

# NEWSLINE

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Friday, August 12, 2005

Vol. 30, No. 32

## Tropical temperatures on the rise



New research shows that climate observations and computer models are finally in sync that temperatures in the tropics are rising.

By Anne M. Stark

NEWSLINE STAFF WRITER

For the first time, new climate observations and computer models provide a consistent picture of recent warming of the tropical atmosphere.

Over the past decade, scientific evidence from a variety of sources has implicated human-

caused increases in greenhouse gases as a major driver of recent climate change. A key argument used to rebut such findings relates to satellite records of temperature change in the troposphere — the lowest layer of Earth's atmosphere.

Until recently, climate modelers compared

See CLIMATE, page 8

## Governor reappoints Biosciences' Jim Felton to state science board

By Charlie Osolin

NEWSLINE STAFF WRITER

Veteran biologist Jim Felton of the Laboratory's Biosciences Directorate has been reappointed by California Gov. Arnold Schwarzenegger to the Carcinogen Identification Committee of the State Science Advisory Board.

Felton, a molecular biologist who has served on the panel for the past 10 years, is an expert on cancer causation and prevention and heads an LLNL group studying the health consequences of mutagens in foods. Felton also serves as associate director for cancer control at the UC Davis Cancer Center.



Jim Felton

Felton is one of nine University of California-affiliated scientists named to two committees of the Science Advisory Board, which provides scientific advice to the state Office of Environmental Health Hazard Assessment. Among them is David Eastmond, a former postdoctoral fellow at LLNL, who is now a professor and chair of the Environmental Toxicology Graduate Program at UC Riverside. Eastmond joins Felton on the Carcinogen Identification Committee. The appointments do not require Senate confirmation and do not pay a salary.

"This has been a very interesting committee over

See FELTON, page 8

## Chemical industry advances in technology and science make weapons' monitoring difficult

By Stephen Wampler

NEWSLINE STAFF WRITER

Technological advances within the chemical industry could erode the effectiveness of the Chemical Weapons Convention's provisions for verification and compliance.

That assessment is offered by Tuan Nguyen, the Herbert York Fellow at the Laboratory's Center for Global Security Research, in a paper published today (Aug. 12) in the journal *Science*. (The York Fellowship honors the Laboratory's first director, who is now director emeritus of the Institute on Global Conflict and Cooperation at UC San Diego).

See MONITORING, page 7

## Research links bombs to brain cells

By Anne M. Stark

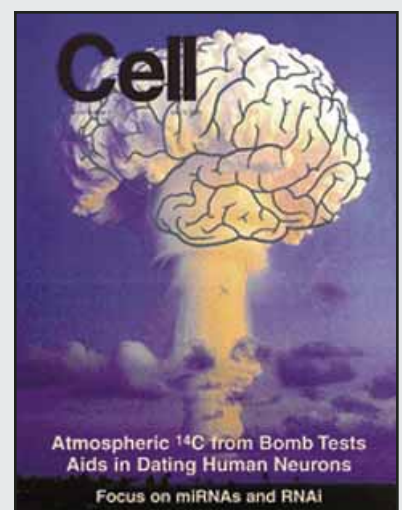
NEWSLINE STAFF WRITER

It seems peculiar that looking at the atmospheric content of carbon before and after above ground nuclear testing could tell us something about the age of our brain cells.

But that's exactly what Bruce Buchholz of the Laboratory's Center for Accelerator Mass Spectrometry (CAMS) and colleagues from the Karolinska Institute in Sweden did.

