

## *Discovery | Innovation | Impact*



# NANOTECHNOLOGY

## DISCOVERY

Pacific Northwest National Laboratory (PNNL) is a recognized leader in nanoscience and nanotechnology discovery and has demonstrated the ability to rapidly translate these discoveries into solutions to address national challenges in energy, the environment, and national and homeland security.

## INNOVATION

Our multidisciplinary teams include:

- ▶ *Scientific and technological leaders in the development, characterization, and application of novel nanomaterials*
- ▶ *Human health effects and nanotoxicology*
- ▶ *Environmental exposure and risk assessment, including environmental fate and transport*
- ▶ *Development of science-based policy for the regulation and control of engineered nanomaterials and nanotechnology.*

Our state-of-the-art facilities and instrumentation for nanomaterials characterization include the EMSL—the Environmental Molecular Sciences Laboratory—a Department of Energy (DOE) national scientific user facility located at PNNL, that provides integrated experimental and computational resources for discovery and technological innovation in the environmental molecular sciences to support the needs of the DOE and the nation.

## IMPACT

With our regional partners—the University of Washington Center for Nanotechnology, University of Oregon Materials Science Institute, the Oregon Nanoscience and Microtechnologies Institute, and the Washington Technology Center—and drawing upon our own core capabilities in chemical and molecular sciences, applied materials science, and engineering we have created new materials with tailored properties and improved functionalities, and incorporated these materials into new devices and systems.



## ▶ ABOUT PNNL



Ohio-based Battelle has operated PNNL for DOE and its predecessors since 1965.

*For more information on the following, please visit us online:*

PNNL:  
<http://www.pnl.gov>

PNNL Nanoscience:  
<http://www.pnl.gov/nano>



EMSL:  
<http://www.emsl.pnl.gov>

By precisely manipulating atoms and molecules—the very building blocks of nature—our research will yield safe, just-in-time sources of hydrogen for a wide range of energy applications, new instruments to observe chemical processes in living cells, and miniaturized sensors to detect pathogens in foods and the environment.

We are committed to scientific discovery and innovation, and to moving our discoveries into the market place—putting nanotechnology to work for the benefit of humanity.

## FAST FACTS

- ▶ Year Established: 1965
- ▶ Management and Operations Contractor: **Battelle**
- ▶ Staff: **Nearly 5,000 staff members**
- ▶ Annual Budget: **\$1.1 billion**
- ▶ Publications: **More than 930 peer-reviewed publications annually**
- ▶ R&D 100 Awards: **PNNL has received 85 since 1969**
- ▶ Federal Laboratory Consortium (FLC) Awards: **71 honors**
- ▶ Patents: **Since 1965, PNNL has received a total of 1,761 U.S. and foreign patents.**

## FACILITIES

- ▶ **Environmental Molecular Sciences Laboratory (EMSL)**, a Department of Energy national scientific-user facility
- ▶ **Bioproducts, Sciences and Engineering Laboratory (BSEL)** in partnership with Washington State University
- ▶ **Electricity Infrastructure Operations Center (EIOC)** brings together industry-leading software, real-time grid data, and advanced computation into a fully capable control room at PNNL
- ▶ **Marine Research Operations Facility** is located at Sequim Bay on Washington state's northwest coast
- ▶ **Applied Process Engineering Laboratory (APEL)**, a research, development and demonstration user facility and technology business incubator
- ▶ **Radiochemical Processing Laboratory** for nuclear science and engineering.

### Pacific Northwest National Laboratory

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