

LAWRENCE LIVERMORE REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: Sept. 7-14, 2009.

ABC takes on blast wave research



ABC reporter Richard Hart visited the Laboratory recently to explore new research that shows how battlefield blasts alone, without direct impact, may cause brain damage.

While it's clear that direct impact to the head can lead to brain damage, the new study shows that blast waves alone can cause traumatic brain injuries to soldiers.

To better understand that process, LLNL's William Moss and Michael King and the University of Rochester's Eric Blackman compared numerical simulations of a head colliding with a wall to one being struck by an explosion's blast waves. Their findings could lead to improved military helmet design.

To watch the news piece, go to

https://publicaffairs.llnl.gov/news/lab_report/movies/KGOTV_BrainInjuryHelmet_0909.mov

'Giant proton machine' in *San Francisco Business Times*



George Caporaso of LLNL explains the machine that fires proton beams at cancer.

In a recent article, the *San Francisco Business Times* highlighted the Lab's proton therapy concept.

An accelerator built at the Lawrence Livermore National Lab in 1982 to take lightning-fast pictures of nuclear explosions may now hold the key to delivering improved cancer treatment to the masses.

Like radiation therapy, protons blasted at tumors prohibit cancer cells from replicating. And the process has additional advantages: There are fewer side effects and less damage to surrounding organs.

TomoTherapy, of Madison, Wisc., has licensed the technology to treat cancer.

For more information, go to

<http://sanfrancisco.bizjournals.com/sanfrancisco/stories/2009/09/07/focus2.html>

Award winning fusion science



From left: Riccardo Betti and Edward Moses are winners of the 2009 Edward Teller Medal

Edward Moses, the director of the National Ignition Facility at Lawrence Livermore, and Riccardo Betti, professor and director of the Fusion Science Center of Extreme States of Matter and Fast Ignition at the University of Rochester, are recipients of the 2009 Edward Teller Medal.

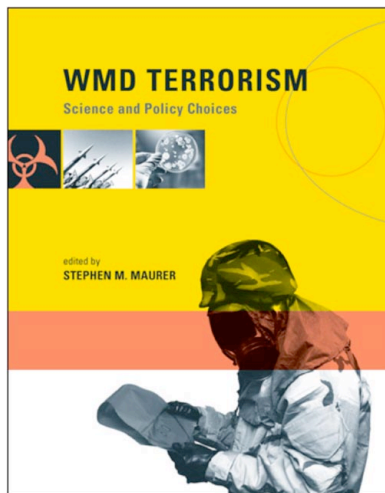
The American Nuclear Society (ANS) presented the awards last week at the international conference on Inertial Fusion Science Applications (IFSA) in San Francisco.

Moses was cited for his "leadership in the development and completion of the National Ignition Facility" (NIF). As principal associate director for NIF and Photon Science at Lawrence Livermore (LLNL), Moses is leading an international effort to perform the first ignition experiments on NIF.

Betti was cited for his "seminal contributions to the theory of hydrodynamic instabilities, implosion dynamics and thermonuclear ignition in inertial confinement fusion." A professor at the University of Rochester and director of the Fusion Science Center for Extreme States of Matter, Betti has devised new ignition concepts and theoretical models for inertial fusion implosions and scaling laws for ignition.

For more, go to <https://newsline.llnl.gov/rev02/articles/2009/sep/09.11.09-medals.php>

LLNL scientists pen chapters on terrorism



A new book, "*WMD Terrorism: Science and Policy Choices*," just released by MIT Press is a collection of essays on the threat of WMD terrorism, from the motivations of terrorists to acquire and use such weapons and the technical hurdles involved, to strategies of prevention, risk assessment and emergency response.

Five of the book's 18 chapters were written by LLNL scientists. Their subjects are representative of the multifaceted nature of WMD terrorism and the Laboratory's multidisciplinary approach to the problem.

The book is being used this fall in undergraduate and graduate public policy courses at UC Berkeley, and several Lab scientists are scheduled as guest lecturers.

For more information, go to https://newsline.llnl.gov/_rev02/articles/2009/sep/09.11.09-book.php

Photo of the Week



Robotic assembly machine keeps NIF on target: LLNL scientists and engineers have developed the precision robotic assembly machine to manufacture the small and complex laser-driven fusion ignition targets for the world's largest and most energetic laser, the National Ignition Facility.

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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https://publicaffairs.llnl.gov/news/lab_report/2009index.html