



## Evidence suggests new state of matter

By Anne M. Stark  
NEWSLINE STAFF WRITER

Laboratory scientists have discovered a new melt curve of hydrogen, resulting in the possible existence of a novel superfluid — a brand new state of matter.

As reported in the Oct. 7 edition of the journal *Nature*, the researchers present the results of *ab initio* calculations of the hydrogen melt curve at pressures up to 2 million atmospheres.

The measurement of the high-pressure phases of hydrogen has been the focus of numerous experiments for nearly a century. However, the phase boundary that separates the solid and the liquid has remained relatively unknown.

Until now, when scientists Stanimir Bonev, Eric Schwegler, Tadashi Ogitsu and Giulia Galli reported the melt line with



Laboratory research on the melt curve of hydrogen and its relationship to a possible new state of matter made the cover of the Oct. 7 edition of *Nature*.

versus pressure curve has a maximum, which is not directly related to molecular disassociation, but rather to changes in the

See **HYDROGEN**, page 8

first-principles simulations, and proposed new experimental measurements to verify the existence of a maximum melting temperature and the transformation of solid molecular hydrogen to a metallic liquid at pressures close to 4 million atmospheres.

“Our results show that a quantum fluid at around 4 million atmospheres of pressure is possible, at very low temperature” Bonev said.

“Contrary to intuitive expectations, we discovered that the melting temperature

## Bay Area conference lauds labs' homeland security role

By Stephen Wampler  
NEWSLINE STAFF WRITER

OAKLAND — Not only do the national laboratories address immediate homeland security threats, they also focus on possible dangers as far as a decade into the future.

This viewpoint was offered Tuesday by two panelists who spoke on technology perspectives from the national laboratories at the Second Bay Area Conference on Homeland Security.

This week's conference, held at the Oakland Marriott City Center Hotel, was sponsored by the Bay Area

See **HOMELAND**, page 7

## National vaccine shortage delays annual flu clinics and prompts new supply search

Health Services learned early Tuesday morning that one of the manufacturers and suppliers of flu vaccine — Chiron — has had its license suspended by the British government and, as a result, will not be providing any vaccine to its customers, including LLNL, for the 2004-2005 influenza season.

This action will result in the loss of approximately half the expected national vaccine supply.

HSD has been in the queue for flu vaccine since

See **FLU**, page 7

## Final approval pending for last remaining Lab groups to resume work using CREM

The Laboratory is awaiting final approval to restart the last groups that have remained in a stand-down of usage of all electronic classified removable media (CREM).

To date 27 of 29 Lab groups have received the OK from National Nuclear Security Administration headquarters to resume work using CREM. One of the two remaining programs has been validated by the NNSA Livermore Site Office and now awaits final approval from headquarters. The other program has submitted its validation to the site office and must receive LSO approval before being sent to headquarters.

“We expect to be back up and running very soon,” said Bill Bookless, associate director of Safety and Environmental Protection and chair of the committee overseeing the CREM stand-

See **CREM**, page 5

## Lab Science and Technology Awards 2004

By David Schwoegler  
NEWSLINE STAFF WRITER

Laboratory Director Michael Anastasio orchestrated presentation of the fifth annual Science and Technology Awards last Friday before a distinguished Laboratory audience.

Three teams were seated at the awards luncheon in the Grand Canyon Room of Building 543: the Lab's senior management team and the two winning teams selected in the 2004 S&T competition.

The group led by Jerry Britten developed the pro-

See **S&T**, page 8



FRANK NUNEZ/TID

Curly Hoaglan receives an S&T award from Director Michael Anastasio.



Newly spun Web  
— Page 3



Bringing it HOME online  
— Page 3



Genomic mystery of diatoms revealed  
— Page 5





## LAB COMMUNITY NEWS

### Weekly Calendar

Technical Meeting Calendar, page 4

Friday  
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The **Harvest Winemakers dinner** will be today at 6:30 p.m. at White Crane Winery, 5405 Greenville Road, Livermore. The event will feature the San Francisco Bay Area and International Wine Competition wine winners. Cost is \$95 plus tax and gratuity per person and includes hors d'oeuvres, dinner, dessert and drinks. For tickets, call 455-8085 or e-mail to [info@whitecranewinery.com](mailto:info@whitecranewinery.com).

Saturday  
9

There will be a **scheduled power outage** today from 10 a.m. to noon. Bldg. 131 will be affected. Air conditioning, heating and elevators also will be affected. Contact: Mark Cardoza, 3-0490

Sunday  
10

There will be a **scheduled power outage** today from noon to 2 p.m. Bldg. 041 (Sunshine Bldg.) and the Mesquite Post will be affected. Air conditioning, heating and elevators also will be affected. Contact: Mark Cardoza, 3-0490

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The semi-annual **downtown Pleasanton Antiques Street Faire** will be held today from 8 a.m. to 4 p.m. on Main Street. Admission is free. The event is sponsored by the Pleasanton Downtown Association, Frate and Associates and the Valley Times. There will be more than 425 professional dealers from all over the West. For more information, contact Frate and Associates at (760) 724-9400 or the Pleasanton Downtown Association at (925) 484-2199 or [www.pleasantondowntown.net](http://www.pleasantondowntown.net).

