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## **Homeland Security Expertise at Pacific Northwest National Laboratory (PNNL)**

<http://science-ed.pnnl.gov/>  
<http://www.pnnl.gov/nationalsecurity/technical/>

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Scientists and engineers at the PNNL are drawing upon the Lab's fundamental science base to develop the next generation of technologies for homeland security issues. Achieving greater levels of security needed to safeguard the United States from terrorism without adverse impacts on the economy or individual rights poses enormous scientific and technical challenges. PNNL is harnessing the Lab's capabilities in advanced chemical, nuclear and biological detection, analysis and visualization of massive data streams, high performance computing and simulation and modeling of complex systems to tackle the most daunting homeland security issues.

PNNL is investing its own resources to advance science for the next generation of information analysis tools for radiation, chemical and biological detection. PNNL's capabilities most relevant to protecting the homeland include atmospheric monitoring; sensors for explosives, chemical biological and nuclear threats; and information analytics.

PNNL is a world leader in atmospheric monitoring of ultra-trace and low-level radionuclides for detecting proliferation of weapons of mass destruction. The Radiological and Chemical Sciences group has had the mission of radiation detection technology development and deployment for more than 50 years. Instruments incorporating PNNL radiation detection technology have been deployed in an array of "field" locations, including: outer space, deep undersea, within the core of both naval and civilian reactors, international border crossings, international test detection network sites, high altitude aircraft, nuclear accident sites such as Three Mile Island and Chernobyl, nuclear complex sites such as PNNL is deploying radiation portal monitors at U.S. ports of entry for the Department of Homeland Security to detect smuggling of WMD onto American soil.

Electronics experts provide scientific and technology development to meet a broad range of sensor, measurement technology, electronic (including controls), and system integration application requirements to detect chemical, nuclear and biological weapons proliferation. PNNL's expertise is tailored to meet client and project needs and includes: scientific investigations and analysis; feasibility studies; measurement and data analysis; method development; validation and application; laboratory testing; prototype equipment development and evaluation; and development and deployment of field hardened equipment and methods.

PNNL mathematicians and computer scientists have been developing the science behind innovative tools that will help analysts look for trends in a vast amount of information. One of these tools is Starlight, an innovative visualization tool that recently won a R&D 100 Award from *R&D Magazine*. Starlight, which was originally developed for defense purposes, enables an analyst to look for trends in various media including structured and unstructured text, maps, digital data, video and even satellite imagery.

PNNL's William R. Wiley Environmental Molecular Sciences Laboratory (EMSL) provides world-class capabilities for enabling fundamental research on physical, chemical, and biological processes, laying a foundation for new solutions to environmental challenges and other critical issues. With instruments ranging from state-of-the-art nuclear magnetic resonance spectrometers, mass spectrometers, and one of the most powerful supercomputers in the world, to suites of surface characterization, complex systems, environmental spectroscopy and trace detection tools, EMSL has the resources needed to address a multitude of research topics.

### **PNNL's Experience Hosting Students**

PNNL holds a core belief that our nation's future is inextricably linked to future research developments in science, mathematics and technology. The demands of our changing economy and workplace, the need for an educated workforce, the impact on our national security, and the intrinsic value of mathematical and scientific knowledge make these areas essential to the education of today's students and tomorrow's citizens.

The Office of Work-Based Learning at PNNL is responsible for linking the human, financial and technical resources of the Laboratory with elementary and secondary schools, colleges and universities, and other education/scientific and technological organizations in ways that support the education, diversity, and the research objectives of DOE, PNNL and our partner academic institutions.

Over the past five years PNNL has hosted more than 5,500 interns ranging from pre-college students to post-doctoral appointees. PNNL averages approximately 250 undergraduate interns/fellows each summer.

### **Internship Information and Benefits**

- Location:** Most DHS appointments take place at the main PNNL campus in Richland, Washington, <http://www.ci.richland.wa.us/>. The cities of Richland, Kennewick, and Pasco make up the greater Tri-Cities area. PNNL is located in the Columbia basin, about 3.5 hours east of Portland and Seattle. Summers are dry and hot (90-100°F) and winters can be gray and cold (20-30°F) with some snow. The dry lands of the Columbia Basin are part of the arid shrub-steppe ecoregion, the largest natural grassland in North America. Very different from Seattle, there is very little rain and it is sunny most of the summer.
- Enrichment:** Students will have opportunities to network with PNNL researchers, attend technical seminars, poster presentations and enrichment activities/events (abstract workshop, technical paper workshop), and will also have the opportunity to attend several social events that are offered during the internship period (picnic, pick up sports, etc.).
- Housing:** PNNL provides a housing allowance of \$1250 per 10-week internship (\$125/ week) to help defray living costs in Richland.
- Dates:** PNNL is flexible with appointment start/end dates in order to work with the student's academic calendar. All summer appointments at PNNL begin on a Monday and typically end on a Friday.
- Clearances:** PNNL does not typically place students in DOE clearance-required assignments.

### **Housing and Transportation**

The Work-Based Learning office assists DHS students with all aspects of housing and transportation by providing information and resources for students to use in making their arrangements.

- Housing:** PNNL's on-site dormitory, The Guest House, (<http://www.pnl.gov/guesthouse/>) is extremely well-suited for students and is located within walking distance to most PNNL facilities. The Guest House has a very limited number of rooms available at the student rate of \$25/night during the summer. DHS students expressing interest will be housed at the Guest House on a first-come, first-served basis. PNNL also maintains a list of private homes offering room/board arrangements, primarily in Richland. These are usually less expensive than the Guest House, and some require a car or using the bus.
- Transportation:** Ben-Franklin Transit (<http://www.bft.org/>) provides regular bus service to/from PNNL on weekday mornings and afternoons, and offers Trans+Plus Night Service, a unique, demand response, curb-to-curb service within Ben Franklin Transit's boundary area. Contact Trans+Plus between 2 PM and 11:45 PM, Monday thru Saturday to schedule a ride from where you are to where you want to go. PNNL recommends that students bring their own car when possible, but it is not required. A bicycle is also useful.

### **PNNL Contact Information**

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