The researchers applied carbon dating to DNA to confirm that cells in the brain live longer than most others. Carbon dating is typically used in archeology

See CAMS, page 7



9/80 summer schedule in place

— Page 3



Construction aims to restore arroyo

— Page 5



Posters are a hit with employees

— Page 8



## LAB COMMUNITY NEWS

### Weekly Calendar

Technical Meeting Calendar, page 4

**Tuesday**  
**16**

Today is the last day to donate items for the “**Back-2-School Giveaway**” collection supported by the HOME (Helping Others More Effectively) Campaign Committee as part of the “LLNL at HOME in our Community” activities. Items needed include pencils, pens, markers, crayons, glue sticks, backpacks, binders, paper, rulers, calculators, gift certificates for shoes and gift certificates for haircuts. Donation stations are located in Bldg. 132N lobby, Bldg. 361 lobby, Bldg. 571 south entrance, and Site 300, Bldg. 871. For more information, contact Chelle Clements, 3-8134.

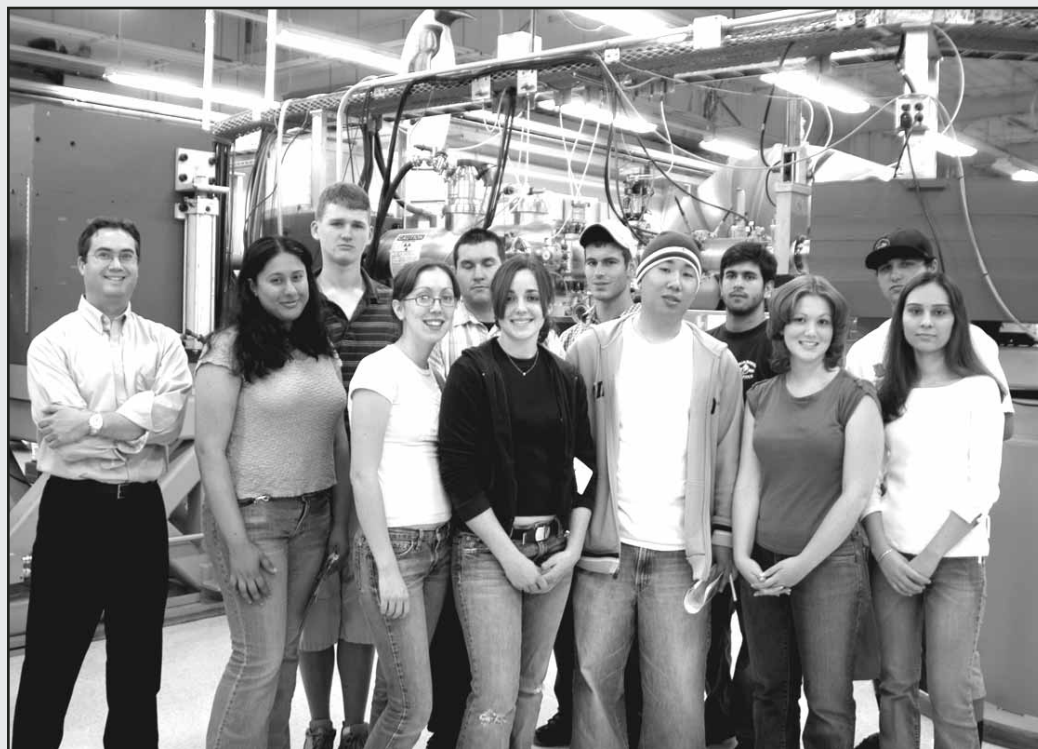
**Wednesday**  
**17**

The **Lab’s Traffic Safety Committee** advises commuters who travel the Vasco Road safety corridor that they are invited to the next community planning meeting to improve this dangerous section of highway to be held today at 7 p.m. at the Brentwood Police Station conference room, 9100 Brentwood Blvd. To add agenda items, contact the meeting host, Officer Scott Yox, California Highway Patrol, Contra Costa Area Public Affairs, 5001 Blum Road, Martinez or call (925) 646-4980.

**Thursday**  
**18**

The **Amigos Unidos Hispanic Activities Group** will again offer weekly Spanish classes at the Lab. A continually growing number of employees interested in learning Spanish has boosted the class roster to more than 40 active students. An information session will be held today at noon, in Bldg. 571, room 1301. Fall classes are currently scheduled to begin the week of Sept. 12.

