

CENTER FOR NANOSCALE MATERIALS

A premier user facility providing expertise, instruments, and infrastructure for interdisciplinary nanoscience and nanotechnology research.



The Center for Nanoscale Materials (CNM) is a premier user facility operating as one of the five centers built across the nation as part of the U.S. Department of Energy's (DOE's) Nanoscale Science Research Center program under the Office of Science.

Academic, industrial, and international researchers from across the globe can access the center through its user program. Brief proposals are peer-reviewed for both non-proprietary (at no cost to the user) and proprietary (with cost-recovery rates) research.

The center's goal is to discover new materials, visualize events with high resolution as they occur, understand the physics and chemistry of energetic processes at the nanoscale, and manipulate nanoscale interactions to synthesize and fabricate useful, energy efficient structures with new functionalities.

AREAS OF EXPERTISE

Nanofabrication & Devices (NFD)

Studies the fundamental science behind the development of micro- and nanoscale systems with the goal

of achieving unprecedented control in the fabrication, integration, and manipulation of nanostructures.

X-ray Microscopy Group (XMG)

Uses high resolution X-ray imaging to visualize and quantify novel nanoscale electronic, magnetic, and phonon phenomena in materials, particularly in embedded structures and systems under operando conditions. The group harnesses the high brightness of the Advanced Photon Source (APS), nanofocusing X-ray optics and imaging methods.

The Quantum and Energy Materials Group (QEM)

Designs and studies atomic-scale to mesoscale materials with implications for energy, the environment, and coherent information transfer and/or sensing. The group's research seeks

to design engineered quantum states down to single atoms, molecules, or defects.

The Nanophotonics and Biofunctional Structures (nPBS)

Studies optical processes at the extremes of time and space resolution to better understand and realize efficient energy transduction in nanostructures. The group also seeks to create novel biological assemblies for nature-inspired studies of energy conversion, coherent energy transport, and biosensing mechanisms.

The Electron Microscopy Center (EMC)

Develops new research capabilities that go beyond off-the-shelf technology in conjunction with the broadest scientific community that helps identify, define, and develop transmission and analytical electron microscopy needs to address the science of the future.

Theory and Modeling Group (TMG)

Works on large-scale molecular dynamics, high-level electronic structure theory, quantum and electrodynamics, multi-scale modeling and data science-based approaches to understand and predict a wide range of phenomena including nanoscale tribology, thermal and charge transport, and quantum entanglement in hybrid plasmonic systems.

CONTACT

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