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**Robert J. Lang**, internationally known origami artist, author, and engineer will present a slideshow and discuss the industrial and commercial applications of his work in this adult program at 2 p.m. today at the Pleasanton Public Library, 400 Old Bernal Ave. This is a discussion of the industrial and commercial application of origami engineering. For more information on Lange, go to his Website: [www.langorigami.com](http://www.langorigami.com)

Thursday  
14

The University Relations Program cordially invites laboratory scientists, researchers, post-docs and student employees to attend the fifth annual poster presentation by participants in the **SEGRF (Student Employee Graduate Research Fellowship) Program** today from 3-5 p.m. in the West Cafeteria. For more information, call Joanna Allen in the University Relations Program office, 3-9225.

Up  
&  
Coming

The Oct. 20 Macintosh Technical Seminar Series will feature "**System Administration with Apple Remote Desktop 2**," by Michael Lopp of ARD, at 10:30 a.m., Bldg. 543 auditorium. Contact Duane Straub, 2-9774.

## Public relations efforts earn awards

The Laboratory was recently honored with two communication awards from the Public Relations Society of America.

"Edward Teller Remembered," a short video documenting the life of Teller, and the press materials for the Lab's Homeland Security Office both received Compass Awards from the Northern California chapter.

The video received the society's highest honor in the Audio Visual — Internal Video Programs category.

The video, produced by Public Affairs and the Lab Television Network (LLTN), was shown as part of the Edward Teller memorial celebration last November. Teller died in September. Mimi Alford of LLTN and Lynda Seaver and Gordon Yano, both from Public Affairs, accepted the award. The video was put together by Alford and Seaver.

The homeland security press kit was honored in the Press Kits/Media Kits — Services category. Steve



JACQUELINE MCBRIDE/NEWSLINE

PRSA winners (clockwise from lower left): Kelly Spruiell, Gary Graff, Leonard Walton, Steve Wampler, Jerry Johnson, Mimi Alford, John Danielson, Kirk Hadley, Maria Fogle and Lynda Seaver.

Wampler of Public Affairs and Leonard Walton of the Homeland Security Office, accepted the award. Those who worked on the press kit include Wampler, Lauren Devore, Kirk Hadley, Maria Fogle, Kelly Spruiell, Bob Smith, Nancy Rutter, Gorgiana Alonzo, John Danielson, Walton, Gary Graff, Jerry Johnson and Melissa Villarante.

The PRSA awards honor communication and public relations programs and projects throughout Northern California.

## IN MEMORIAM

### Anne Dramita (Pannell) Mego

Former Fremont resident Anne Dramita (Pannell) Mego died Oct. 3. She was 70.

Born Feb. 2, 1934, in Roff, Okla., Mego moved to Visalia and then to Fremont, where she raised her family from 1956-1969. During those years, she attended First Presbyterian Church and was a member of the Order of Eastern Star, Orient Chapter 177.

Mego later moved to Livermore and Manteca before settling in Tracy, where she lived for 13 years.

An administrative assistant at the Lab for more than 10 years, Mego enjoyed studying art, tracing genealogy and performing philanthropic work.

She is survived by her daughters, Donna Terry of Stockton and Kathleen Winchell of Tracy; her son Clif-

ford Terry of Stockton; four grandchildren and three great-grandchildren.

She was preceded in death by her husband, Lewis Mego, and her brother, Welland Pannell.

A funeral service will be held today (Oct. 8) at the Masonic Temple, 1601 N. Tracy Blvd., Tracy. Mego will be buried at the San Joaquin National Cemetery in Gustine.

The family requests donations be made to the Tracy Area Genealogical Society, 1141 Adam St., Tracy, CA 95376.

### Evelyn M. McArthur

Evelyn Maxine McArthur died Wednesday, Sept. 29. She was 78.

McArthur was born and raised in Texas. She moved to California in 1942.

McArthur started at the Laboratory in 1965 and after 22 years retired in 1987 as an administrative assistant in the Chemistry and Materials Science Directorate.

After retirement she moved to Manteca; previously she lived in Pleasanton and Livermore.

She was a member of the Church of Jesus Christ of Latter-day Saints. She enjoyed painting, gardening, camping and fishing.

She is survived by her son, Kenneth McArthur of Manteca; three grandchildren and eight great-grandchildren.

Services and burial were private.

Remembrances may be made to any Church of Jesus Christ of Latter-day Saints.

## Newsline

*Newsline* is published weekly by the Internal Communications Department, Public Affairs Office, Lawrence Livermore National Laboratory (LLNL), for Laboratory employees and retirees.