### College comes to CAMS



BOB HIRSCHFELD/NEWSLINE

Brad Pesavento (far left) of the Lab’s Biosciences Directorate escorted a group of students from the Las Positas College chemistry class he instructs on a tour of the Lab’s Center for Accelerator Mass Spectrometry (CAMS) this week. The students also visited NIF and the Discovery Center.

### Changes proposed to Lab’s workweeks, sick leave

The following are proposed changes being made to the *Personnel Policy and Procedures Manual*. These changes were announced via memo to senior managers from Jan Tulk, associate director of Administration and Human Resources this week. These modifications represent substantial changes. Employees are being asked to review the changes and provide comment. The deadline to submit comments is Aug. 31. The proposed changes include:

#### *Section L—Hours of Work, Extended Workweeks*

Notice was previously provided on proposed changes to the Laboratory extended workweek related policies and procedures. Information on these proposed changes has been available at [http://www-r.llnl.gov/human\\_resources/hrsvcs/policydocs.html#eww](http://www-r.llnl.gov/human_resources/hrsvcs/policydocs.html#eww)

The primary purpose of these changes is to: clarify the circumstances in which monthly-paid employees are eligible for pay for extended workweeks; improve the Laboratory’s ability to track use of extended workweeks pay for monthly-paid employees; and ensure that all instances of extended workweeks pay meet the criteria of Laboratory

policy.

The previous proposal has been modified to clarify that if a Laboratory holiday falls within an extended workweek, the holiday hours will apply toward the 56 effort hours calculation.

#### *Reimbursement of sick leave for Workers’ Compensation related medical appointments*

The Laboratory will be ending the practice of reimbursement of sick leave for incremental hours for medical appointments for work-related injuries or illness. The University has deemed these payments to be inappropriate and has directed the Laboratory and other UC locations to terminate this practice. Absences for medical appointments will be treated alike, regardless of whether they are the result of occupational or non-occupational injury or illness. Employees may use accrued sick leave to make up for time lost due to such appointments. Managers also are encouraged to work out flex-time arrangements with affected employees.

Employees are encouraged to submit comments to Tish Rzeszutko in the Office of HR Planning and Policy at 2-6597 or [rzeszutko2@llnl.gov](mailto:rzeszutko2@llnl.gov).

## Newsline

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

#### Contacts:

Media & Communications manager: Lynda Seaver, 3-3103  
Newsline editor: Don Johnston, 3-4902

Contributing writers: Bob Hirschfeld, 2-2379; Linda Lucchetti, 2-5815; Charles Osolin, 2-8367; David Schwoegler, 2-6900; Anne M. Stark, 2-9799; Stephen Wampler, 3-3107. For an extended list of Lab beats and contacts, see <http://www.llnl.gov/pao/contact/>

Photographer: Jacqueline McBride

Designer: Julie Korhummel, 2-9709

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**Public Affairs Office:** L-797 (Trailer 6527), LLNL, P.O. Box 808, Livermore, CA 94551-0808

**Telephone:** (925) 422-4599; Fax: (925) 422-9291

**e-mail:** [newsline@llnl.gov](mailto:newsline@llnl.gov) or [newsonline@llnl.gov](mailto:newsonline@llnl.gov)

**Web site:** <http://www.llnl.gov/pao/>



### LAB TV broadcasts

For information about Lab TV broadcasting and video production, contact LLTN, 3-3846.



A special broadcast event: **SAFE’s Program film festival, Aug. 16 – 25**

TUES. **16** Secrets, Lies and Atomic Spies

TUES. **23** Spy Tech: The Real 007

WED. **17** Modern Marvels: Surveillance Tech

WED. **24** Spy Tech: The Deadly Game

THURS. **18** History Undercover: Cyberterrorism

THURS. **25** Doing the Right Thing, When It’s the Hardest Thing to Do

Above programs will appear on Lab TV Channel 2, at 10 a.m., noon, 2, 4 and 8 p.m. and 4 a.m.



