

# LAWRENCE LIVERMORE REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: Sept. 29-Oct. 5, 2009.

## George Miller participates in energy summit



### George Miller at the National Energy Summit & International Dialogue

Laboratory Director George Miller recently participated in a panel discussion as part of the National Energy Summit & International Dialogue.

Miller, along with industry and government energy officials, spoke during the "Spawning Technological Breakthroughs and Entrepreneurships" panel.

Daniel Lyons, technology editor of *Newsweek*, moderated the fifth of six leadership dialogues on day one of the National Energy Summit and International Dialogue in Washington, D.C. Thomas Baruch, Ralph Cicerone, John Holdren and Miller participated.

The two-day summit, part of the Council on Competitiveness' Energy Security, Innovation & Sustainability Initiative, consisted of discussions between an elite group of top corporate CEOs, senior U.S. and global government officials, university presidents, labor union leaders and other dignitaries.

The participants outlined specific strategies for meeting U.S. energy and sustainability challenges and summarized private sector principles on climate change just months before the UN Climate Change Conference in Copenhagen.

To watch the panel discussion, go to <http://www.cleanskies.com/videos/spawning-technological-breakthroughs-and-entrepreneurships>

## China might boost U.S. effort to capture carbon gases



### A coal-powered plant.

As the United States begins spending stimulus money to seek a commercially viable way to capture carbon dioxide from coal burning power plants and bury it underground, doing some of the work as a joint project in China possibly would cut costs and time.

In a recent story that appeared in the *Kansas City Star*, the Laboratory's Julio Friedmann, who leads research in carbon capture and storage and who has met with Chinese officials to discuss the prospects for low-carbon coal, said that Chinese officials are enthusiastic about carbon capture and storage. He said the Chinese see the potential value of the technology for export.

At the same time, Friedmann said, they don't think the cost is reasonable. Carbon capture and storage as it's currently configured would require a large reduction in electricity output by coal power plants or the use of extra coal.

Friedmann said the costs of wind and solar had come down as a result of research and development, but the costs of carbon capture and storage would, too, by 50 percent to 80 percent.

"All the science we have leads us to conclude we can construct and operate it safely and effectively," he said. Scientists have worked out the technology on a smaller scale, but the next step is large demonstration projects.

To read more, go to <http://www.kansascity.com/444/story/1466969.html>

## Supercomputers becoming cheaper by the dozen



### BlueGene/L supercomputer

High-performance computing (HPC) has become far more affordable in recent years and has expanded into more enterprises, from drug development to automakers simulating car crashes and food companies looking for the best way to package a snack.

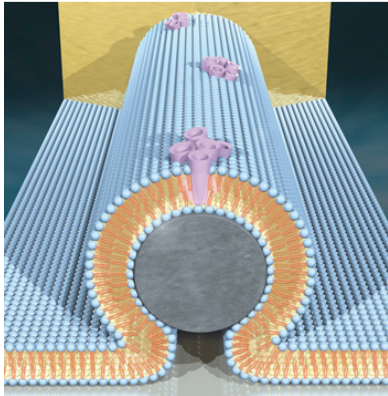
And companies are noticing it, according to a *Reuters* article. Michael Dell, CEO of Dell Inc. recently visited the Laboratory to meet with Lab officials to talk shop as they marked the installation of a new Dell supercomputer named "Coastal".

Dell -- along with partners including Intel and Cisco Systems -- is also working with the Lab to develop an advanced supercomputing test bed system.

Lawrence Livermore, which conducts national security research for the U.S. government, is home to some of the world's fastest computers, including IBM's BlueGene/L, which held the top spot for several years.

To read more, go to <http://www.reuters.com/article/ousivMolt/idUSN2445199820090924>

## Nanowires may help with prosthetic devices



**The nanowire and lipid configuration is a representational image of a vertical nanowire**

Prosthetic devices may soon more accurately mimic the motions of actual limbs thanks to a new nanowire technology developed by Laboratory scientists.

Current prosthetic devices do not provide feedback to the wearer or adjust to variable loads or complex terrains. To address this problem, LLNL scientists have developed a technique that enables nanowires to function like nerve cells, opening the door to improved communication between prosthetic devices and the body.

Aleksandr Noy, a chemist in LLNL's biosciences and biotechnology division, and graduate students Nipun Misra and Julio Martinez, have developed a means for encasing nanowires in a fatty membrane -- a step toward improving bioelectronic devices.

While bare nanowire transistors exhibit a measurable change in electrical properties when they are exposed to acidic or basic solutions, the membrane-sealed nanowires do not react to their environment because the fatty layer protects them, just like a biological cell membrane.

To read more about the technology, go to *MedicalDevice.com* at <http://www.devicelink.com/mpmn/archive/09/10/005.html>

**Visalia Times highlights green clean up of SCE Superfund site**



**The former site of Southern California Edison's pole yard has been taken off the national list of Superfund sites. Photo credit: Ron Holman**

The Southern California Edison Visalia pole yard has a lot to brag about.

After being used for 60 years to chemically coat wooden utility poles, the yard made environmental history late last month when it was removed from the list of contaminated "Superfund" sites awaiting cleanup.

It's the first time a wood-treatment site has been removed from the list, which was established in 1980 and features more than 1,250 U.S. sites. At the site, Edison treated utility poles with chemicals that ended up contaminating groundwater in that area and beyond.

The 20-acre property was placed on the Superfund list in 1989. Lawrence Livermore played a critical role in getting the site cleaned up hundreds of years ahead of schedule through a steam cleaning technology and a process called hydrous pyrolysis/oxidation (HPO), that converts contaminants in the ground to benign products such as carbon dioxide, chloride ions and water.

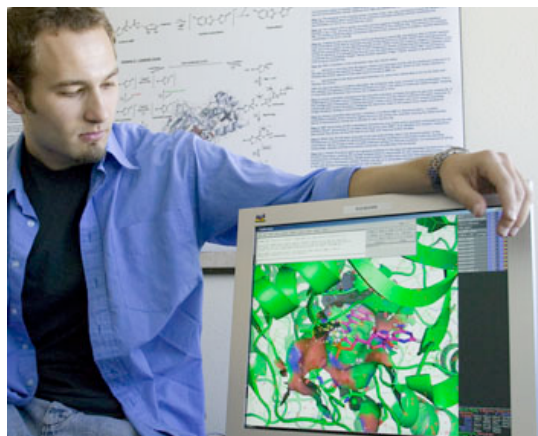
The *Visalia Times Delta* recently featured an article on the de-listing. To read more, go to <http://www.visaliatimesdelta.com/apps/pbcs.dll/article?AID=2009909250313>

**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



**Sealed with a kiss:** Gert Kiss of the Science and Technology Principal Directorate uses complex computer simulations to understand bioluminescence.

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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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