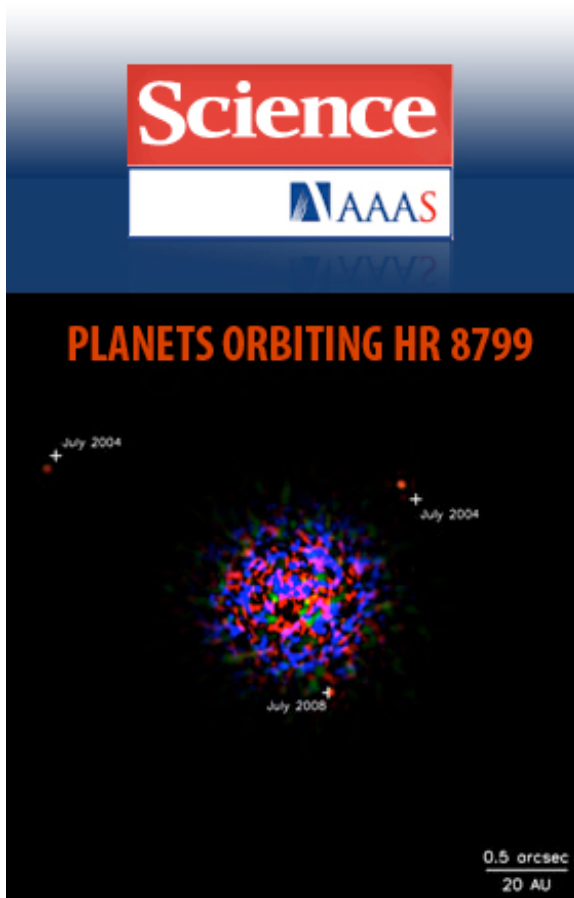


# LAWRENCE LIVERMORE REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: Dec. 22, 2008-Jan. 12, 2009.

Planet research reaches top 10 for *Science*, APS



Using the Keck and Gemini land-based telescopes, Bruce Macintosh's research, which led to the discovery of three new planets circling a star much like our own, reached No. 2 on *Science Magazine's* Top 20 2008 Breakthroughs. In addition, editors and science writers at the American Institute of Physics and the American Physical Society have named the same research as one of the top 10 physics story of the year.

Macintosh and colleagues from the NRC Herzberg Institute of Astrophysics in Canada, Lowell Observatory and University of California Los Angeles for the first time took

snapshots of the multi-planet solar system that orbits a dusty young star named HR8799, which is 140 light years away and about 1.5 times the size of our sun.

*Science* named Macintosh's research the first runner-up on the list of Top 10 breakthroughs of 2008. *Science*, published by AAAS, the nonprofit science society, annually recognizes 10 of the year's most significant scientific accomplishments. The Top 10 list appears in a special feature in the journal's Dec. 19 issue.

To read more, go to the *Science* Website at <http://www.sciencemag.org/cgi/content/full/322/5909/1768>

and the APS site at [http://blogs.physicstoday.org/update/2008/12/images\\_of\\_exoplanets\\_orbiting.html](http://blogs.physicstoday.org/update/2008/12/images_of_exoplanets_orbiting.html)

### **World's largest laser featured in London's *Telegraph***



### **The tiny target for the lasers produced at the National Ignition Facility.**

In a structure the size of three football fields, LLNL scientists at the National Ignition Facility are preparing to fire the most powerful laser in history at a tiny target to understand what conditions are like at the heart of the planet.

London's *Telegraph* newspaper recently featured an article on NIF, the world's largest laser.

To read the story, go to <http://www.telegraph.co.uk/scienceandtechnology/4126873/How-the-National-Ignition-Facility-lets-us-journey-to-the-centre-of-the-Earth.html>

## Computational tools help track space debris



A visualization generated by Ming Jiang, of LLNL's Computation, shows the simulated debris from an exploded satellite in the lower Earth orbit, along with active satellites positioned using a semi-analytical orbital propagator.

The work is part of the Laboratory's Space Situational Awareness (SSA) Project to identify the location of every object orbiting Earth and determine whether it poses a threat to national space assets.