JACQUELINE MCBRIDE/NEWSLINE

## Boxer assistant briefed on Laboratory programs

National Ignition Facility Associate Director Ed Moses (center) explains how the laser works to Ann Norris, legislative assistant to U.S. Sen. Barbara Boxer, as Bill Dunlop looks on. Norris visited the Laboratory Wednesday and received briefings and tours of NIF, Advanced Simulation and Computing and Homeland Security.

# NIF institutes 9/80 work schedule for summer

The summer is half over and the NIF Directorate is reporting great success with its "9/80 Summer" Alternate Work Schedule (AWS).

This pilot program, which started on Fourth of July weekend and runs through Labor Day weekend, offers a 9/80-work schedule to most NIF Directorate Programs personnel. About 550 of



the 800 who work on NIF programs joined. Most of the NIF Project has taken full advantage of this opportunity.

NIF Associate Director Ed Moses heard about this approach to alternate workweek schedules from a former NIF staff member who now works in private industry.

"It seemed like a great idea to give everyone a chance to enjoy the summer. It combines good weather with extra family time while school is out," he said.

After the program received the approval by Lab management, Directorate Administrator

Shelia Williams and her team turned the idea into a functioning program.

"People are working hard to continue to meet our NNSA milestone deadlines and still enjoy the benefits of 9/80s this summer," she said. "Participants could choose between two groups, arranged to minimize impact on NIF activities. Everyone seems to be very happy with how it is going."

The NIF Directorate is combining programs like the Summer 9/80 Program with its Healthy Heart Initiative for a healthy and productive work environment.

## BRIEFLY

### Cancer Awareness Campaign

The LLNL/Sandia Cancer Awareness Campaign will present "Colon Cancer Prevention and Treatment," by Pleasanton oncology surgeon, Dat Tien Nguyen on Aug. 24 from noon-1 p.m. in the Sandia CRF building. The talk will focus on information regarding causes of colon cancer and recent medical advances in colon cancer treatment. For more information, contact Mark Costella, 2-8999, or Cathy Kaplan, 3-6555.

### "Living Well" series begins

The Living Well Fall 2005 speaker series kicks off with "Career Fitness 101: Keeping Your Career in Shape" on Thursday, Aug. 25, from noon to 1 p.m. in the Bldg. 361 auditorium. In "Career Fitness 101" participants will learn about career self-reliance concepts, the players involved in the career development process, techniques for managing your career and career development tools.

The Living Well series will continue through November, featuring workshops on elder care, parenting and stress management. Upcoming workshops include:

- Difficult Discussions with Aging Parents — Sept. 8

- Eldercare: Introduction to Estate Planning — Sept. 22
- Effective Communication Skills at Work and Home — Oct. 6
- The Working Parent — Oct. 20
- Coping with the Holidays — Nov. 3

Workshops are held on Thursdays from noon to 1 p.m. in the Bldg. 361 auditorium. No food or beverage allowed in the auditorium. Watch for workshop details in future editions of *NewsLine* and *NewsOnLine*. For more information, call the Work-Life Center at 2-9543.

### Lab's UC Police Department on the move

On Monday, Aug. 29, the Lab's University of California Police Department moves to Trailer 3725, sometimes referred to as "the Xs." During the move, the department can be reached by phone at 3-3688 or 3-8967. To visit the new office, enter Parking Lot C6-N, then look for the UC Police sign on the 200 wing of Trailer 3725.

### Recruitment workshops to be held

The Lab's Recruitment Program Team (RPT) will present "University of Winning Recruitment," a series of workshops designed to provide timely and valuable information for new and seasoned recruiters. These work-

shops will cover a range of topics relating to recruiting.

- Workshop I: "Recruit to What You Know: Opportunities at LLNL." Tuesday, Aug. 23, 8:30 a.m. to 3 p.m., Trailer 1879. Lunch is provided.

