

LIVERMORE LAB REPORT

A weekly review of scientific and technological achievements from Lawrence Livermore National Laboratory, Jan. 28-Feb. 1, 2013.

HPC wire LOOK OUT, HERE SHE COMES



Dona Crawford

There are people to watch for and then there are people to really keep an eye on.

And Lawrence Livermore's Dona Crawford, associate director for Computation, is the latter according to *HPCwire*, which named her as one of its "People to Watch" in 2013.

The annual list "pays tribute to an exemplary group of the best and brightest minds of HPC, whose hard work, dedication and contributions we believe reach beyond the spectrum of high performance computing and will influence the direction that technology will lead us in 2013 and beyond."

Crawford has the distinction of being the first woman to be twice selected for the list, previously appearing in 2002. Each year, 12 influential individuals in HPC are selected for the list. As part of the profile appearing in *HPCwire*, Crawford named the top five HPC initiatives or technologies to watch in 2013.

To read more, go to [HPCwire](#).

CONTRA COSTA TIMES SHEDDING THE DANGER



The highly breathable membranes have pores made of a few nanometer-wide, vertically aligned carbon nanotubes that are surface modified with a chemical warfare agent-responsive functional layer.

Envision, if you will, a soldier living through a chemical attack, shedding the top layer of his protective uniform like a snakeskin, and goes on to fight another day.

For the past three years, scientists at Lawrence Livermore National Laboratory have been working with a material that could do just that.

Francesco Fornasiero and his team originally developed the technology to desalinate water, but realized it could fit the bill for a project by the Defense Threat Reduction Agency.

The fabric would incorporate carbon nanotubes that could quickly transform from a breathable state -- with pores too small for bulkier biological germs to pass through -- to a temporary shield that also blocks the tinier molecules of dangerous chemicals.

To read more, go to the [Contra Costa Times](#).



SHH, I CAN'T HEAR THAT PLANE



The Sequoia supercomputer.

Quieter airplanes could be a thing of the future thanks to a feat of supercomputing prowess.

Stanford researchers have set a new record in computational science using Lawrence Livermore's supercomputer Sequoia, a supercomputer with more than one million computing cores, to solve a complex fluid dynamics problem -- the prediction of noise generated by a supersonic jet engine.

Sequoia once topped the list of the world's most powerful supercomputers, boasting 1,572,864 compute cores (processors) and 1.6 petabytes of memory connected by a high-speed five-dimensional torus interconnect.

Because of Sequoia's impressive numbers of cores, the team was able to show for the first time that million-core fluid dynamics simulations are possible -- and also contribute to research aimed at designing quieter aircraft engines.

To read more, go to [R&D Magazine](#).

pressdemocrat REACHING FOR THE STARS



Jose Hernandez talks with kids during a recent visit to the Petaluma Museum. Photo courtesy of *The Press Democrat*.

Jose Hernandez grew up in a typical migrant farm-working family in the Central Valley, but he reached for the stars when he saw grainy black-and-white television images of a moon walk that changed his life.

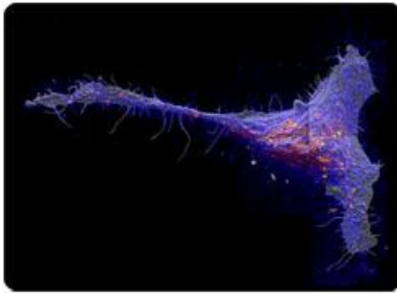
When he was 9, he and his family watched a live broadcast of Apollo 17. "I remember being mesmerized," he said recently as he recalled watching the lunar walk on TV, then walking outside to look at the moon.

"I remember telling myself, 'That's what I want to be, I want to be an astronaut,'" said Hernandez, who worked at Lawrence Livermore National Laboratory and helped develop a successful device for breast cancer screening.

Hernandez, 50, made his dream a reality by flying on the Space Shuttle Discovery on a two-week mission to the International Space Station in 2009.

To read more, go to [The Press Democrat](#).

ScienceNewsline A NEW LOOK AT CELL MEMBRANES



The local abundance of metabolically incorporated 15N-sphingolipids in the plasma membrane of a fibroblast cell.

A new way of looking at a cell's surface reveals the distribution of small molecules in the cell membrane, changing the understanding of its organization.

A novel imaging study by researchers from Lawrence Livermore National Laboratory, the University of Illinois and the National Institutes of Health revealed some unexpected relationships among molecules within cell membranes.

Their findings provide a new way of studying cell structure and ultimately its function.

To read more, go to [Science Newsline](#).

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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](#).