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## AROUND THE LAB



# Overhaul gives Laboratory Web presence a new look

The top levels of the Laboratory's external Website have been given an overhaul, including a fresh new look, updated content and features, and a new navigational structure.

Roger Cuning of the Director's Office, who led an External Web Redesign workgroup with representation from across the Lab's directorates and programs, said the changes were designed to modernize and update the Website and to "emphasize the Laboratory's highest priority objectives" by highlighting LLNL's science, technology and mission.

Additional objectives included improving the ability of target audiences to locate relevant information about the Laboratory, improving ease of navigation and search results, and providing tools to make it easier for content providers to keep their information up-to-date.

"One of the key target audiences identified by the workgroup was potential job candi-



Located on the Web at [www.llnl.gov](http://www.llnl.gov), the Lab's new external home page has a new look, updated content and features and a new navigational structure.

dates," Cuning said. "So we developed a mechanism to help job-seekers quickly identi-

Lab and links to information about Livermore and the Tri-Valley area are also featured.

fy openings in their particular career fields."

The workgroup created summary pages for each directorate and program office, with short descriptions of its missions and programs and a search feature that locates job openings within that specific directorate or program.

The Lab's redesigned home page, at [www.llnl.gov](http://www.llnl.gov), features a photo linking to the current "top story" at the Lab.

The home page also links to descriptions of LLNL's mission and research programs, educational activities, organization and management, opportunities for business and research collaboration, institutional publications and the library, community outreach activities, science and technology highlights, and current news releases.

## HOME schooling



JACQUELINE MCBRIDE/NEWSLINE

Livermore High School teacher Linda Lamoureux helps student Mary Borrillo with a work assignment in Livermore High's Special Day Class (SDC). Livermore High supports four special education classes for about 72 high school students with special educational needs. This class offers vocational and academic support, prepares students for life beyond high school and supplies all books and class materials. The SDC is one of the agencies employees may donate to through the HOME Campaign.

## 2004 HOME Campaign early donation period begins this Monday

Beginning Monday, Laboratory employees have an opportunity to donate electronically to the HOME (Helping Others More Effectively) Campaign prior to the Run for HOME.

Although employees will be able to donate electronically throughout the entire HOME Campaign, which ends Dec. 10, this period from Oct. 11-22 is called the "early donation period." Employees who donate online during this period may elect to not receive a booklet and save the cost and handling associated with it.

In addition, the first 500 employees who donate online will receive an official 2004 Olympic pin (shown below) to be picked up at the agency fair and HOME run on Thursday, Oct. 28. Once employees donate online they are automatically eligible for all of the weekly incentive drawings.

A computer and printer are set up in the Bldg. 151 lobby for those who wish to donate online and do not have access to a computer. New online features include printing a receipt, one-time payroll deduction, as well as donating in tax years 2004 and 2005.



as well as donating in tax years 2004 and 2005.





## NEWS YOU CAN USE

### Work/life balance focus of talk

Denise Larsen, a marriage and family therapist, will present "The Road to Balance: Your Work and Personal Life" at noon Thursday, Oct. 14 in the Bldg. 543 auditorium.

The presentation will explore the stressors that occur when trying to combine career and family life; consider the attitudes, beliefs and myths that help or hinder us in our daily activities and learn strategies for dealing with work and personal stress.

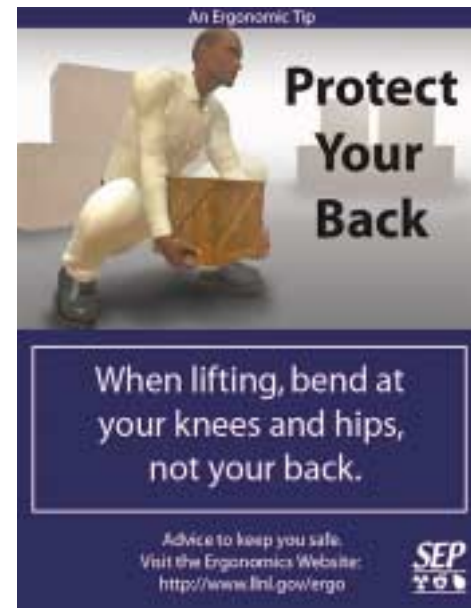
Larsen provides individual, group



and family therapy and has been a trainer for CONCERN: Employee Assistance Program, conducting seminars for corporations and municipalities.

Resources on employee services in support of work/life will be available at the presentation, which is sponsored by the Work-life Program Office and Work-life Advisory Council.

For more information, contact Carol Sandoli, 2-9543.



## Technical Meeting Calendar

Friday  
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### INSTITUTE FOR GEOPHYSICS & PLANETARY PHYSICS

"GALEX: A Year Exploring The UV Universe," by

Christopher Martin, Caltech. Noon, Bldg. 319, room 205. All attendees need to be badged. Contact: Wil van Breugel, 2-7195, or Rachael Mills, 2-6333.

### INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

"A Progressive Environment for Geometric and Physical Modeling: Working Progress," by Alberto Paoluzzi, Third University of Rome. 10 a.m., Bldg. 451, room 1025 (property protection area). For more information, go to <http://www.llnl.gov/casc/calendar.shtml>. Contact: Valerio Pascucci (CASC), 3-9422, or Leslie Bills, 3-8927.

Monday  
11

### CHEMICAL BIOLOGY & NUCLEAR SCIENCE/ BIOSECURITY & NANOSCIENCES LABORATORY

"Self-Assembling Cyclic Peptide Nanotubes as Transmembrane Channels: From Chemical, Biological, and Application-Oriented Perspectives," by Hui Sun Kim, Department of Chemistry, UC Santa Barbara. 2 p.m., Bldg. 151, room 1209, Stevenson Room. Foreign nationals may attend if approved plan is on file, which includes Bldg. 151. Contact: Jim De Yoreo, 3-4240, or Katie Thomas, 2-7903.

Tuesday  
12

### NANOSCALE SYNTHESIS & CHARACTERIZATION LABORATORY

"Processing and Properties of Metallic Foams," by David C. Dunand, Northwestern University. 9:30 a.m. Bldg. 235, room 1090 (uncleared area). Contact: Andrea Hodge, 4-3715, or Kathy Silva, 4-2597.

### COMPUTATION

Scientists in AX Division recently completed a science run on the LC Thunder

machine that simulated one of the first experiments on the NIF laser. Presented by Steve Langer, AX Division. 10 a.m., Bldg. 451, room 1025. Contact: Jean Shuler, 3-1909.

Wednesday  
13

### PHYSICS & ADVANCED TECHNOLOGIES

"A Surrogate Reaction Technique Benchmark: 92-ZR (alpha, alpha) Surrogate for N+91-ZR," by Jennifer Church, N Division. 1:30 p.m., Bldg. 211, room 227 (badge required). Contact: Florann Mahler, 2-9173.

### INSTITUTE FOR SCIENTIFIC COMPUTING

"AntiPatterns in Software Configuration Management," by Juan Hernandez, LLNL. 10 a.m., Bldg. 451, room 1025 (property protection area). Contact: Juan Hernandez, 2-0347, or Leslie Bills, 3-8927.

### CHEMICAL BIOLOGY & NUCLEAR SCIENCE DIVISION

Applicant seminar: "On-Chip Separation, Mixing in Microfluidics and Nanogap DNA Junction," by Mingqiang Yi, UC Berkeley. 10 a.m., Bldg. 151, room 1209. Foreign nationals may attend if appropriate security plan is on file, which includes Bldg. 151. Contact: Aleksandr Noy, 4-6203, or Eryn Davis, 2-0475.

Thursday  
14

### STUDENT EMPLOYEE GRADUATE RESEARCH FELLOWSHIP

University Relations Program invites Laboratory scientists, researchers, post-docs and student employees to attend the fifth annual poster presentation by participants in the SEGRF Program. 3-5 p.m., West Cafeteria. Contact: Joanna Allen, 3-9225.

### BIOLOGY & BIOTECHNOLOGY RESEARCH PROGRAM

"Development of a Low Density Array for Gene Expression: Use of Genomic Assays in the Detection of Renal Allograft Rejection," by Ted Rigl, BBRP. 10:30 a.m., Bldg. 361 auditorium. For the complete schedule of seminar speakers, including titles, abstracts and supporting information, visit [http://doves.llnl.gov/bbrp\\_semi](http://doves.llnl.gov/bbrp_semi)

nars/. Refreshments will be served 10 minutes prior to the seminar. Contact: Alice Yamada, 2-4723, or Nancy Wrigley, 3-6287.

### CENTER FOR BIOTECHNOLOGY, BIOPHYSICAL SCIENCES & BIOENGINEERING/ BIOSECURITY & NANOSCIENCES LABORATORY

"Plasmons in Metallodielectric Nanostructures," by Peter Nordlander, professor of Physics, Electrical and Computer Engineering, Rice University. 2-3 p.m., Bldg. 123, conference room A. Contact: Thomas Huser, 3-6952, or Rose Gardner, 2-2317.

Friday  
15

### ENGINEERING /CENTER FOR COMPUTATIONAL ENGINEERING

"Regional Wind Field Classification Employing Cluster Analysis and Principal Component Analysis," by Lee Glascoe, Ron Glaser and Gwen Loosmore. 10 a.m., Bldg. 235, room 1090 (Gold Room). Contact: Ann Tyler, [tyler8@llnl.gov](mailto:tyler8@llnl.gov), to obtain the abstract.

