

LAWRENCE LIVERMORE

REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: Feb. 17-Feb. 23, 2009.

NIF featured on BBC



The target alignment sensor system is mounted on a retractable arm inside the 30-meter diameter NIF target chamber.

Nuclear fusion is nature's power source. From the sun to the most distant stars, the energy that lights up the universe is released by sticking hydrogen nuclei together to make helium.

Since hydrogen is the most abundant element in the universe, it seems sensible to ask whether we might endeavor to do the same and power ourselves out of our serious energy crisis by building stars on Earth. That's where Livermore's National Ignition Facility comes in.

NIF will blast tiny pellets of deuterium-tritium fuel with a single 500-trillion-watt laser beam. This is a big number; about 1,000 times the power consumption of the United States. This gargantuan short-lived laser pulse causes the fuel pellet to collapse and detonate, producing a mini-star -- or fission -- for a fraction of a second.

To read more, go to to <http://news.bbc.co.uk/2/hi/science/nature/7891787.stm>

Block an asteroid before it hits Earth



Barringer Meteorite Crater, near Winslow, Ariz., is one of the best known impact craters on planet Earth

If a meteorite hits a populated area on Earth, the effects would be devastating.

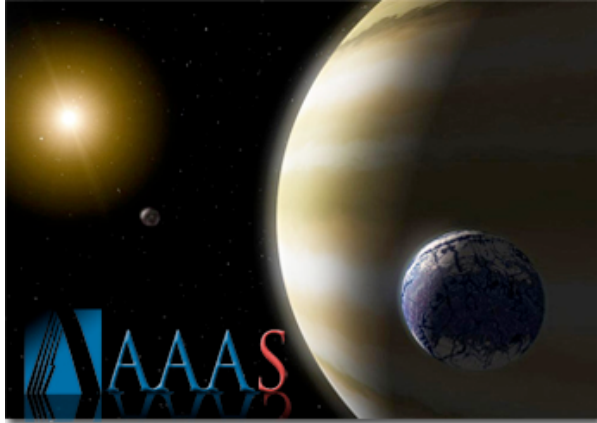
It's that rare but plausible scenario of a large meteorite striking an increasingly crowded Earth that has LLNL's David Dearborn devising strategies to monitor and then thwart these celestial bodies. An article in the *San Jose Mercury News* recently described his work.

Dearborn proposes sending spacecraft bearing nuclear explosives to an asteroid identified as a threat by a NASA program called "Space Guard." The program is tasked with tracking near-Earth asteroids larger than 1 kilometer. Congress asked NASA to create the program in 2005.

Dearborn, a research physicist, recently spoke at three free seminars in Livermore, describing his strategy for using nuclear blasts to prevent devastating meteorite strikes on Earth.

To read the *San Jose Mercury News* story, go to http://www.mercurynews.com/breakingnews/ci_11717387

LLNL planet research highlighted at annual AAAS meeting



An artist's view of a an extrasolar planet. Photo courtesy of NASA.

The Lab's National Ignition Facility (NIF) took center stage last week at the American Association for the Advancement of Science (AAAS) annual conference in Chicago.

LLNL's Gilbert "Rip" Collins and Raymond Jeanloz of University of California, Berkeley, organized a three-hour symposium entitled "Origin and Evolution of Planets," featuring leading astrophysicists and materials scientists.

The six speakers described their individual research efforts, which stretch from finding Earth-like planets outside our solar system, determining how they were formed, estimating their sizes and physical makeup and attempting to predict the effects of gravity on the elements at the cores of such planets.

Many of the answers, said the panelists, will be provided by NIF.

In the past decade or so, at least 300 planets have been found orbiting nearby stars. Current detection techniques limit most discoveries to giant gas and ice planets at least as large as Jupiter.

To read more, go to <https://newsline.llnl.gov/rev02/articles/2009/feb/02.20.09-aaas.php>

Lab scientist selected for fusion energy committee



Bruce Cohen

LLNL scientist Bruce Cohen of the Physical and Life Sciences Directorate was recently selected to become a new member of the Fusion Energy Scientific Advisory Committee (FESAC).

The FESAC provides independent advice to the Department of Energy's Office of Science on complex scientific and technological issues that arise in the planning, implementation and management of the fusion energy sciences program.

Committee members are drawn from universities, national laboratories and private firms involved in fusion research. FESAC members serve a two-year term as special government employees during their work on FESAC. Additional ex-officio committee members include the chairs of the APS Division of Plasma Physics and ANS Fusion Energy Division and a representative from the Institute of Electrical and Electronics Engineers (IEEE) executive committee.

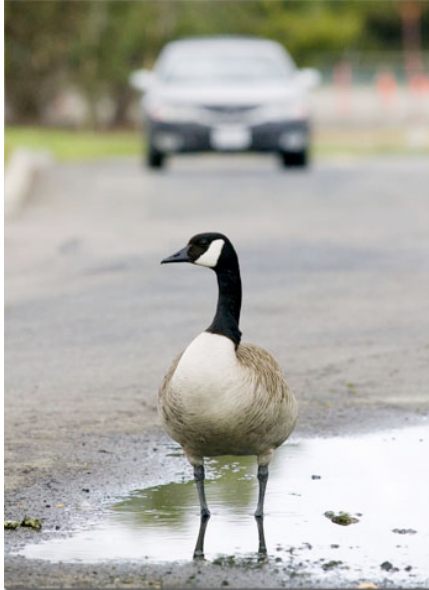
To learn more about FESAC, go to <http://www.ofes.fusion.doe.gov/fesac.shtml>.

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



Fowl weather: The Canada geese are back and nesting at the Livermore Site. Every year, the Canada geese return to the site of their birth for mating.

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>.

The Livermore Lab Report archive is available at:
https://publicaffairs.llnl.gov/news/lab_report/2009index.html

