

LAWRENCE LIVERMORE REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: June 1-8, 2009.

***New York Times* touts NIF as a valuable national asset**



Inside the NIF target chamber.

In a recent editorial, the *New York Times* supported the recently dedicated National Ignition Facility.

The article describes NIF as an important step toward maintaining the nation's nuclear deterrent, developing fusion energy and conducting basic research.

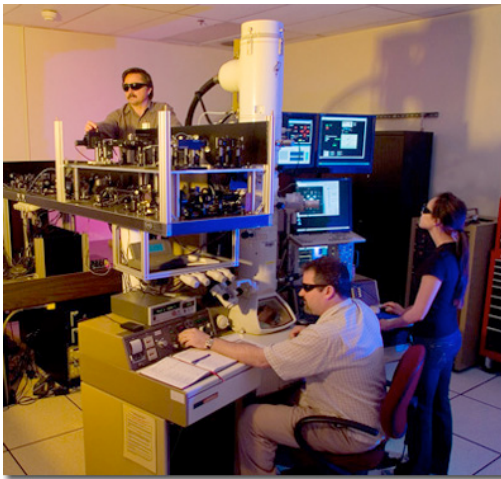
The principal goal over the next year or two is to reach self-sustaining "ignition," the point at which more energy is produced from fused atoms than is applied to make it happen.

The article concludes with: "...the energy potential is alluring enough that all of us should root for NIF to succeed."

To read more, go to

http://www.nytimes.com/2009/05/29/opinion/29fri3.html?_r=1

Lab scientist receives \$2 million NIH grant for electron microscope



The dynamic transmission electron microscope at Lawrence Livermore National Laboratory.

LLNL scientist Nigel Browning and his UC Davis colleagues were recipients a \$2 million grant from the National Institutes of Health to develop the world's first electron microscope capable of filming live biological processes.

The team's plan is to extend the capabilities of a dynamic transmission electron microscope or DTEM, located at Livermore, to allow for 10 to 100 images per millionth of a second, while capturing details as small as 10 nanometers, or about four times the diameter of a DNA molecule.

Currently, there are only three DTEMs in use worldwide, none of which are designed for observing living systems. Browning and his team will be building a "Bio-DTEM" where three new elements must be incorporated into the design: a custom-built system to hold an ultra-thin layer of fluid containing the biological sample to be imaged; a short-exposure-time imaging mode, to avoid the blurring problem created when molecules move through their fluid medium; and a new generation of scientific instrumentation to deliver optimum image contrast for biological samples and to correct image distortions generated by lenses.

To read more, go to

http://www.news.ucdavis.edu/search/news_detail.lasso?id=9125

Fox News gazes at the National Ignition Facility



The NIF target chamber.

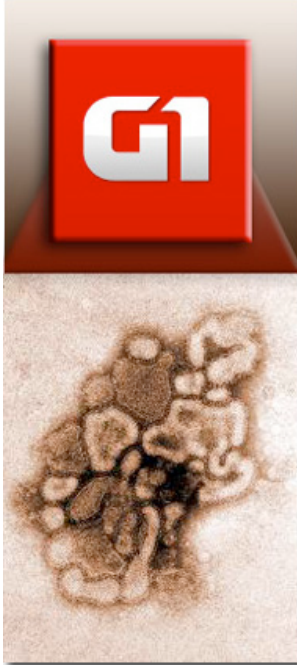
On the verge of an energy breakthrough, the dedication of the National Ignition Facility could be the biggest step forward in the pursuit of clean energy.

NIF is expected to create nuclear fusion in the laboratory, the same kind of energy that powers the sun. The process involves triggering a miniature nuclear explosion inside the target chamber with the help of 192 lasers.

Fox News reports that for a single moment, it could light up the entire country. NIF could be a game changer for meeting the world's energy needs.

To view the story, go to https://publicaffairs.llnl.gov/news/lab_report/movies/FOXNewsNIF_dedication_29may2009.mov.

Swine flu may not be so severe



Laboratory researchers have provided a molecular profile of the influenza virus more capable of killing humans over the past century -- and the good news is that the new form of H1N1 apparently does not fit this profile.

From a total of 34 genes that define a flu virus that moves very fast and kills, H1N1 only has 17.

Laboratory computer scientists Jonathan Allen and Tom Slezak found that even some viruses with this package of 34 features can be relatively easy to address. Therefore, the lack of most of these features probably indicates that in its current form, the new flu is not as dangerous as was previously believed.

To read more, go to

<http://translate.google.com/translate?hl=en&sl=pt&u=http://g1.globo.com/Noticias/Ciencia/0,,MUL1113732-5603,00-NOVA%2BGRIFE%2BAINDA%2BNAO%2BTEM%2BPERFIL%2BDE%2BPANDEMIAS%2BASSASSINAS%2BSUGERE%2BESTUDO.html&ei=DyMfSs7DKKSCtgP4IKmNCQ&sa=X&oi=translate&resnum=1&ct=result&prev=/search%3Fq%3D%2522Reinaldo%2BJos%25C3%25A9%2BLopes%2522%2Bslezak%26hl%3Den%26client%3Dfirefox-a%26rls%3Dorg.mozilla:en-US:official%26hs%3Dwhp%26sa%3DG>

Discovering how nuclear waste produces clean energy



Last week's official dedication of the National Ignition Facility, has set some physicists to plotting ways in which nuclear fusion could be put to work in a new generation of nuclear power plants.

Fusion is the process of forcing the nuclei of atoms so close together that they fuse into a nucleus of a new element. (Fission is the opposite: energy produced by splitting nuclei.) The new, fused nucleus weighs less than the original two.

In a fusion-fission hybrid reactor proposal suggested by NIF researchers, a fusion chamber would be surrounded by a blanket of fissionable material, like nuclear waste, that would serve as an additional fuel source. It would work by using the neutrons from fusion to help turn nuclear waste into nuclear fuel and then burn it until almost none is left.

To read more, go to

<http://blogs.discovermagazine.com/80beats/2009/06/03/could-a-new-generation-of-power-plants-turn-nuclear-waste-into-clean-fuel/>

Latest *Newsline* available



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

Photo of the week



How old? (Center) Graham Bench, director of the Lab's Center for Accelerator Mass Spectrometry, explains to visitors how accelerator mass spectrometry can be used to date ancient items by comparing amounts of carbon 14 to carbon 12. CAMS is used for radiocarbon dating, exposure dating in geology, biomedical research and national security missions.

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