### INSTITUTE FOR GEOPHYSICS & PLANETARY PHYSICS

"The Youngest Neutron Stars," by David Hefland, Columbia University. Noon, Bldg. 319, room 205. All Attendees need to be badged. Contact: Wil van Breugel, 2-7195, or Rachael Mills, 2-6333.

### INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

"Performance Prediction and Optimization Using the SDSC PMAc Framework," by Elizabeth Simon, San Diego Supercomputer Center. 10 a.m., Bldg. 451, room 1025 (property protection area). For more information, go to <http://www.llnl.gov/casc/calendar.shtml>. Contact: John May, (CASC) 3-8102, or Leslie Bills, 3-8927.

The deadline for the next Technical Meeting Calendar is noon, Wednesday.



## NEWS OF NOTE



## Consortium's tree DNA sequencing effort proves poplar

By David Gilbert

NEWSLINE STAFF WRITER

An international consortium led by the Department of Energy Joint Genome Institute (JGI) and Oak Ridge National Laboratory has released the first complete DNA sequence of a tree, *Populus trichocarpa*, the Black Cottonwood or poplar, one member of the most ecologically and commercially valuable group of trees in North America.

"The poplar genome sequence will provide researchers with a critical resource to develop faster growing trees, trees that produce more biomass that can be converted to fuels, and trees that can sequester more carbon from the atmosphere or be used to clean up waste sites," Secretary of Energy Spencer Abraham said.

The DOE Office of Science provided a total of \$12 million for the two-year poplar initiative.

Renowned for their vigor, poplars can grow over a dozen feet a year, topping off at 200 feet and six feet in diameter. DOE estimates that by 2050, with improvements in plant productivity and conversion efficiencies, 25 percent of U.S.-imported oil could be displaced by plantation-grown trees.

Poplar was chosen as the first tree DNA sequence decoded because of its relatively compact genetic complement, some 40 times



Young hybrid poplar trees.

smaller than the genome of pine. With a genome consisting of more than 480 million letters of genetic code, *Populus trichocarpa* is four times larger than the genome of the first plant sequenced, *Arabidopsis thaliana*, the tiny weedy workhorse for plant molecular geneticists. Rice, the only other plant to be sequenced thus far, is about 430 million bases.

The tree DNA actually sequenced was isolated from a Black Cottonwood specimen collected along the banks of the Nisqually River in Washington State.

"In our initial analysis we found more than 40,000 genes, most related to genes in other plants," said Dan Rokhsar, JGI computational genomics department head. "The trick will be in figuring out how these similar genes have been customized and redeployed in poplar to generate a large woody plant instead of a small weed."

Additional JGI contributors to the poplar project include Nik Putman, Igor Grigoriev, Paul Richardson and Susan Lucas.

The poplar promises to have a role in carbon management by harnessing its built-in mechanism for storing captured carbon dioxide in its leaves, branches, stems and roots. This natural process suggests opportunities to further clean up the air by engineering trees to more effectively shuttle and store more carbon below ground in their roots and the soil.

## Ocean algae's genome reveals role in mediating global warming

By David Gilbert

NEWSLINE STAFF WRITER

The Department of Energy Joint Genome Institute (JGI) has generated the first genetic instruction manual of a diatom, from a family of microscopic ocean algae that are among earth's most prolific carbon dioxide assimilators.

This work, published in the Oct. 1 issue of the journal *Science*, has yielded important insights on how the creature *Thalassiosira pseudonana* absorbs the major greenhouse gas CO<sub>2</sub> in amounts comparable to all the world's tropical rain forests combined.

"Now that we have a glimpse at the inner workings of diatoms, we're better positioned to understand the role they and other phytoplankton play in mediating global warming," said Dan Rokhsar, one of the co-authors and head of computational genomics at the JGI.

Virginia Armbrust, a University of Washington associate professor of oceanography and the paper's lead author, said that the single-celled diatoms generate as much as 40 percent of the 50 billion to 55 billion tons of organic carbon produced each year in the sea. In the process they use carbon dioxide and produce oxygen.

"We discovered they have a urea cycle, something no one ever suspected," Armbrust said.

A urea cycle is a nitrogen waste pathway found in animals but has never before been seen in a diatom. Nitrogen is crucial for diatom growth and is often in short supply in seawater.

Only three or four microns in width, as many as 70 *Thalassiosira pseudonana* could fit



A diatom.

in the width of a human hair. They are encased by a frustule, a rigid cell wall delicately marked with pores in patterns distinctive enough for scientists to tell the species apart.

"Diatoms can manipulate silica in ways that nanotechnologists can only dream about. If we understood how they can design and build their patterned

frustule as part of their biology, perhaps this could be adapted by humans," Rokhsar says.

There are 46 researchers from 26 institutions working on the project, including JGI's Diego Martinez, Nicholas Putnam, J. Chris Detter, Tijana Glavina, David Goodstein, Uffe Hellsten, Susan Lucas, Mónica Medina, and Paul Richardson.

