![Pacific Northwest National Laboratory logo]

PHYSICAL & COMPUTATIONAL SCIENCES

Pacific Northwest National Laboratory (PNNL) is advancing the frontiers of discovery science, laying foundations for new technologies in support of Department of Energy (DOE) missions in science, energy, environment, and national security.

CHEMISTRY & MATERIALS SCIENCE

PNNL has significant expertise in catalysis, chemical physics, computational chemistry, geochemistry, heavy element chemistry, physical biosciences, and separations. Our strengths in materials sciences include atomically precise synthesis and in situ characterization of nanomaterials, quantum materials, hierarchical materials, and materials for energy storage.

ADVANCED COMPUTING & DATA SCIENCES

Our research advances emerging computing technologies, including quantum information systems. We are designing new data analysis and visualization tools, developing artificial intelligence and machine learning algorithms, and optimizing system performance and energy efficiency.

ISOTOPE PROGRAM

The Isotope Program at PNNL receives funding from the DOE Isotope Research & Development and Production Program. The Isotope Program supports scientific advances in the production and use of radioisotopes for research, medicine, and industrial applications.

PNNL BY THE NUMBERS (2024 DATA)
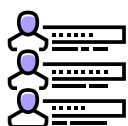
6,088
Number of Staff

1,980
Peer-Reviewed Publications

75
U.S. & Foreign Patents

Where great minds meet great challenges.

Researchers at PNNL are tackling some of the world's greatest science and technology challenges in support of the DOE Office of Science.

SIGNATURE FACILITIES

PNNL is home to unique research facilities at the heart of efforts to discover new knowledge and develop technologies addressing national energy, environmental, and security needs.

Energy Sciences Center

This $90-million facility unites PNNL's capabilities in chemistry, materials science, and quantum computing to foster collaboration, drive innovation, and support the U.S. in maintaining global scientific and technological leadership in decarbonization and next-generation energy materials.

Center for Advanced Technology Evaluation

CENATE is a unique computing proving ground focused on integrated evaluation of early-stage technologies to predict their performance, detect potential shortcomings, and guide system design.

Institute for Integrated Catalysis

The IIC explores and develops the chemistry and technology of catalyzed processes that enable a carbon-neutral future.


Computational and Theoretical Chemistry Institute

The CTCI promotes fundamental computational chemistry research to address scientific grand challenges in energy and the environment.

ENERGY FRONTIER AND EARTHSHOT RESEARCH CENTERS

PNNL has leading roles in DOE Energy Frontier and Energy Earthshot™ Research Centers. These bring together creative, multi-disciplinary teams from research institutions nationwide to tackle tough fundamental scientific challenges that hinder advances in energy technologies. The Research Centers leverage powerful new tools for characterizing, understanding, modeling, and, for the Physical and Computational Sciences, manipulating matter across scales. They also play a critical role in training the next-generation energy science workforce by attracting talented students and postdoctoral researchers.
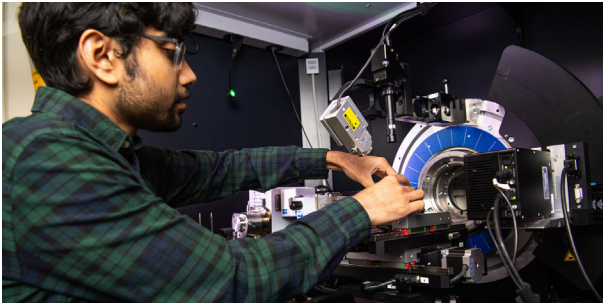

Center for Understanding Subsurface Signals and Permeability

The CUSSP aims to make enhanced geothermal systems a widely accessible and reliable source of renewable energy.

Interfacial Dynamics in Radioactive Environments and Materials

IDREAM conducts fundamental science to support innovations in retrieving and processing high-level radioactive waste.
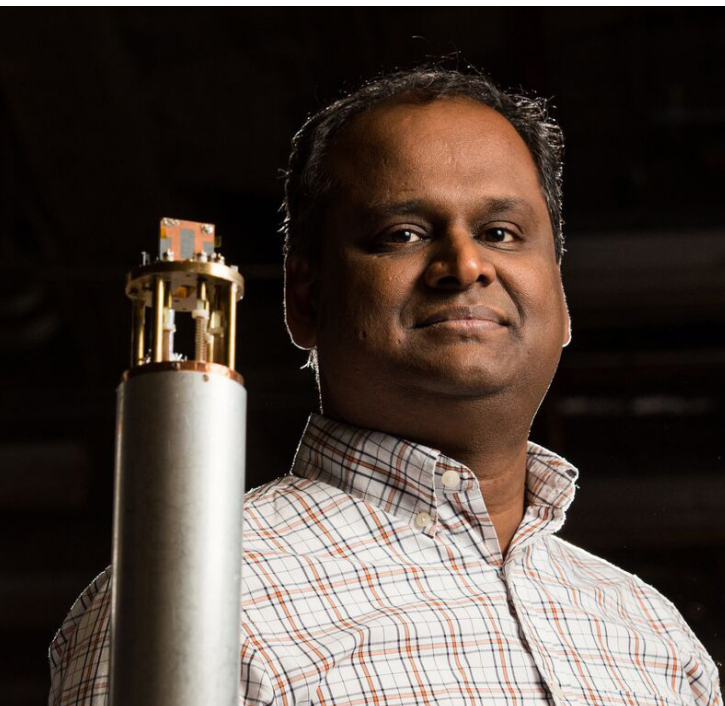
ENERGY INNOVATION HUBS

DOE's multi-institutional, interdisciplinary Energy Innovation Hubs combine basic and applied research with engineering to accelerate scientific discovery and address critical energy issues. DOE's five Energy Innovation Hubs, founded in 2010, are modeled on the approach to science management exemplified by the Manhattan Project and AT&T's legendary Bell Laboratories.

CAPABILITIES

PNNL's staff and partners develop unique scientific instrumentation, methods and models and use complementary techniques to understand molecular level processes underlying complex processes in multiphase systems.

Scientific Discovery with Global Impact.

Major Initiatives of the Physical and Computational Sciences at PNNL:
Strategic investments to push scientific frontiers.

CATALYSIS FOR RENEWABLE CARBON AND HYDROGEN

Designing and synthesizing new catalysts and energy storage materials to help close the carbon cycle.

SCALABLE MACHINE REASONING FOR SCIENTIFIC DISCOVERY

Advancing computing and artificial intelligence to enable scientific discovery to accelerate autonomous science.

AUTONOMOUS SCIENCE

A generalizable framework of "right" level autonomy solutions to accelerate discovery in physical and life sciences.

THE QUANTUM WORLD

Simulating chemicals and materials with greater accuracy and improving quantum device performance through advances in new materials systems.

SEPARATIONS SCIENCE

Enabling energy efficient separations by providing the foundational fundamental science.

Learn more: **pnnl.gov**

Explore Job Opportunities: **www.jobs.pnnl.gov**

PNNL BY THE NUMBERS (2024 DATA)

1
R&D100 & Federal Lab Consortium Awards

$1.495B
Annual Budget

1,870+
Active Science & Technology Projects