

# LAWRENCE LIVERMORE REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: Sept. 29-Oct. 6, 2008.

## LLNL rad detection registers with television, radio



### Members of the media photograph the detection technology.

During a demonstration last week, Livermore researchers showed off a Lab-developed mobile radiation detection technology that is being used by state and local governments to monitor for nuclear materials that could be part of a “dirty bomb” or nuclear device.

The radiation detection advance has been licensed to -- and converted into counterterrorism tools -- by Textron Defense Systems Corp., a firm headquartered in Wilmington, Mass.

So far, one state in the Western United States has deployed more than a score of the radiation detectors, called the adaptable radiation area monitor (ARAM), and placed them at vehicular entrances to that state to monitor for nuclear materials.

The ARAM systems can detect concealed radioactive material as small as a grain of sand moving at 45 miles per hour, nearly freeway speed.

A second state, New Jersey, has acquired from Textron Defense Systems a fleet of SUVs outfitted with the ARAM detection technology to patrol its highways, streets and public venues for nuclear materials.

The Lab hosted a news conference and demonstrated the technology earlier this week.

To see the report on KGO-TV, go to

[https://publicaffairs.llnl.gov/news/llnl\\_reports/kgotv\\_aram\\_01oct2008.mov](https://publicaffairs.llnl.gov/news/llnl_reports/kgotv_aram_01oct2008.mov)

or listen to the KGO radio report at

[https://publicaffairs.llnl.gov/news/llnl\\_reports/kgo\\_radio\\_aram\\_01oct2008.mov](https://publicaffairs.llnl.gov/news/llnl_reports/kgo_radio_aram_01oct2008.mov)

### **Profiles in science: Ken Moody**



#### **Ken Moody**

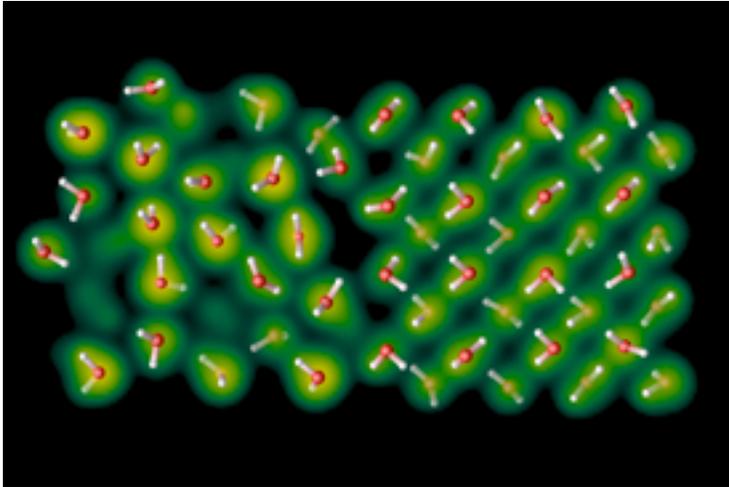
Lab radiochemist Ken Moody delved into the search for new elements while in graduate school in the late 1970s.

And now his lifelong work as well as his foray into nuclear forensics has now won him the American Chemical Society Division of Nuclear Chemistry and Technology's 2009 Glenn T. Seaborg award. He will receive his award at the spring 2009 national meeting in Salt Lake City.

For more information on Moody and his research, go to

[https://newsline.llnl.gov/\\_rev02/articles/2008/oct/10.03.08-moody.php](https://newsline.llnl.gov/_rev02/articles/2008/oct/10.03.08-moody.php)

### **Melting ice under pressure gives insight into planetary interiors**



**A snapshot from a first-principle molecular dynamics simulation of ice-VII.**

The deep interior of Neptune, Uranus and Earth may contain some solid ice.

Through first-principle molecular dynamics simulations, Lawrence Livermore National Laboratory scientists, together with University of California, Davis collaborators, used a two-phase approach to determine the melting temperature of ice VII (a high-pressure phase of ice) in pressures ranging from 100,000 to 500,000 atmospheres.

For pressures between 100,000 and 400,000 atmospheres, the team, led by Eric Schwegler, found that ice melts as a molecular solid (similar to how ice melts in a cold drink).

But in pressures above 450,000 atmospheres, there is a sharp increase in the slope of the melting curve due to molecular disassociation and proton diffusion in the solid, prior to melting, which is typically referred to as a superionic solid phase.

These findings point out that there is the possibility that water exists as a solid in the deep interior of planets such as Neptune, Uranus and Earth, which would have profound implications for the composition and transport of materials in the interiors as well as the long-term evolution of the planets as they cool.

The research appears in the Sept. 22 online edition of the *Proceedings of the National Academy of Science*.

For more information, go to

<http://www.pnas.org/content/105/39/14779.full?sid=862129ba-dbf-4e72-83a1-f732ef99b31d>

## **R&D Magazine shines the light on Lab research**



It's not easy to see a single molecule inside a living cell.

Nevertheless, researchers at Lawrence Livermore National Laboratory are helping to develop a new technique that will enable them to create detailed high-resolution images, giving scientists an unprecedented look at the atomic structure of cellular molecules.

The LLNL team is collaborating with scientists across the country and in Germany and Sweden to utilize high-energy X-ray beams, combined with complex algorithms, to overcome difficulties in current technology.

To see the article, go to

[http://www.rdmag.com/ShowPR.aspx?PUBCODE=014&ACCT=1400000100&IS\\_SUE=0809&RELTYPE=MIC&PRODCODE=00000000&PRODLETT=CY&Comm onCount=0](http://www.rdmag.com/ShowPR.aspx?PUBCODE=014&ACCT=1400000100&IS_SUE=0809&RELTYPE=MIC&PRODCODE=00000000&PRODLETT=CY&Comm onCount=0)

## **NIF wins 'green' award from Oracle**



The Lab's National Ignition Facility and Photon Science (NIF) Directorate was named a winner of an "Empower the Green Enterprise" award from Oracle Corporation.

The award, a crystal plaque, was officially presented at the Oracle Open World conference in San Francisco.

NIF utilized Oracle software in its integrated computer control automation system, as well as various database applications including procurement.

The award was accepted by Tim Frazier, a NIF software architect, who said, "We at NIF are thrilled to be able to use leading-edge technology to achieve our project milestones and pave the way for fusion in the Laboratory in the near future."

To read more about NIF and "Growing Green" in the online *Oracle Magazine*, go to <http://www.oracle.com/technology/oramag/oracle/08-jul/o48green.html>

### **Latest editon of weekly *Newsline* available**



*Newsline* provides the latest lab research and operations news. See the latest issue at [https://newsline.llnl.gov/\\_rev02/index.php](https://newsline.llnl.gov/_rev02/index.php)

### **Photo of the week**



On the Hill -- In Congress last week, Sandia President Tom Hunter, left, congratulates LLNL Director George Miller after he testified before the House Committee on Energy and Commerce. Rep. Bart Stupak asked Hunter, Miller and Los Alamos Director Michael Anastasio about security at the weapons laboratories.

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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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The Livermore Lab Report archive is available at:  
[https://publicaffairs.llnl.gov/news/lab\\_report/2008index.html](https://publicaffairs.llnl.gov/news/lab_report/2008index.html)

