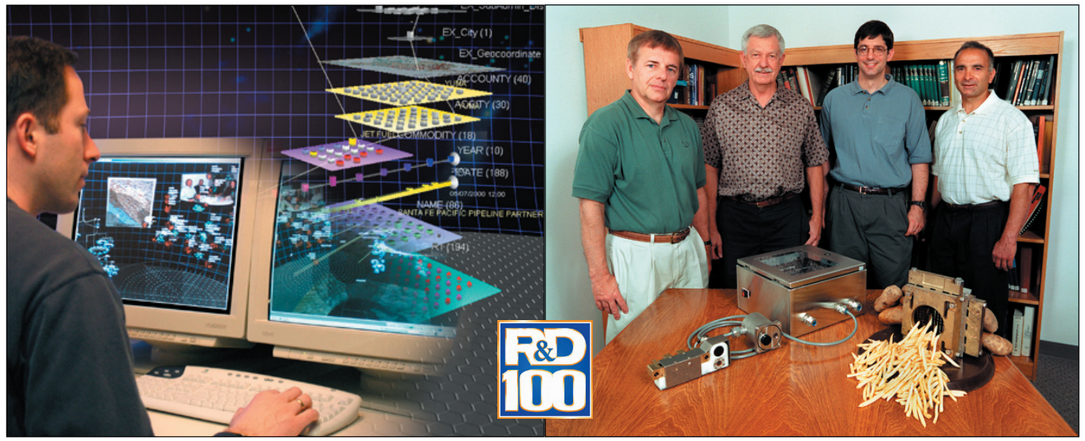

PNNL partners with Northwest industry. Boeing engineers helped create PNNL's Starlight, an advanced information analysis system now used by government and industry. Lamb Weston used PNNL's technology assistance program to begin development of a sensor that reduces waste in potato processing. Both technologies received awards for innovation and technology transfer.

Promoting Economic Development

A healthy business environment is essential to the future of the Northwest. Since 1995, PNNL has helped create, recruit and expand over 80 southeast Washington firms. More than 540 free technology assistance projects, involving nearly 22,000 hours of work by PNNL staff, have helped over 345 technology businesses throughout the Northwest. Firms have used this annual program to get started, establish new product lines or improve operations.

To move innovations into the marketplace, PNNL has more than 200 active licenses in place for patented or copyrighted technologies developed at the laboratory. Since 1999, about one-third of those licenses have gone to Northwest firms. PNNL also is a founding sponsor of the Applied Process Engineering Laboratory, an Eastern Washington technology business startup center.

To foster a technology-oriented entrepreneurial workforce, PNNL has established relationships with two Northwest universities and is working with a third to develop collaborative technology entrepreneurship programs.

Current entrepreneurs regularly benefit from business forums sponsored by the laboratory and from the relationships we maintain with investor and technology groups throughout the region.

To enhance quality of life in communities surrounding the laboratory, PNNL staff donated over 9,000 hours to 63 community projects in 2003, and Battelle contributed more than $791,000 to Northwest civic and philanthropic groups.

Planning for the Future

Addressing extraordinary research challenges of the 21st century and strengthening science and technology leadership roles in the Pacific Northwest are among PNNL's goals for its "Research Campus of the Future." Our vision is to continue to deliver quality science and technology while building new facilities to address emerging research areas. Focuses will include conversion of agricultural waste into viable products; the study of biological systems critical to understanding life processes; and the exploration of proteins to identify methods for cleaning contaminated sites, reducing global warming, supporting new energy sources and approaches, and detecting and treating diseases.

For more information, contact:

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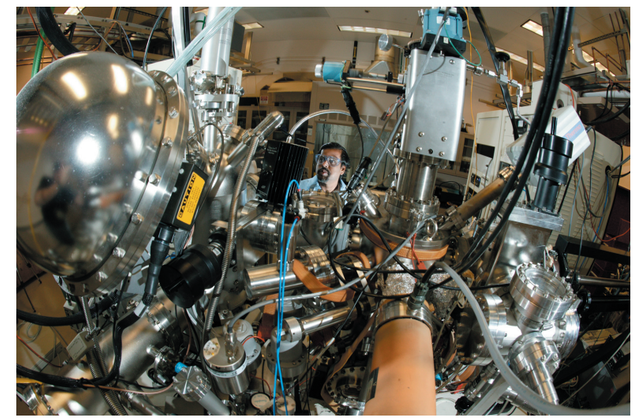
Pacific Northwest National Laboratory

A Regional Perspective

Pacific Northwest National Laboratory is a U.S. Department of Energy Office of Science laboratory. Our researchers advance the fundamental understanding of complex chemical, physical and biological systems and provide science-based solutions to critical challenges in national security, energy and the environment.



Researchers have access to PNNL-developed instruments such as this molecular beam epitaxy system, used to create nanostructured materials for applications in advanced semiconductor and solid oxide fuel cell devices.

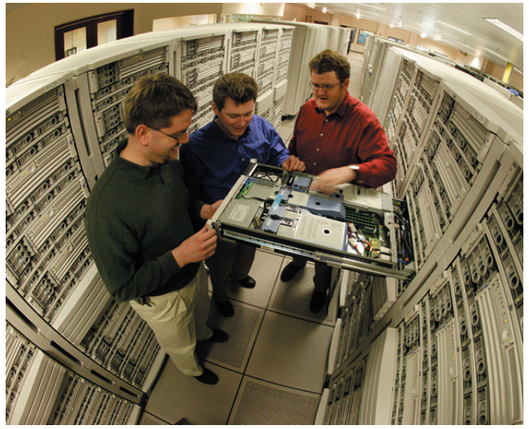
PNNL also is one of the premier research and development institutions in the Pacific Northwest and a major force in the growth of science and technology innovation, collaboration and education.

