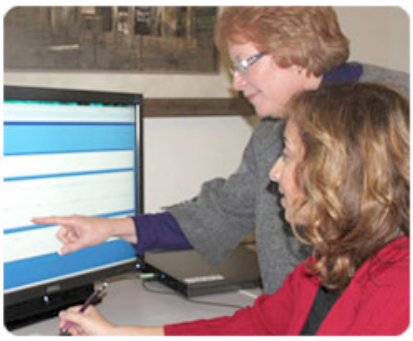
LAWRENCE LIVERMORE
REPORT

A weekly review of scientific and technological achievements from Lawrence Livermore National Laboratory, May 30-June 3, 2011

Lab is a STAR in environmental sustainability



Renee Lopez and Alda Vargas have developed two electronic systems -- eMove and eTravel -- that replace paper forms for the Global Security Principal Directorate.

The Laboratory has received one Environmental Sustainability (EStar) award and an honorable mention from the Department of Energy.

EStar awards highlight environmental sustainability projects and programs that reduce environmental impacts, enhance site operations, reduce costs and demonstrate excellence in pollution prevention and sustainable environmental stewardship.

The Laboratory earned the EStar award for the LLNL Site 300 Sulfur Hexafluoride Reduction Project, which minimized the use and release of sulfur hexafluoride (SF6), a potent greenhouse gas.

The honorable mention was for the LLNL Global Security Paperless eSystems Save Time, Money and the Environment project, which demonstrated innovative design and problem-solving while keeping environmental considerations in the forefront.

For more information, see the Web.

Sailing closer to the island of stability

Map of the voyage to the island of stability

Getting a new element onto the periodic table is a slow process. It can take up to 10 years between the discovery and its official recognition.

But it looks like elements 114 and 116, both discovered by a Laboratory team in conjunction with scientists at the Joint Institute for Nuclear Research in Dubna, Russia in 1998, are closer to being named.

In 2009, the evidence for element 112 was judged sufficient for the Institute for Heavy Ion Research (GSI) in Darmstadt, Germany to name the element copernicium **(**with the symbol Cn**).**

The official recognition of 112 has enabled the claims for elements 114 and 116 to stand up. Since both 114 and 116 decay by emitting alpha particles, they transform into isotopes of copernicium as they do so (116 minus alpha is 114, minus another alpha is 112). Detection of Cn was used to support evidence of their creation.

And the longer those nuclei live (up to 30 seconds in the case of element 114), the closer scientists get to an island of stability in a sea of highly unstable elements.

To read more, go to the Web.

Don Boyd to lead Operations and Business

Don Boyd

Don Boyd has been selected as the Laboratory's principal associate director of Operations and Business (O&B).

Efficient operations and business practices are an integral part of the Laboratory's research and development programs and underpin their success. The Operations and Business Directorate keeps LLNL's programs and facilities running efficiently.

Boyd has served as the Lab's acting O&B principal associate director since December 2009. He replaced Frank Russo, who stepped down from his position to take the job of project director for the Hanford Vitrification Plant in Washington.

Boyd joined the Laboratory as a staff member in Engineering in 1977 and held several positions including group leader for Ultrasonics and Radiography and deputy section manager for Nondestructive Evaluation in the Energy Sciences Division.

He left the Laboratory in 1983 for opportunities with Battelle Memorial Institute, including serving as deputy director for operations at Pacific Northwest National Laboratory from 2000-2006. He rejoined LLNL in 2007 as the deputy principal associate director in Global Security.

To read more, go to the Web.

New form of diamon is lighter than ever

A diamond aerogel has been hammered out of a microscopic anvil.
Image by Kwei-Yu Chu/LLNL

By combining high pressure with high temperature, Laboratory researchers have created a nanocyrstalline diamond aerogel that could improve the optics for something as big as a telescope or as small as the lenses in eyeglasses.

Aerogels are a class of materials that exhibit the lowest density, thermal conductivity, refractive index and sound velocity of any bulk solid. This material has chemists, physicists, astronomers

and materials scientists utilizing its properties in myriad applications, from a water purifier for desalinizing seawater to installation on a NASA satellite as a meteorite particle collector.

In new research, a Livermore team created a diamond aerogel from a standard carbon-based aerogel precursor using a laser-heated diamond anvil cell.

To read more, go to the Web.

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.

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