Learn first hand from the directorates about their "hot projects" and workforce needs. This workshop will feature key individuals from different LLNL directorates highlighting their organization's staffing needs. Come join us and learn more about recruiting efforts at the Laboratory.

- Workshop II: "Discovering a New Generation of Recruiting." Thursday, Aug. 25, 8:30 a.m. to 3 p.m., Trailer 1879. Lunch is provided.

Keynote speaker is Carol Kinsey-Goman. In this interactive session, recruiters will develop and enhance their recruiting skills by educating themselves to a new generation of recruits — "The Millennials." The program will target how to recruit a new generation of talent, diversity recruiting best practices and an overview of "what's next" in industry trends. In addition, participants also will hear updates from RPT and gain valuable tools to add to their toolkit for success.

For information, contact April Dambrosio, 2-5218, or [dambrosio2@llnl.gov](mailto:dambrosio2@llnl.gov).



## NEWS YOU CAN USE



## Summer Student Calendar



### Week of August 15

**Tuesday**  
**16**

**ICST Seminar:** "Newton-Krylov Methods," by Carol Woodward, CASC. 2:30 p.m., Bldg. 219, room 163. Contact:

Tiffany Ashworth, 4-3491.

Seminars, panels and other activities are winding down for summer student employees. Go to the Student Bulletin Board at <http://education.llnl.gov/sbb/> for details and to register for events.

### Week of August 22

**Tuesday**  
**23**

**ICST Seminar:** "Scientific Discovery Through Advanced Computing," by David E. Keyes, acting director, Institute for Scientific Computing Research.

2:30 p.m. Bldg. 219, room 163. Contact: Tiffany Ashworth, 4-3491.

**Wednesday**  
**24**

**ICST Seminar:** "Conflict Simulation," by John Goforth and Akira Haddox, NAI Computing Applications. 2:30 p.m., Bldg. 219, room 163. Contact: Tiffany Ashworth, 4-3491.

### Week of August 29

**Tuesday**  
**30**

**ICST Seminar:** "Multigrid Methods," by Van Henson, CASC. 2:30 p.m. Bldg. 219, room 163. Contact: Tiffany Ashworth, 4-3491.

**Wednesday**  
**31**

**ICST Seminar:** "Supercomputing at LLNL," by Kim Cupps, Integrated Computing & Communications High Performance Systems. 2:30 p.m., Bldg. 219, room

163. Contact: Tiffany Ashworth, 4-3491

## Technical Meeting Calendar

**Friday**  
**12**

**CENTER FOR ACCELERATOR MASS SPECTROMETRY**  
"Club Drugs, MDMA Methamphetamine — Human Pharmacology," by

John Mendelson, Addiction Pharmacology Research Laboratory. 11 a.m. -noon, Trailer 2925, room 122. Property protection area. Foreign national temporary escorted building access procedures apply. Contact: Paul Daley, 3-1759.

**CHEMISTRY AND MATERIALS SCIENCE DIRECTORATE/MATERIALS SCIENCE AND TECHNOLOGY DIVISION**

"Computer Code 'MOLOCH' for Parallel MD," by Philipp Sapozhnikov, Russian Federation Nuclear Center, Institute of Technical Physics (VNIITF). Noon, Bldg. 235, room 1090, Gold Room. Property protection area. Foreign national temporary escorted building access procedures apply. Contact: Jim Tobin, 2-7247, or Sherry Mathews, 3-9890.

**Monday**  
**15**

**CHEMISTRY & MATERIALS SCIENCE**

"Chemical Engineering of Proteins. Playing Chemistry with Nature," by Bio-Organic Synthesis and

Protein Chemistry Group. 2 p.m., Bldg. 151, room 1209, Stevenson Room. Property protection area. Foreign national temporary escorted building access procedures apply. Contact: Ted Tarasow, 3-7241, or Kathy Ricard, 3-8024.