The laboratory's 3,900 researchers and staff are located at the main campus in Richland, Wash., the Sequim Marine Research Operations in Sequim, Wash., and at offices in Seattle, Wash., Portland, Ore., and Washington, D.C. Battelle, a global science and technology enterprise headquartered in Columbus, Ohio, manages PNNL for DOE.

The annual business volume of the laboratory is approximately $600 million, primarily for research and development for DOE missions. About 20 percent of this business comes from other federal agencies, such as the departments of Defense, Homeland Security, Health and Human Services and Transportation, and the Environmental Protection Agency, as well as state agencies and industry.

Office of Science

Researchers from outside PNNL conduct work at the laboratory, either remotely or on site. During 2003, the William R. Wiley Environmental Molecular Sciences Laboratory (EMSL), a premier DOE user facility located at PNNL, hosted approximately 1,500 scientists, 331 of whom were Northwest academic and industrial researchers. Resources at EMSL include the National Proteomics Research Resource Center, a 900-megahertz wide-bore nuclear magnetic resonance spectrometer and one of the world's fastest supercomputers.



Northwest scientists in academia and industry have access to one of the world's most powerful supercomputers at the William R. Wiley Environmental Molecular Sciences Laboratory.

Addressing Northwest Priorities

In addition to national and international projects, PNNL is helping to resolve some of the Northwest's most difficult energy, transportation, homeland security and ecological issues. For example, our researchers lead more than 25 projects that address fish and water issues, including many involving salmon habitat, migration and survival in the Northwest.

Computer models developed at PNNL are revealing the influence of climate change in the region, while technologies developed for the Hanford Site cleanup are being applied to other Northwest needs.

Scientists at the Sequim MRO not only are increasing the understanding of ocean environments, they are uniquely qualified to address coastal and near-shore security issues.

We also are working with Washington State to solve environmental and natural resource problems in local highway systems and Puget Sound, and with King County, Wash., to craft new approaches to planning and resource management.

On a broader scale, PNNL and the Idaho National Engineering and Environmental Laboratory (INEEL) are partnering with regional universities on the Integrated Natural Resource Management Initiative to help decision makers balance potential outcomes and tradeoffs of resource management decisions.

The Northwest Energy Technology Collaborative unites the laboratory, academia, and industry in a similar alliance to establish the Northwest as a leader in research, education and product development for energy technology markets worldwide.

Building University Partnerships

PNNL collaborates with faculty and students at colleges and universities throughout the Northwest—from individual projects to formal joint research institutes and support for teaching programs. All promote scientific discovery, provide educational opportunities and gather the best talent to tackle priority issues of DOE and the region.

Our university partnerships include:

- Cell Systems Institute, the Joint Institute for Nanoscience and Nanotechnology and the Joint Institute for Global and Regional Studies with the University of Washington
- Program in functional genomics, Oregon Health and Science University
- Northwest Bioproducts Research Institute, with the University of Idaho, Washington State University (WSU) Tri-Cities, INEEL and the agriculture industry

PNNL and its university partners are building an intellectual and technical infrastructure for understanding complex cellular networks. These networks underlie cellular communication and the response of cells to environmental stress or disease.

- Oregon Nanoscience and Microtechnologies Institute (ONAMI), with Oregon State University (OSU), Portland State University, the University of Oregon, the state of Oregon and high-tech industries in Oregon and southwest Washington; also the Microproducts Breakthrough Institute with OSU.

Supporting Education Programs

PNNL's support of science education and reform ranges from classroom participation and hosting science symposia for educators to a PNNL scientist serving on the Washington Assessment of Student Learning committee.

Battelle, which operates PNNL for DOE, is a founding sponsor of a program that is improving science education in more than one-third of the state's school districts. Battelle also contributed $2 million to the UW Center for Technology Entrepreneurship and is providing major support to Heritage University in Toppenish, Wash., for a science and technology complex.

With its outstanding staff and equipment, PNNL is a prime destination for postdoctoral study. In addition, more than 300 students and faculty work at PNNL every summer. Of the 470 fellowship appointments made in 2003, two-thirds were to students, faculty and visiting scientists from Northwest schools.

Polymers that change from solid to liquid were the subject of an award-winning business plan developed by UW students. PNNL sponsors technology entrepreneurship programs at two Northwest universities, in which students access PNNL's intellectual property, identify promising technologies and create plans for commercialization.

Washington State University and PNNL are teaming to develop the Bioproducts, Sciences, and Engineering Laboratory, to be located on the campus of WSU Tri-Cities. Research there will include the development of processes to convert agricultural byproducts such as corn fiber into valuable commodities.

Northwest universities also are joining with PNNL to create graduate and internship programs in such areas as biosciences and materials science.

Advancing Industry and Security

PNNL partnerships create opportunities for cost-effective research and licensing new technologies.

In the Northwest, we are teaming with the transportation industry to develop fuel cells for commercial aircraft engines and the truck of the future. In agriculture, our researchers are providing innovations from field to market.

We support the growth of the energy technology industry, including hydrogen production research, through our sponsorship of the Northwest Energy Technology Collaborative and the Northwest Transportation Conference.

Located in our Seattle office, the Pacific Northwest Center for Global Security promotes international security through education, technology outreach and other programs. Northwest-based partners include the University of Washington, the Washington State China Relations Council and the Foundation for Russian American Economic Cooperation.