News Wire from Idaho National Engineering and Environmental Laboratory – Home of Science and Engineering Solutions

Welcome! This is the latest edition of the **INEEL News Wire**, which delivers news about current advances in research and technology at the multiprogram Department of Energy's Idaho National Engineering and Environmental Laboratory (INEEL), located in Idaho Falls, Idaho and operated by Bechtel BWXT Idaho for the U.S. Department of Energy. Published by the INEEL Communications Directorate, it delivers news to your desktop and is available at http://www.inel.gov/newswire/, along with an archive of all previous editions.

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October 8, 2003 – **New maps reveal expanded geothermal energy potential**

Former NASA astronaut to give glimpse of life in space
Idaho Falls, October 16, 2003 – A former NASA astronaut will share her experiences of living and working in space when she visits Idaho Falls next week to kick off the 2003 INEEL Science and Engineering Expo.

Millie Hughes-Fulford, Ph.D., orbited space on the Columbia for nine days in June 1991 as a payload specialist aboard NASA's first Spacelab mission dedicated to biomedical studies. She will describe the medical knowledge gathered on her missions in "Exploration is Humanity's Destiny," to be presented Oct. 22 at 7 p.m. at the Colonial Theatre, 498 A Street in Idaho Falls.

Hughes-Fulford will share the stage with Jerry Harbour, Ph.D., an INEEL scientist who will describe the story of unmanned aerial vehicles. Their multimedia presentations focus on "Earth's Atmosphere and Beyond," and provide the opener for Idaho Falls' three-day scientific Expo (Oct. 23-25), which will give students hands-on experience in scientific fields, mathematics, engineering and technology.

While on the Columbia, Hughes-Fulford and her crew flew more than 3.2 million miles in 146 orbits, and brought back more medical data than any previous NASA flight. Her work has helped prepare other crews for long stays in space and provided insight into medical disorders on earth such as bone disease, hypertension and heart failure. Now a professor at the University of California, Hughes-Fulford continues her space flight research by studying the effect of microgravity on isolated bone and T-cells.

Harbour's presentation will highlight the past, present and future of "flying robots." He will discuss the military, meteorological and environmental applications of unmanned aerial vehicles, and showcase some of the ongoing

efforts involving such flight operations at the Idaho National Engineering and Environmental Laboratory.

The INEEL is teaming up with the American Chemical Society to bring the 2003 Science and Engineering Expo to the Museum of Idaho and the O.E. Bell Building, in conjunction with National Chemistry Week.

More details are at: http://education.inel.gov/precollege/sci-expo.asp

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Science to come alive during 2003 INEEL Science and Engineering Expo
Idaho Falls, October 13, 2003 – Downtown Idaho Falls will soon come alive with the wonders of science and technology for thousands of area students during the third annual INEEL Science and Engineering Expo.

The Idaho National Engineering and Environmental Laboratory is teaming up with the American Chemical Society to bring the Expo to the Museum of Idaho and the O.E. Bell Building Oct. 23-25, in conjunction with National Chemistry Week.

While geared toward students in grades five to nine, the Expo will offer a variety of activities and exhibits for learners of all ages. Some 60 demonstrations and interactive exhibits will be set up to encourage students to explore science, mathematics, engineering and technology.

A 5,000-square-foot Expo Big Top tent erected next to the Museum of Idaho will be filled with chemistry activities, hands-on exhibits, and demonstrations involving fire, water, energy, soils and engineering. The O.E. Bell Building will house a variety of robotic search-and-rescue demonstrations along with space exploration and aeronautics exhibits. The Museum of Idaho will feature medical and surgical technologies, and science activities involving the world of plants, animals and bugs. Parked next to the Museum, a "Starship 2040" tractor-trailer from the NASA Marshall Space Flight Center will be open for tours. The full-sized mockup reveals what air transportation might be like in the future.

Organizers expect more than 5,000 people to visit the Expo's hands-on exhibits, interactive demonstrations, science experiments, simulations and presentations.

