



Center for Nanoscale Materials

Argonne's nanoscience & nanotechnology center

The Center for Nanoscale Materials (CNM) at Argonne National Laboratory is a premier user facility providing expertise, instruments, and infrastructure for interdisciplinary nanoscience and nanotechnology research. 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 support and explore ways to create functional hybrid nanomaterials and to tailor nanoscale interactions for grand challenges in energy and information conversion and transport, while furthering the U.S. Department of Energy (DOE) missions in energy generation, storage, and efficiency.

Areas of Expertise

Electronic & magnetic materials & devices

- ▶ Applies advanced techniques to take control of materials at the atomic and molecular scales and thereby paves the way for breakthroughs in new energy conversion and power-efficient energy technologies.

Nanobio interfaces

- ▶ Develops hybrid nanomaterials that are not found in nature, but are inspired by nature's principles, to provide better solutions for catalysis, solar energy conversion, energy storage, and even cancer therapies.

Nanofabrication & devices

- ▶ Advances the state of the art in nanofabrication and the fundamental science of nanoscale systems to achieve unprecedented control in the creation, integration, and manipulation of nanostructures that will form the foundation of functional nanoscale devices.

Electron microscopy center

- ▶ Develops and maintains unique capabilities for electron beam characterization. Applies those capabilities to solving materials challenges, with emphasis on the analysis of complex oxides and energy-related materials.



The Center for Nanoscale Materials is a premier user facility and operates as one of the five centers built across the nation as part of DOE's Nanoscale Science Research Center program under the Office of Science.

Nanophotonics

- ▶ Conducts research to predict, design, create, and characterize nanoscale optical materials, with a particular emphasis on energy flow in hybrid nanoparticle systems, such as a metal coupled with a semiconductor to form a hybrid nanostructure with completely new optical and electronic properties.

Theory & modeling

- ▶ Applies theoretical models to better understand molecular conversion and transport at nanoscale interfaces, the atomistic origins of the physical properties of nanoscale materials, and optical and plasmonic phenomena in nanoscale materials and devices.

X-ray microscopy

- ▶ Utilizes x-rays to image new materials and novel phenomena at the nanoscale, with particular emphasis on the use of the Hard X-ray Nanoprobe in the Advanced Photon Source to study the structure and characteristics of nanomaterials with embedded or buried features.