

## Ancient glass—a key to waste disposal

The future of radioactive waste disposal may rest, in part, in the past as scientists study ancient glass to better understand how it corrodes. Two scientists from Pacific Northwest National Laboratory who have been studying the glassification of highly radioactive waste for long-term disposal are quoted in the Feb. 20 issue of *Nature* magazine. They say comparing the corrosion of ancient glass to their computer models will improve their ability to forecast the suitability of glass mixtures to contain waste for thousands of years. PNNL is a pioneer in glassification technology, the preferred technique to immobilize and contain highly radioactive waste. PNNL researchers Peter McGrail, a materials scientist, and Denis Strachan, who studies nuclear waste materials, agree that ancient glass found buried in the Middle East will help them improve nuclear waste disposal.

## Student researchers earn recognition

Scientific research work done by students at Pacific Northwest National Laboratory received national recognition recently. Two University of Arizona students, Rachel Evans and Anh Quach, teamed with four UA professors to develop an environmentally friendly way to isolate toxic waste. They performed their research at PNNL under the Laboratory's Faculty & Student Teams (FaST) program, which allows faculty from participating universities to work with PNNL scientists to pursue research projects, while at the same time providing gifted undergraduates a chance to participate in real-life research that could yield an important product. The process they developed could eventually produce a lower-cost, more environmentally benign approach to toxic waste disposal. The students were invited to present a paper on their research at the American Association for the Advancement of Science (AAAS) convention held in Denver in mid-February. The paper was also selected by DOE for publication in its *Journal of Undergraduate Research*. For more information on PNNL student programs see <http://science-ed.pnl.gov/index.stm>.

## Leave for Mars without fuel to return



Graphic courtesy of NASA

Who would ever think of going to Mars without enough fuel on board for the return trip? Pacific Northwest National Laboratory engineers are trying to make traveling to Mars more feasible and less costly by using microchannel process technology. They are developing a lightweight, microchemical processing plant about the size of a desktop personal computer that would convert carbon dioxide from the Martian atmosphere into the propellant and oxygen needed for the return trip. Considering the cost of putting items into orbit can be as much as \$20,000 per pound, packing fuel from earth for a return trip is incredibly expensive. The ability to produce fuel while on Mars would be much more efficient, economical and practical.

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## **PNNL technologies earn environmental business award**

Two environmental technologies developed by Pacific Northwest National Laboratory researchers have been recognized for innovation and for showing “resilience and creativity in a challenging market” in the annual Business Achievement Awards competition sponsored by the *Environmental Business Journal*. The technologies — a remote sensing application for monitoring 262 million acres of rangeland and a sensor device to help engineers design more fish-friendly hydroelectric dams — earned a Technology Merit Award for the laboratory. PNNL was the only organization recognized for multiple achievements. The rangeland technology is a more accurate way for the Bureau of Land Management to economically monitor rangeland conditions and alert managers to overgrazing, weed invasion or fire damage. The sensor device, known as a sensor fish, reveals what juvenile salmon experience as they pass through the turbulent waters of hydroelectric dams on their way to the ocean.

## **Woman of Achievement chosen at PNNL**



Cindy Bruckner-Lea was honored as Pacific Northwest National Laboratory’s Woman of Achievement for 2003 at a March award ceremony. She was recognized for her outstanding professional endeavors, personal development and efforts to improve the Tri-Cities community.

A senior scientist in the Interfacial Chemistry and Engineering Department, Bruckner-Lea has a Ph.D. in bioengineering. She leads PNNL’s biodetection project in the Department of Energy’s Chemical and Biological National Security Program. She holds three patents in the area of bioanalytical chemistry and microfluidics, with additional patents pending.

Bruckner-Lea is the chair of the Sensor Division of the Electrochemical Society. She enjoys mentoring students and young scientists at the Laboratory and in the community.

The mother of three children, Bruckner-Lea volunteers for Science Bowl, as an organizer and presenter for Science Week and as a “Simple Machines” teacher at local schools. Cindy is also a Mid-Columbia Science Fair Judge, volunteers with Boys and Girls Club, is a Science Olympiad leader, and coaches fourth and seventh graders for math competitions around Eastern Washington. Cindy was selected from a group of six nominees.

## **PNNL continues support of science education reform**

The effort to enhance science education across the state of Washington continues, with school districts representing more than 400,000 students now participating in the innovative LASER project.

The LASER (Leadership and Assistance for Science Education Reform) Implementation and Dissemination Project was started by the National Science Resources Center with funding support from the National Science Foundation. LASER was launched in eight regions of the U.S. The project helps school districts develop a standards-based, inquiry-centered science education program in grades K-8.

In Washington, LASER was established in 1999. In just four years, more than one-third of the state’s school districts have become participants. The long-term goal is to involve all of Washington’s nearly 300 districts in the project.

Key leaders of the effort have included the Pacific Science Center (PSC) and Battelle, operator of Pacific Northwest National Laboratory. Battelle helped kick off the project and has provided ongoing financial support. Other sponsors include Boeing, Intel, Agilent Technologies, Amgen, Washington Mutual, the Office of the Superintendent of Public Instruction, and Smithsonian/The National Academies. For more information see <http://www.wastatelaser.org/>.

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