

# LAWRENCE LIVERMORE REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: March 23-March 30, 2009.

## ***Physics World* highlights NIF**



The world's largest laser is gearing up for fusion experimentation and *Physics World* took a look at it.

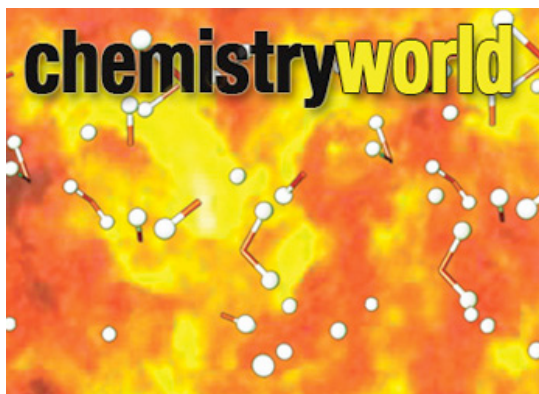
The Lab's National Ignition Facility is on its way to creating fusion in the Laboratory. When up and running, it will produce 1.8 megaJoules of laser pulses, more than 60 times more energetic than those from any machine currently in existence.

Earlier this month, NIF became the first laser facility in the world to break the megaJoule barrier, delivering 1.098 MJ of ultraviolet energy to the center of the target chamber. In addition, NIF successfully fired all 192 of its laser beams to the center of the 10-meter diameter target chamber.

In only a few nanoseconds, the 1.1 MJ pulse precisely matched the shape necessary for achieving ignition. The main laser delivered 1.952 MJ of infrared energy.

To read the *Physics World* article, go to the Web:  
[https://newslines.llnl.gov/\\_rev02/articles/2009/mar/physics\\_world\\_nif.jpg](https://newslines.llnl.gov/_rev02/articles/2009/mar/physics_world_nif.jpg)

## **Water with a bang**



**Simulations of the detonation of a high explosive show that 'extreme' water can act as a chemical catalyst.**

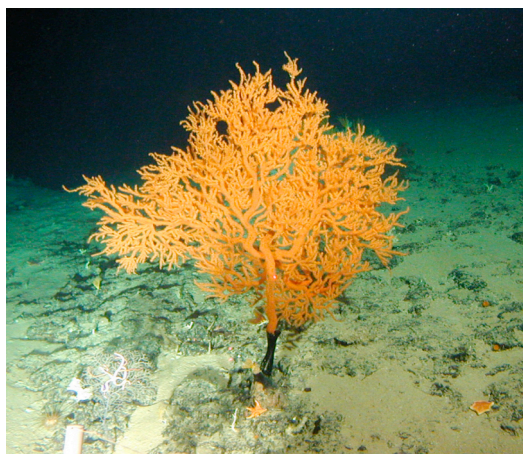
Laboratory researchers have found that water plays a key role as a chemical catalyst in complex explosions.

The findings could give insight into designing safer, less sensitive explosives while providing clues to how giant planets and stars are formed.

The researcher was published in the new journal, *Nature Chemistry*.

To read more, go to *Chemistry World* at <http://www.rsc.org/chemistryworld/News/2009/March/25030903.asp>

**Oldest living marine organism goes deep**



***Leiopathes* (deep water black) coral, Photo: NOAA Hawaiian Undersea Research Lab**

Deep-sea corals from about 400 meters off the coast of the Hawaiian Islands are much older than once believed and some may be the oldest living marine organisms known to man.

Researchers from Lawrence Livermore, Stanford University and the University of California at Santa Cruz have determined that two groups of Hawaiian deep-sea corals are far older than previously recorded.

Using the Lab's Center for Accelerator Mass Spectrometry, LLNL researchers Tom Guilderson and Stewart Fallon used radiocarbon dating to determine the ages of *Gerardia sp.*, or gold coral, and specimens of the deep-water black coral, *Leiopathes sp.* The longest lived in both species was 2,740 years and 4,270 years, respectively. At more than 4,000 years old, the deep-water black coral is the oldest living skeletal-accreting marine organism known.

"And to the best of our knowledge, the oldest colonial organism yet found," Guilderson said. "Based on the carbon 14, the living polyps are only a few years old, or at least their carbon is, but they have been continuously replaced for centuries to millennia while accreting their underlying skeleton."

To read more, go to <http://www.pnas.org/content/early/2009/03/20/0810875106.full.pdf+html>

### **Laboratory health physicist elected to NCRP**



#### **Brooke Buddemeier**

Laboratory health physicist Brooke Buddemeier has been elected to the National Council on Radiation Protection and Measurements (NCRP).

Buddemeier becomes one of 100 NCRP council members. They are elected to six-year terms.

"It's a great honor and I look forward to working with my fellow scientists to continue the NCRP's important national mission that forms the basis of radiation protection policy and practices in industry, medicine and public venues," Buddemeier said.

Buddemeier assisted in the "stand-up" of the U.S. Department of Homeland Security (DHS), working there for three-and-a-half years between 2003 and 2007. He supported the DHS Science and Technology Directorate's emergency preparedness and response R&D program and served as one of the department's subject matter experts for radiological and nuclear emergency responses.

### **Latest *Newsline* available**



*Newsline* provides the latest Lab research and operations news. See the most recent issue at <https://newsline.llnl.gov/rev02/index.php>

### **Photo of the week**



**Science breakthrough:** This week, 249 budding scientists had a chance to discuss their projects with seasoned scientists and judges, and compete for cash and other prizes at the Lab's 13th annual Tri-Valley Science and Engineering Fair (TVSEF) at the Robert Livermore Community Center. Here, Phillip Zhou, from Pine Valley Middle School in San Ramon, demonstrates his "A Sound for a Light" project.

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.

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