LAWRENCE LIVERMORE
REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: Nov. 2-Nov. 9, 2009.

National Geographic Channel to feature Lab researchers

Two Lawrence Livermore researchers and an LLNL atmospheric modeling center are featured in a one-hour documentary that airs Thursday (Nov. 12) on the National Geographic Channel.

The program, called "Dirty Bomb Attack," shows what happens when a U.S. city -- Portland, Maine -- becomes the target of a hypothetical radiological attack. The documentary will air at 7 p.m. and 10 p.m. on Thursday.

Produced by the Maine-based Lone Wolf Documentary Group, the program starts with a dramatization of a car bomb detonating on a busy street and moves to the question of "what happens next?"

The Lab's Brooke Buddemeier and Page Stoutland as well as the Interagency Modeling and Atmospheric Assessment Center will be featured.

In addition to airing on Nov. 12, the "Dirty Bomb Attack" documentary also will be shown on Nov. 15 at 7 a.m., Nov. 19 at 3 p.m. and Nov. 22 at 11 p.m.

For more information about the documentary, go to http://channel.nationalgeographic.com/series/naked-science/4252/Overview.

Livermore rad detection takes to the seas

A small boat is shown passing between two Coast Guard vessels outfitted with LLNL-developed radiation detectors.

Laboratory researchers last week participated in training drills in the San Diego harbor to test the usefulness of a number of handheld radiological/nuclear detection devices.

The West Coast Maritime Pilot (WCMP) Project in San Diego is a Department of Homeland Security Domestic Nuclear Detection Office sponsored initiative, managed by the Laboratory in partnership with the California Emergency Management Agency.

The goal of the program is to reduce the risk of small vessels, less than 300 gross tons, being used to transport illegal radiological or nuclear (rad/nuc) materials. Small vessels pose a significant risk because they are ubiquitous and they can transit U.S. waterways relatively anonymously.

The pilot is applied in two West Coast port regions: Washington State's Puget Sound, and San Diego. San Diego was selected because of its military and commercial significance, large population density near the water and proximity to the U.S./Mexico border.

The drill involved more than 130 law enforcement and first responder personnel over a period of six days.

Laboratory researchers used portable radiation detection equipment in several different scenarios.

Gamma ray source for nuclear protection in *Physics Today*

Lab scientist Miro Shverdin adjust instruments at the output end of the T-REX machine.

Using a 40-year-old accelerator, scientists at Lawrence Livermore are developing a new gamma-ray scanning system that they say could greatly improve the ability of customs inspectors to detect nuclear weapons materials being smuggled into the US, without impeding the flow of commerce.

The Lab used to generate the T-REX, for Thomson-Radiated Extreme X-ray Source, a laser-like beam of nearly one megavolt of mono-energetic gamma rays. Through a technique called nuclear resonance fluorescence, the researchers were able to excite atoms in a piece of lithium that was shielded behind sheets of lead and aluminum, thereby revealing the lithium's presence.

The results show that the technique could locate even the lightest elements screened behind dense shielding, says principal investigator Christopher Barty. "We think that it's going to open up a whole raft of detecting, assaying and imaging applications."

To read more, go to *Physics Today*
https://publicaffairs.llnl.gov/news/lab_report/2009/nov/Physics_Today.pdf

Lab veterans honored in *Independent*

In honor of Veterans Day this coming Wednesday (Nov. 11), the *Independent* newspaper that serves Livermore and Pleasanton ran a feature of stories on on veterans from the Laboratory who served in Iraq and Afghanistan.

The stories originally were published this past summer in the Laboratory's newspaper *Newsline*.

To read the articles, go to
http://www.independentnews.com/uploads/pdf/1_05112009_1257703743.pdf

Star power comes to earth

The huge 192-beam laser system, also known as the National Ignition Facility, is now on a gradual ramp toward its full design output of 1.8 MJ of ultraviolet pulse energy.

Laser Focus World recently featured an article on the largest laser in the world. Fusion experiments begin in 2010.

Find out more about NIF and its future at the 2010 Lasers & Photonics Marketplace Seminar. In his keynote presentation, "Bringing Star Power to Earth," astronaut Jeff Wisoff will describe NIF, the ignition campaign and new opportunities in fusion energy and high-energy density science enabled by NIF. The seminar is held in conjunction with Photonics West next January in San Francisco.

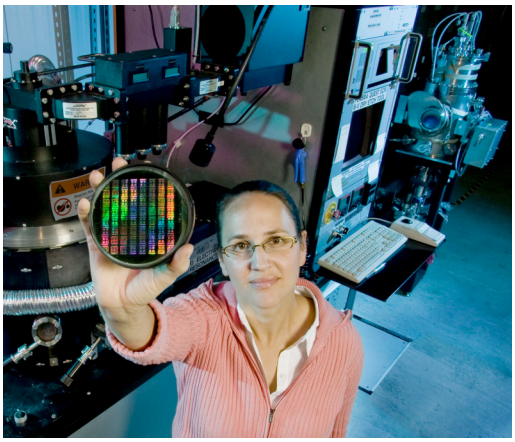
See the full story at
http://www.laserfocusworld.com/display_article/370489/12/none/none/colum/Star-power-comes-to-Earth

Latest *Newsline* available

NEWSLINE

Newsline provides the latest Lab research and operations news. See the most recent issue at https://newsline.llnl.gov

Photo of the week



Teeny weeny: Rebecca Nikolic of the Lab's Center for Micro and Nanotechnology holds an etched silicon wafer used for thermal neutron detectors. Nikolic's team etch the wafer with pillars only 20 micrometers high, making the new generation detection devices with the highest efficiencies reported.

LLNL is managed by Lawrence Livermore National Security, LLC, for the U.S. Department of Energy's National Nuclear Security Administration.

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.

To send input to the Livermore Lab Report, send e-mail mailto:labreport@llnl.gov.

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