoa, Boeing, IBM, GE and Lucent Technologies), government laboratories (e.g., Bettis, Los Alamos, NASA, the National Institute of Standards and Technologies, the Nuclear Regulatory Commission, Oak Ridge, Sandia, the U.S. Army, the U.S. Navy) and universities (Michigan Tech, The Ohio State University, the U.S. Naval Academy, the University of South Carolina and the University of Southern California).

Graduate students in the engineering physics degree program experience either strong integration of materials science with physics of solids or customized curricula for studies at the intersections of science and engineering fields; for example, surface science and biological systems or astrophysics, laser/plasma processing of materials and biomedical function, or materials performance and risk analysis.

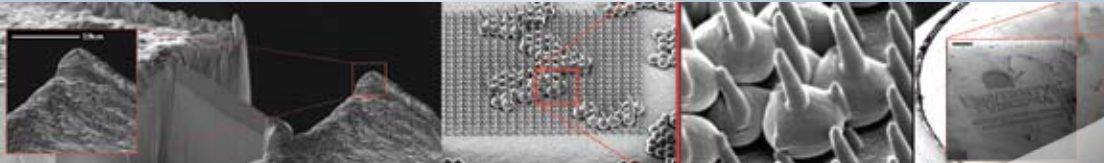


# Our Research

At the U.Va. MSE Department, our students and faculty collaborate with experts in industry and government as well as those across the University's Grounds. Research focuses on materials for structural, electronic, optical and magnetic functions, enabled by faculty expertise in mathematics, chemistry, and physics of solids.

Internationally recognized areas of research include:

**amorphous, nanocrystalline and multi-functional high-performance metals; astrophysics and space sciences; computational materials science; fatigue and fracture; electrochemistry and corrosion; magnetism; microscopy and spectroscopy with electrons, ions and X-rays; phase transformations, thermodynamics and kinetics; and surface and interface science**



The MSE Department houses six **interdisciplinary centers for excellence** — the Center for Electrochemical Science and Engineering, the Intelligent Processing of Materials Laboratory, the Light Metals Center, the Nanoscale Materials Characterization Facility, the Laboratory for Atomic and Surface Physics and the Center for Computational Materials. Sponsors of our research include Alcoa, DARPA, GE, GM, IBM, Lockheed Martin, Micron Technology, NASA, NSF, the U.S. Air Force, the U.S. Department of Energy, the U.S. Office of Naval Research, VDOT and others.

Opened in 2006, Wilsdorf Hall enables advanced research in nanoscale materials research and more. The highly collaborative facility features a controlled environment for next-generation instruments to probe material structure and composition at the atomic level, a computational center for computer-based modeling and simulation, and upgraded office and laboratory space for faculty and graduate students.

# Materials Science & Engineering at U.Va.

Materials science and engineering — or the development of new materials, new manufacturing processes for materials and new strategies for their safe use in severe environments — is an **integrative discipline with far-reaching impact**.

Responding to important challenges such as safety, durability and system performance, materials scientists develop the metals, polymers, ceramics and semiconductors used in transportation infrastructure and vehicles, computers and communications devices, energy conversion systems, medical implements and countless other objects upon which we rely each day.

The U.Va. Department of Materials Science and Engineering (MSE), established in 1962, is addressing these contemporary societal needs by **providing cutting-edge research solutions** and **educating the leaders of tomorrow** — in the classroom, in the lab and beyond. Highly collaborative in nature, the department offers a Bachelor of Science degree in engineering science emphasizing interdisciplinary study and offering a strong concentration in materials science; Master of Science and Ph.D. degrees in materials science and engineering; a Master of Materials Science and Engineering degree; and Master of Engineering, Master of Science and Ph.D. degrees in engineering physics. The MSE Department also offers a minor in materials science, available to all University undergraduate students.

## Snapshot

The U.Va. Department of Materials Science and Engineering ...

- Consistently ranks among the top 25 percent of all MSE departments nationally
- Enables undergraduates from across the University to earn a minor in MSE, participate in sponsored research or pursue a customized degree in engineering science
- Supports 100 graduate students each year who are deeply involved in research, journal publication and international technical conferences
- Is led by 19 nationally renowned professors, including three members of the National Academy of Engineering, 10 endowed chair-holders and 30 recipients of Fellow-of-technical-society awards
- Receives \$9 million in research funding per year
- Operates sophisticated laboratory instrumentation and computer modeling facilities in two attached state-of-the-art buildings, Wilsdorf Hall (opened in 2006) and the Materials Science Building (1986)
- Is home to six major research centers of excellence



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