### CREM

Continued from page 1

down and inventory.

Energy Secretary Spencer Abraham ordered the stand-down of all Department of Energy facilities using CREM back in July. DOE laboratories and facilities were ordered to do wall-to-wall inventories of all accountable CREM and assess security and inventory procedures before receiving approval for restart.

"We found everything we were looking for," Bookless said.

As part of the process the Laboratory conducted extensive inventories — "counting everything three times to assure everything that needed to be put into accountability is now under accountability." Bookless explained that during the inventory the Lab came across legacy materials that previously were not identi-

fied as CREM. They have been entered into accountability.

"It was very thorough search, and in the process we identified a number of ways to sustain our level of confidence in how we handle our CREM."

Bookless will work with Dave Leary, associate director of Laboratory Services, who will appoint a special team to work on continuous process improvements. "We want to make sure that we don't get complacent," Bookless said. "We want to continue to tackle the little details and ensure what we are doing with our CREM is the right thing."

Bookless said the stand-down took the Lab more time than he originally expected, but attributes that to the Lab's own desire for an extensive review. "We wanted to make sure we were consistent and complete with every administrative detail," he said.

Bookless credits the stand-down committee

as well as everyone involved in the inventory processes, particularly the classified administrative specialists (CAS) who worked on much of the inventory and validation. Director Michael Anastasio recently honored each CAS with a special Director's Office award for their efforts.

Bookless also thanked the Livermore Site Office, which worked closely with the Lab to ensure the Lab's approaches to CREM validation were acceptable to headquarters.

"The way everyone pulled together to tackle every detail was fantastic," Bookless said.

Now that the stand-down is almost complete, Bookless reminded all employees to know their classified administrative specialists, to understand the various protocols for handling CREM, to seek out necessary training and to consult Computer Security (2-4655) or the Classified Document Program Office (3-8119) for additional help.





## HOMELAND SECURITY

Continued from page 1

Economic Forum (BAEF) and the Bay Area Science and Innovation Consortium (BASIC). It attracted about 150 emergency professionals, health officers, state homeland security officials, business representatives and others.

"The national labs are set up to think about threats five to 10 years out," said Don Prosnitz, deputy director for LLNL's Homeland Security Organization.

His assessment was seconded by Rick Stulen, the director of the Exploratory Systems and Development Center at Sandia Livermore.

"One of the things that the national laboratories represent, or bring to the table, is the anticipation of what we're going to need tomorrow, not just what we have today."

Prosnitz and Stulen were joined on the national laboratory technology panel by Piermaira Oddone, deputy director of Lawrence Berkeley National Laboratory, and Peter Friedland, chief technologist at the NASA Ames Research Center.

In his presentation, Prosnitz highlighted an LLNL research initiative that, if successful, could help counter engineered biotreatments, and discussed the challenges of identifying individuals.

The research initiative under way — called pathomics — may allow a rapid diagnosis of infection one to two days after exposure, rather than waiting days or weeks for symptoms to appear.

"With biology, when we actually know what's happening, with advanced medicine, we can often treat people," Prosnitz told the audience. "We've seen that with anthrax."

As of the end of September, the United States has started fingerprinting people who enter the country using passports (visa-waiver countries).

"The first question people ask is: You don't have fingerprints of the terrorists, so why are you doing the fingerprinting," Prosnitz noted.

"Over the long course of time, we'll end up with lots of fingerprints. This will prevent people from being able to change their identities, or assume multiple identities."

Since there are some 500 million visitor entries into the United States every year, Prosnitz emphasized that whatever system is adopted needs to work very rapidly, or there will be huge backups.

The threat, status and challenges of another important homeland security area — detecting explosives — were examined by Stulen. He noted the widely different scales of impact from conventional and nuclear explosives.

One of the largest vehicle bombs, at Oklahoma City, killed 168 people and injured 400 to 600. By contrast, 80,000 people died at once at Hiroshima, with another approximately 150,000 succumbing in the later months and years, Stulen said.

The three faces of today's explosive threats, he said, are suicide bombers that kill tens of people; large vehicle bombs, such as the ones that hit the USS Cole and Oklahoma City; and remotely detonated devices, where the perpetrators remain 100 to 200 yards from the device that they activate.

Two of the principal problems with explosives are that they are easy to obtain and difficult to detect, according to Stulen.

"Our biggest problem, as we look to the future, is the standoff detection of explosives, that is being able to detect at a distance of 10 meters or more,"

Stulen said.

NASA Ames' Friedland described how his laboratory had created a Disaster Assistance Response Team (DART) for helping rescue people in collapsed buildings. The team, Friedland said, provided assistance in the Oklahoma City and September 11 rescue efforts.

In May of this year, NASA Ames held a one-week workshop on collapsed structure responses for technologists and emergency responders that attracted about 60 people.