**Tuesday**  
**16**

**CENTER FOR APPLIED SCIENTIFIC COMPUTING (CASC) / INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH (ISCR)**

"An Edge-Based Algebraic Multigrid Method for Finite-Element Elasticity

Problems," by Johannes K. Kraus, Johann Radon Institute for Computational and Applied Mathematics (RICAM), Austrian Academy of Sciences. 10 a.m., Bldg. 451, room 1025, White Room. For more information, go to <http://www.llnl.gov/casc/calendar.shtml>. Property protection area. Foreign national temporary escorted building access procedures apply. Contact: Panayot Vassilevski (CASC), 3-5685 or Erica Dannenberg, 3-2167.

**INTEGRATED COMPUTING & COMMUNICATIONS DEPARTMENT**

"Back-up to Disk: How Capacity Optimization Makes Disk-Backup Fast, Affordable and Reliable," by Matt Jacobs & Brian Atwood, Data Domain. 10 a.m., Bldg. 453, room 1010. Property protection area. No temporary building access for foreign nationals. Contact: Mary Ann Chapeta, 4-4103.

**INTEGRATED COMPUTING & COMMUNICATIONS DEPARTMENT**

"HP & Holman's Present their Latest Offerings Available", by Mike Moran and John Santoru. 2- 4:30 p.m., Bldg. 471, Central Cafeteria. Refreshments will be provided. Common use facility. Foreign nationals may attend. Contact: Mary Ann Chapeta, 4-4103, or Bob Beane, 2-2327.

**Wednesday**  
**17**

**PHYSICS AND ADVANCED TECHNOLOGIES DIRECTORATE-WIDE SEMINAR**

"Low-Energy Nuclear Recoils for Fun and Profit," by Juan I. Collar, University of Chicago. 2 p.m., Bldg. 123, auditorium. Common use facility. Foreign nationals may attend. Contact: Michael J. Pivovarov, 2-7779, or Alan J. Wootton, 2-6533.

**NATIONAL IGNITION FACILITY PROGRAMS**

"X-Ray Imaging and Compton Polarimetry of Atomic Transitions in Heavy, Highly Charged Ions," by Thomas Stoehlker, University of Frankfurt and GSI-Darmstadt. 11 a.m., Bldg. 482, room 1053. Property protection area. Foreign national temporary escorted building access procedures apply. Contact: Dieter Schneider, 3-5940, or Monica Antone, 3-8200.

**INTEGRATED COMPUTING & COMMUNICATIONS DEPARTMENT**

"Newest Dell Server Models and Technology," by Dell and TIG sales and technical staff. 2- 4:30 p.m., Bldg. 471, Central Cafeteria. Common use facility. Foreign nationals may attend. Contact: Mary Ann Chapeta, 4-4103, or Bob Beane, 2-2327.

**Thursday**  
**18**

**CENTER FOR APPLICATIONS DEVELOPMENT & SOFTWARE ENGINEERING (CADSE)/INSTITUTE FOR**

**SCIENTIFIC COMPUTING RESEARCH**  
"Zen and the Art of Python Programming," by Patrick Miller, LLNL, Center for Applied Scientific Computing. 2 p.m., Bldg. 453, room 1001, Armadillo Room. Property protection area. Foreign national temporary escorted building access procedures apply. Contact: Patrick Miller (CASC), 3-0309, or Erica Dannenberg, 3-2167.

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

Please submit your meetings via the new Technical Meeting Calendar form on the Web, located at <http://www.llnl.gov/tmc/index.html>

## Lights-camera-science



Wolf explains an “uplifting” experience — how the use of a pulley can multiply a person’s strength.



PHOTOS BY JACQUELINE MCBRIDE/NEWSLINE

Wolf amazes the audience when he uses the product “Zel Gel” to protect his hand before setting it on fire.