The Expo will kick off at 7 p.m. Oct. 22 at the Colonial Theatre with a look at "Earth's Atmosphere and Beyond." Millie Hughes-Fulford, Ph.D., a former NASA astronaut, will describe her experiences of living and working in space. Jerry Harbour, Ph.D., will tell the tale of unmanned aerial vehicles.

The Expo features indoor and outdoor demonstrations and hands-on scientific and technical exhibits. Student Days are Oct. 23 and 24 at all Expo venues. Schools are encouraged to bring students to complete a series of "Passport to Science Knowledge" activities. Family Day is Saturday, Oct. 25. All Expo activities are free and open to the public. Events are open 9 a.m. - 5 p.m. daily.

More details are at: http://education.inel.gov/precollege/sci-expo.asp
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New maps reveal expanded geothermal energy potential
Idaho Falls, October 18, 2003 – The U.S. Department of Energy today announced the availability of new, first-of-their-kind geothermal resource maps that show low- to moderate- and high-temperature geothermal energy resource locations in 13 Western states. These maps reveal a world of geothermal development opportunities that exist just beneath our feet.

The Idaho National Engineering and Environmental Laboratory (INEEL), with its 30-year history of geothermal research leadership and program management, produced the maps as part of DOE's GeoPowering the West activity, supported by professional geologists and others from each of the states. These resource maps are a starting point for educating individuals, energy professionals, economic development associations and businesses about locating, developing and using potential geothermal energy resources.

The maps have also been consolidated into a Western United States geothermal resources regional map to provide a broader view of regional potential for power and direct-use applications.

With today's technology, public and private investors can expand on the existing use of geothermal energy to help meet increasing energy demands. Further development of the extensive domestic geothermal resources will increase the nation's energy security and diversify its portfolio of energy technologies.

Geothermal working groups, established in several states including Nevada, Idaho, Oregon, Utah, Arizona, New Mexico and Washington, have used these maps to generate interest and initiate actions to develop their respective geothermal resources.

Geothermal power plants in use are among the cleanest sources of electrical power available and already are having an impact in some states. On the island of Hawaii, 25 percent of the electrical supply comes from geothermal energy. In northern Nevada, 10 percent of the region's electricity comes from geothermal sources, and its use is expected to increase. And in California, 6 percent of electrical supply comes from geothermal sources.

Geothermal energy also is used in Oregon, Utah and Idaho for power generation and space heating needs. Through these and other direct-use applications, geothermal energy provides about 600 megawatts of heat or roughly enough energy to heat and cool more than 400,000 homes. Presently, this energy is used for agriculture, industrial processing, recreational pools and spas, space heating and in-district heating, for example, where geothermal hot water is used to heat several greenhouses or aquaculture facilities.

Geothermal energy - or heat from the earth - is a clean, reliable and sustainable source of energy. This "heat beneath our feet" in the Western United States comes from underground reservoirs of steam and hot water, and provides electricity and heat for thousands of homes and businesses.

Using Geographical Information System (GIS) technology, the INEEL prepared these maps to show areas with potential for geothermal electricity production and direct use - as well as known geothermal wells and springs, existing geothermal power plants, direct-use applications and land ownership.

GIS technology, using "layers" of digitized spatial information and linking databases, provides great flexibility in manipulating and presenting this information. This improved database allows for improved data visualization and analysis.

The regional geothermal resource map and the maps for each of the 13 Western states (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington and Wyoming) are available on the Internet at http://geothermal.id.doe.gov/maps-software.

In addition to the information contained on the maps, even more detailed and valuable information is available through links from this Web page to other DOE Geothermal Program resources.

As the lead laboratory for the DOE Geothermal Energy Program's geoscience research, the INEEL is focused on characterization and management of geothermal reservoirs. INEEL also coordinates the international geothermal program for DOE as well as both managing and performing research and development activities on many of the other major activities in DOE's Geothermal Program, including the Heat Cycle, Enhanced Geothermal Systems, and Exploration programs. Working closely with the National Renewable Energy Laboratory, Sandia National Laboratories and others, the INEEL ensures availability of nationally recognized geothermal leadership to implement a successful national program.

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