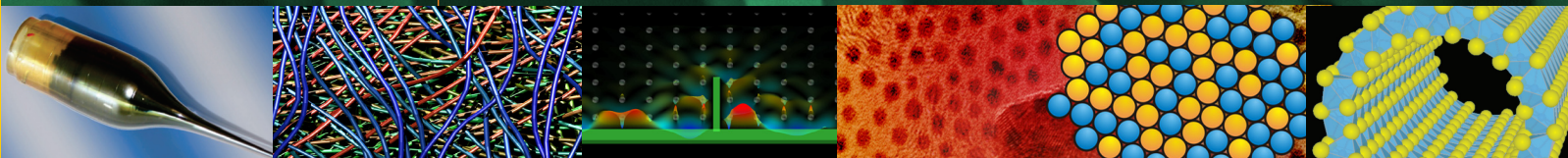




Massachusetts  
Institute of  
Technology

**The MIT Center for Materials Science and Engineering is devoted to exploring the design, creation, and fundamental understanding of materials that are capable of enhancing the human experience.**



Massachusetts Institute of Technology

**MIT's Center for Materials Science and Engineering (CMSE) seeks to bring together the large and diverse materials community at MIT in a manner that produces high impact science and engineering typically not realized through usual modes of operation.**

Our underlying mission is to enable the development and understanding of new materials, structures, and theories that can impact the current and future needs of society. We accomplish this through interdisciplinary fundamental research, shared experimental facilities, innovative educational outreach programs, and directed knowledge transfer.

CMSE also fosters collaborative research with industry, government

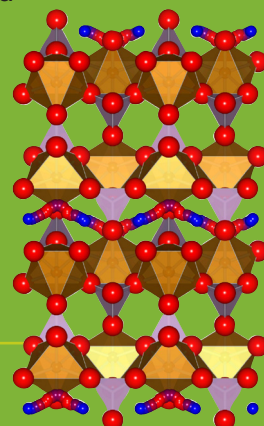
laboratories, and other universities, both national and international. Students and post-doctoral associates are trained in a highly interdisciplinary environment involving mentoring by multiple faculty members from different disciplines and departments. CMSE educational outreach programs encompass a broad range of activities and age levels.

## HIGHLIGHTS . . .



Fundamental research in photonic bandgap fibers enabled the creation of a new surgical tool that delivers laser radiation and saves lives.

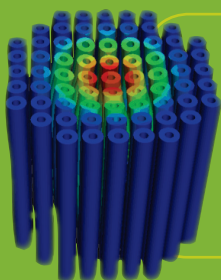
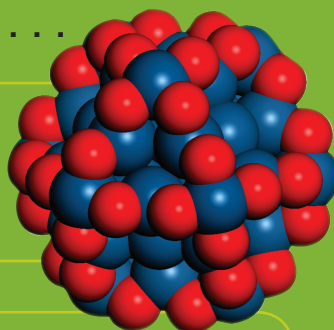
Computational calculations led to a modified lithium iron phosphate battery material with ultra-fast charging and discharging rates.



DIRECTOR: Michael Rubner  
<http://web.mit.edu/cmse>

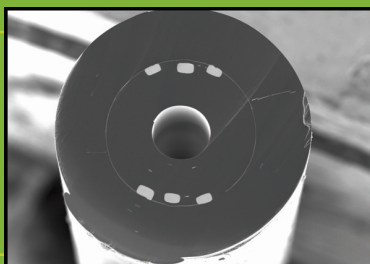
## RESEARCH FUNDAMENTALS . . .

Discovering and designing nanomaterials for enhanced electrochemical energy storage and power-delivery.



Developing a new class of dynamically tunable multicomponent heterogeneous nanostructured materials that are engineered to exhibit on-demand switchable mechanical properties.

Exploring the design, fabrication, characterization, and physical phenomena of a new class of multicomponent nanoscale fiber materials containing conductors, semiconductors, and insulators.



Our center interdisciplinary research seeks to address some of the emerging materials science and engineering challenges facing society, including energy, health, and environmental problems.

Our wide-ranging programs encompass integrated elements of theory, new materials synthesis, and nanoscale characterization and processing. //

Michael Rubner, Director  
CMSE



## CMSE EDUCATION, OUTREACH AND PARTNERSHIP ACTIVITIES...

CMSE engages participants in educational outreach programs designed for middle school students and teachers, undergraduates, and high-school students and teachers. Special programs target underrepresented groups in science, technology, engineering, and mathematics.

CMSE operates four shared experimental facilities: Materials Analysis, Crystal Growth and Preparation, Electron Microscopy, and X-Ray Diffraction. The equipment is widely used by the MIT materials community and by outside industrial, academic, and medical researchers. These facilities are also used to teach core undergraduate subjects.

# OUTREACH

More information about the workshops, internships, partnerships, and educational opportunities are available at:  
<http://web.mit.edu/cmse/educational/index.html>