Both Ming and David Jefferson, also of Computation, are working with astrophysicists to design and implement a comprehensive set of analysis, modeling, simulation and visualization tools for this effort. These computational tools will provide LLNL with the necessary capability for analyzing the performance of imaging and detection systems that are used in current SSA systems and enable the evaluation of the relative efficacy of various SSA methods.

## Historic meeting with the British



Last year marked the 50th anniversary of the 1958 Mutual Defense Agreement on Atomic Weapons between the United States and the United Kingdom. Culminating this event was the reaffirmation of the relationship by the signing of a new Statutory Determination under the Mutual Defense Agreement by Secretary of Defense Robert Gates and Secretary of Energy Samuel Bodman.

This Statutory Determination strengthens the US-UK partnership in sustaining nuclear deterrence by enhancing the abilities of the two countries to collaborate in science and technology.

Last week, the first visit by the United Kingdom under the new Statutory Determination was hosted by the Laboratory. The British delegation included: Nick Bennet, director, General Strategic Technologies; Brian Bowsher, director, Systems Engineering; and Richard Clegg, chief scientist, both of the Atomic Weapons Establishment. Gen. Jonathan George represented the NNSA. Also participating was Alice Williams, Livermore's new site office manager.

### **Lab celebrates the Year of Science with 'Science Chat'**



This year, the world celebrates the 200th anniversary of Darwin's birth, the 150th anniversary of his publication "On the Origin of Species," the 400th anniversary of Galileo's first use of a telescope to study the skies, and the 400th anniversary of the publication of Kepler's first two laws of planetary motion.

To mark these significant events, the American Institute of Biological Sciences, the National Academy of Sciences and more than 150 other organizations have declared *Year of Science 2009*, a national year of engaging the public and

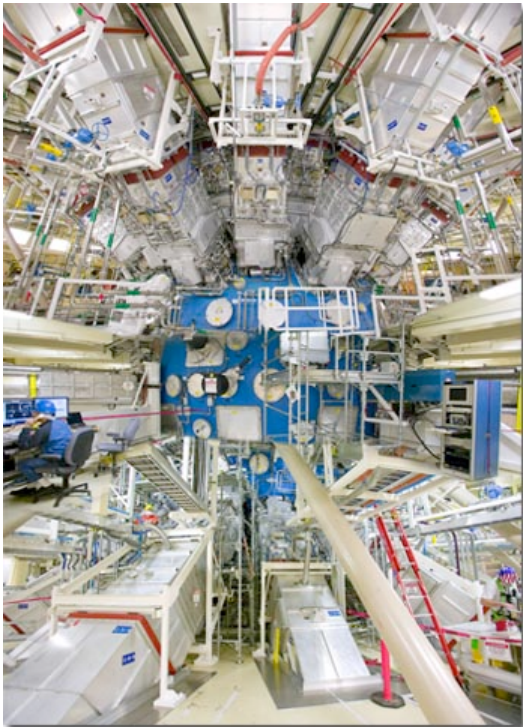
enhancing the understanding of science, why it matters and who the scientists are.

In recognition of the Year of Science, the Laboratory will present "Science Chat" - a series of public discussions with leading Lab scientists.

The first talk, "Carbon Dating, Anthrax and Forensic Science," by John Knezovich, will take place at 7-8:30 p.m., Tuesday, Jan. 13, at the Livermore Public Library, Civic Center branch, 1188 S. Livermore Ave., community rooms A and B. This discussion will highlight the principles of carbon dating and will include examples of how this approach is being used to provide insights useful for forensic investigations. Science Chats are open to the public

For more information, see the flier at [https://newsline.llnl.gov/\\_rev02/articles/2009/jan/images/scienceChat.pdf](https://newsline.llnl.gov/_rev02/articles/2009/jan/images/scienceChat.pdf)

### **Photo of the week**



Hanging out: This photo montage of the target chamber of the National Ignition Facility combines three floors, spanning more than 40 feet inside. NIF will be completed on March 31, 2009.

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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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