One of nine serious technology candidates to emerge from the workshop, according to Friedland, was LLNL's micropower impulse radar (MIR), which can detect the motion of breathing through thick materials, including reinforced concrete.

The panel's moderator, Paul Saffo, a director at the Menlo Park-based Institute for the Future, also offered his thoughts on the Livermore MIR technology.

"LLNL (has) created an astounding technology — micropower impulse radar. I'm sure none of you woke up this morning feeling my life is incomplete without a personal radar. But if you're an emergency response professional, it is. Imagine a pocket-sized radar that can let you look through walls or do medical diagnostics."

Saffo also pointed out that people in the Bay Area tend to overlook the "extraordinary firepower intellectually" of the area's three Department of Energy national labs.

Tuesday's conference included three other sessions: "National Priorities and Local Security: The Changing Federal Role," "Building State and Regional Preparedness," and "Crisis Management: Leveraging Public and Private Resources."

## FLU

Continued from page 1

early this year. Distribution of vaccine from the other U.S. vaccine manufacturer — Aventis — has been put on hold by the U.S. government. Health Services has requested 3,500 doses of vaccine from Aventis and is awaiting word of its possible release. HSD will keep Lab staff updated as more information is provided.

According to the U.S. Department of Health and Human Services: "Our immediate focus will be on making sure that the supply we do have reaches those who are most vulnerable. We will need the help of the public, the public health community and the medical community to make sure that the vaccine goes to those who truly need it most."

Because of this urgent situation, the Centers for Disease Control (CDC) has issued interim recommendations for influenza vaccination during the 2004-05 season. These interim recommendations take precedence over earlier recommendations. See [www.cdc.gov/flu](http://www.cdc.gov/flu) for details on these recommendations, as well as other flu-related information.

### Priority groups for influenza vaccination

The following priority groups for vaccination with inactivated influenza vaccine this season are considered to be of equal importance:

- All children aged 6-23 months (new guideline this year).
- Adults aged 65 years and older.
- Persons aged 2-64 years with underlying chronic medical conditions.
- All women who will be pregnant during the influenza season.

## Other sources of flu vaccine

Because of the uncertainty of vaccine availability, Dr. Jim Seward, Lab medical director, encourages LLNL staff who fit within the new CDC recommendations to obtain vaccine wherever they can, including through their health plans or local clinics. However, since local clinics may be facing a shortage of vaccine as well, you may want to call in advance for vaccine availability. Check Maxim Health Systems Website <http://www.maximflu.com/> for the locations of flu clinics in your area.

Health Services is available to answer questions and provide additional information at 2-7459.

- Residents of nursing homes and long-term care facilities.
- Children aged 6 months-18 years on chronic aspirin therapy.
- Health-care workers involved in direct patient care.
- Out-of-home caregivers and household contacts of children aged under 6 months.

### Other vaccination recommendations

Persons in priority groups identified above should be encouraged to search locally for vaccine if their regular health-care provider does not have vaccine available.

Intranasally administered, live, attenuated influenza vaccine, if available, should be encouraged for healthy persons who are aged 5-49 years and are not pregnant, including health-care workers (except those who care for severely immunocompromised patients in special care units) and persons caring for children aged under 6 months. Note: LLNL had not planned to dispense FluMist because it is only indicated for a small percentage of our population.

Certain children aged under 9 years require two doses of vaccine if they have not previously been vaccinated. All children at high risk for complications from influenza, including those aged 6-23 months, who present for vaccination, should be vaccinated with a first or second dose, depending on vaccination status. However, doses should not be held in reserve to ensure that two doses will be available. Instead, available vaccine should be used to vaccinate persons in priority groups on a first-come, first-serve basis.

### Vaccination for non-priority groups

Persons who are not included in one of the priority groups described above should be informed about the urgent vaccine supply situation and asked to forego or defer vaccination.

### Who should not receive influenza vaccine

Persons in the following groups should not receive influenza vaccine before talking with their doctor:

- Persons with a severe allergy (i.e., anaphylactic allergic reaction) to chicken eggs.
- Persons who previously had onset of Guillain-Barré syndrome during the six weeks after receiving influenza vaccine.

SOUTH LAKE TAHOE - 3Bedroom 2 Bath Chalet, comfortably furnished, all amenities, Enjoy fall colors in Tahoe!! Off-Season Rates! RESERVE NOW! 209-599-4644

Maui, HI - Kahana Reef oceanfront 1BR/1BA condominium. Beautiful two-island view, oceanside pool, and BBQs. LLNL rates for year-round reservations. 925-449-0761

Truckee Tahoe Donner - ski cabin group has openings. \$625 per person, unlimited

access. Thanksgiving - April 30. Call for additional information 925-447-0596

Solana Beach/Del Mar - Oceanfront condo, deluxe 2 br., 2 1/2 ba., fully equiped, tennis, pool, jacuzzi, gated and covered parking, near San Diego attractions. 925-443-2271

