Optical Science and Technology Center

Director
• Michael E. Flatte (Physics and Astronomy)

Faculty: https://ostc.uiowa.edu/members
Website: https://ostc.uiowa.edu/

The Optical Science and Technology Center consists of faculty members from the Departments of Chemical and Biochemical Engineering, Civil and Environmental Engineering, and Electrical and Computer Engineering (College of Engineering), and the Departments of Biology, Chemistry, and Physics and Astronomy (College of Liberal Arts and Sciences). Among the faculty are distinguished scientists who have developed international reputations for innovative research on the frontiers of optical science and engineering. Funding to support research in the Center comes from a variety of federal, state, and private sources, including the National Science Foundation (NSF), the National Aeronautics and Space Administration (NASA), the Office of Naval Research (ONR), the National Institutes of Health (NIH), and the ACS Petroleum Research Fund.

Current research areas include laser spectroscopy and photochemistry, photonics and optoelectronics, ultrafast laser development, condensed matter physics, materials growth techniques, device physics/engineering, surface chemistry, chemical sensors, environmental chemistry, polymer science, plasma physics, and nonlinear optics.

Much of the research is housed in the modern Iowa Advanced Technology Laboratories. The laboratories in this environmentally-controlled building are devoted primarily to research in areas of optical science and technology. These world-class research laboratories offer state-of-the-art equipment including a variety of novel laser systems (such as widely tunable, ultrafast lasers), materials growth and characterization facilities, optoelectronics device fabrication and characterization, UHV surface science laboratories, and supersonic molecular beam time-of-flight mass spectrometer systems. Scientists also have access to University and department diagnostic support facilities, including nuclear magnetic resonance, mass spectrometry, Fourier transform infrared spectroscopy, X-ray diffraction, and electron microscopy.

Courses

Optical Science and Technology Center Course

OSTC:3750 Fundamentals of Micro and Nanofabrication 3 s.h.
Fundamentals of micro- and nano-fabrication processes; physical principles of photo and electron beam lithography, alternative nano-lithography techniques, thin film deposition, molecular beam epitaxy, atomic layer deposition, self-assembly; metrology methods; physical and chemical processes of wet and plasma etching; cleanroom science, operations, safety protocols; sequential micro- and nano-fabrication processes involved in manufacture of semiconductor, photonic, nanoscale devices; imaging and characterization of micro- and nano-structures; scientific and technological applications of emerging micro- and nano-devices and systems. Prerequisites: BIOL:1141 or CHEM:1120 or PHYS:1612 or CHEM:1110 or CHEM:1060 or PHYS:1702 or PHYS:1611. Requirements: undergraduate lab course in chemistry, biology, physics, or engineering. Same as PHYS:3750.