Steve Wolf says he has the best job in the world. He lights houses on fire, crashes cars, and throws people from buildings. This week, the Lab hosted “Science in the Movies,” a lively, one-hour presentation by Wolf, a special effects and stunt coordinator. Wolf demonstrated the basic science and safety principles behind the stunts and special effects we often marvel at in movies and on television. Wolf, whose many film credits include “Castaway,” “The Firm,” “A Time to Kill” and “The Jungle Book,” showed how mechanics, kinetics, heat, electronics and chemistry are “behind the scenes” of many spectacular stunts. Two performances were held at Pleasanton’s Amador Theater as part of the Lab’s World Year of Physics activities.

## Arroyo construction to reduce erosion while maintaining habitat

Construction is scheduled to begin next week and continue through October to repair and restore the Arroyo Seco Channel located at the southwest corner of Laboratory property, near the intersection of Vasco Road and East Avenue.

The objectives of the Arroyo Seco project are to stabilize and reduce excessive erosion, ensure safe conveyance of water through the site so that LLNL buildings and structures are protected from flood flows, and to reduce the amount of sediment into the arroyo that is on

Laboratory property while minimizing negative habitat impacts. The repairs will include bio-technical erosion control, realignment of the channel, and re-vegetation of the site with native grasses, trees and shrubs.

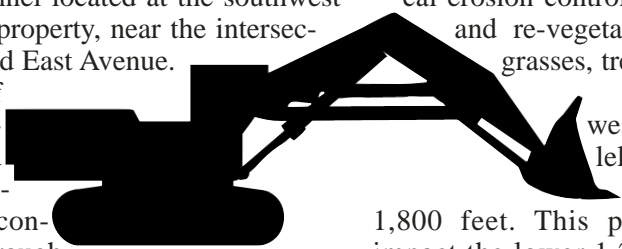
The creek flows in a northwestern direction, roughly parallel to East Avenue and reaches into Lab property by about 1,800 feet. This project, however, will only impact the lower 1,250 feet of Lab property.

The engineering design for the channel improvements was based on detailed geomorphic, hydrologic, and biological monitoring.

Biological surveys and monitoring will be included in the project to ensure that impacts to wildlife are minimized and will continue for five years after this summer’s construction activities. The biological and water quality review of the project has included working with the U.S. Fish and Wildlife Department, the Army Corps of Engineers and the San Francisco Bay Regional Water Quality Control Board.

The long-term goal of the project is to manage erosion while improving wildlife habitat and water quality in Arroyo Seco.

For more information, contact Project Manager Gary Freeland at 2-9411.



## Protesters gather on 60th anniversary of bombings



Demonstrators marched to the Laboratory’s perimeter on Saturday and again during Tuesday morning to protest the 60th anniversary of the Hiroshima and Nagasaki bombings.

During the Saturday demonstration, participants began gathering at William Payne Park at Vasco and Patterson Pass Roads starting about 4 p.m. Shortly after 7 p.m., the contingent marched to West Gate Drive, arriving about 7:15 p.m.

Following a program of music, chants and burning slips of paper on the ground, the group dispersed about 8:40 p.m. The crowd was estimated at about 200 people. There were no acts of civil disobedience and no arrests.

The Tuesday morning Nagasaki demonstration produced 98 adult demonstrators and four juveniles. Participants began gathering at the park starting about 7 a.m. Shortly after 9 a.m., the group marched to West Gate Drive, arriving about 9:15 a.m., when they proceeded to block the Laboratory entrance.

Following a request by sheriff’s deputies to disburse, 54 members of the crowd refused and were arrested for blocking a public roadway. If no warrants were outstanding, individuals were cited and released after presenting identification. The West Gate entrance was re-opened about 10:10 a.m.



DAVID SCHWOEGLER/NEWSLINE



**CAMS***Continued from page 1*

and paleontology to date the age of artifacts. However, in this application which appeared in the July 15 issue of the magazine *Cell*, the scientists used the pulse of radiocarbon to pinpoint individual cells' birth dates to within two years.