Shaver Lake - Mountain house, sleeps 10 comfortably. \$200 night, gameroom, pool table, snow, water ski fishing, pictures available 510-909-3861

## WANTED

Moving help - strong person with truck to move treadmill, couch, big bookcase Milpitas to Livermore. 408-930-6175

Are you remodeling? I need Kitchen Cabinets in good condition. All sizes. 925-550-3809

Need inexpensive (cheap) Bass amp for weekend warrior jam sessions, does your

amp need a new home? Call me! 209-832-3069

24 foot extension ladder 925-513-7416

Golf Clubs -- your broken-in 3.5 fairway woods now sitting in the garage. 510-486-8750

Seeking versatile, experienced vocalist for newly formed music group. Stylistically, think Steely Dan meets the blues w/ horn section. 925-634-3357

Recumbent 2 wheel bicycle for 6 foot 220 pound person. 925-829-5975

Do you have a Apple G4 in good condition at a reasonable price. Please give me a call at 209-234-2314

Tutor needed for my son who is 14y old in 8th grade. High school student is okay. 925-449-1340

## Greenville to close for 10 months starting Monday

Greenville Road will close to through traffic beginning Monday, Oct. 11, south of the National Drive intersection and north of the Marathon Drive intersection.

The closure facilitates a City of Livermore construction project to widen Greenville Road and replace the Union Pacific Railroad bridge. However, there will be no anticipated effect to ACE train schedules.



To minimize traffic delays caused by construction detours on Greenville Road, Livermore and Sandia employees should choose alternate commute routes and allow 20-30 minutes additional commute time to get to and from the labs during construction.

Livermore traffic engineers advised that traffic will remain unsettled for the first two weeks of the closure and detour, as commuters experiment with

alternate routes.

Employees should plan their workdays, medical appointments, day care pick-ups and drop-offs and other commute-related endeavors accordingly through next August.

The City of Livermore offers updates on the project at <http://www.ci.livermore.ca.us/eng/roadwork.html#Greenville>.

See the Oct. 1 edition of *Newsline* for alternate routes.

## HYDROGEN

*Continued from page 1*

intermolecular interactions in the fluid phase, occurring at high pressure.”

The team’s calculations not only predict a maximum in the melt line, but also provide a microscopic model showing its physical origin in changes in the intermolecular interaction — significantly different from earlier models. Based on their new understanding for the physics behind the melting of hydrogen, the researchers are able to propose new experi-

ments to measure the solid-liquid phase boundary.

The calculated melt curve of hydrogen is between 500,000 atmospheres and 2 million atmospheres of pressure. Above about 800,000 atmospheres of pressure, the melt line goes from a positive to a negative slope — a phenomenon that is related to a softening of the intermolecular interactions and to the fluid and solid becoming very similar in structure and energy at high pressure. This change from a positive to a negative slope is gradual and is not directly related to molecular disassociation, as previously speculated.

“Our results provide strong evidence toward the existence of a low-temperature quantum fluid in hydrogen,” Bonev said. “The existence of a maximum melting temperature is a unique physical phenomenon in a molecular solid with a close packed structure.”

The simulations carried out by the Livermore team are very complex and sophisticated, and required the use of large-scale parallel quantum simulation codes, such as the LLNL GP ab-initio molecular dynamics code, written by Francois Gygi in the Computation Directorate.

## S&T

*Continued from page 1*

cessing methods and tooling that produced both the world’s largest multilayer dielectric reflection grating and the world’s highest laser damage-resistant gratings. This technology provides

optics for high-energy, short-pulse lasers. Until this breakthrough, no gratings were available for any of these lasers. Britten’s team included Hoang Nguyen, Thomas C. Carlson, Leslie M. Jones, Leslie J. Summers, Curly R. Hoaglan, Michael D. Aasen, James D. Nissen and James E. Peterson.

Another team led by Guilia Galli was

selected for their discovery of Bucky-diamond and unraveling the atomic structure of silicon and germanium nanoparticles. The research focuses on how the properties of materials change as they are squeezed and made smaller. Galli believes that this research can lead to the use of nanoparticles to sense the environment. Other members included Jeffrey C. Grossman, Anthony W. Van Buuren, Andrew J. Williamson, Louis J. Terminello, and Francois Gygi.

Established in 2000, the Lab’s Science & Technology Awards are given annually for notable achievements in science and technology. As part of the annual institutional awards program, the recognition brings with it a monetary award and memorabilia presented to individuals selected by senior management.



FRANK NUNEZ/TID

Top photo, from left to right: Francois Gygi, Michael Anastasio, Guilia Galli, Andrew Williamson, Anthony Van Buuren and Jeff Grossman.



Above, from left to right: James Nissen, Leslie Jones, Hoang Nguyen, James Peterson, Jerry Britten, Tom Carlson, Michael Anastasio, Curly Hoaglan, Leslie Summers and Mike Aasen.



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