Radiocarbon or carbon-14 is naturally produced by cosmic ray interactions with air and is present at low levels in the atmosphere and food. Its concentration remained relatively constant during the past 4,000 years, but atmospheric testing of nuclear weapons from 1950 to 1963 produced a global pulse in the amount of radiocarbon in the atmosphere, Buchholz said.

Traditional carbon dating uses the ratio of radiocarbon to normal carbon in an organism to date its age. Previous research showed that while an animal or plant lives, eats and breathes, the ratio of normal carbon to radioactive will be equal to

that found in the atmosphere. When it dies, the radiocarbon concentration decreases as it decays since new carbon is not replacing it.

Cells in the body, such as red blood cells, are often regenerating. But DNA is a material that doesn't exchange carbon after cell division, so it serves as a time capsule for carbon and in turn can serve as a way to pinpoint the birth dates of individual cells.

"But it wasn't clear whether we create neurons after birth," Buchholz said.

Using CAMS, Buchholz dated DNA from different kinds of cells in the body. The conclusion when it comes to certain brain cells was "When it comes to neurons, what you're born with is what you've got for life," he said.

Using research cadavers, the scientists dated neurons in people born prior to 1950 and those born after 1963 (the year that above-ground nuclear testing ended). What they found was that the neurons in those born prior to 1950 showed no spike in radioactive carbon from the atmospheric

testing.

"There was no bomb carbon in their neurons," Buchholz said. "But those born after 1963 had levels that were consistent with what was in the atmosphere at the time of their birth. The conclusion was that there is no neurogenesis occurring in the cortex after birth."

The research is supported by the NIH National Resource for Biomedical Accelerator Mass Spectrometry at CAMS and by the Human Frontier Science Program (HFSP). HFSP supports multinational, multi-discipline collaborations and is funded by Japan, the European Union, Germany, France, Italy, the United Kingdom, Switzerland, Canada, the National Institutes of Health and the National Science Foundation.

Buchholz said further research will delve into other brain regions to determine the origin of neurodegenerative diseases.

"This is another opportunity to help solve a problem they (Karolinska researchers) couldn't get at other than using AMS," Buchholz said.

**MONITORING***Continued from page 1*

Because of the threat of chemical warfare and its use, the Chemical Weapons Convention was signed in 1993 to ban the stockpiling, production and use of chemical weapons. This treaty, now signed by 170 nations, includes intrusive verification procedures that far exceed those of other treaties banning weapons of mass destruction.

However, in recent years, the world's chemical industry has been developing micro-reactors that range in size from a credit card to the dimensions of a notebook to replace large batch reaction vessels. For the chemical industry, this change permits safer processing, better chemical yields and a reduction in overall costs.

"The key issue with these advancements in science and technology is that it's going to make it more difficult to monitor and verify compliance of the Chemical Weapons Convention," Nguyen said. In his paper, he noted: "The inherently small physical size of the equipment and small space required make it attractive for clandestine operations. The ability to produce chemicals of interest in a safer

and more feasible manner, with little signature produced, could encourage their application for malicious intent."

Although the full chemical synthesis potential of micro-reactors is not yet clear, several lethal chemicals — hydrogen cyanide, phosgene and methyl isocyanate — have already been produced using this system, according to Nguyen. In China, nitroglycerine has recently been produced using microprocess technology at a maximum rate of 10 kilograms per hour.

Another danger created by the growing usage of micro-reactors is that chemical weapon precursors could be synthesized rather than purchased, making it more difficult to discover the preparation of chemical weapons.

In Nguyen's view, while the need for control and verification must not hinder the development of these chemical industry technologies, the security challenges should not be ignored.

"To address these issues, the Organization for the Prohibition of Chemical Weapons should begin by partnering, not only with industry experts, but also with innovators of this technology to identify and characterize immediate threats associated with these advancements," Nguyen said.

Another step that could be taken, Nguyen notes, would be to fully implement United Nations Security Council Resolution 1540, which calls on nations to adopt legislation to criminalize proliferation activities and to develop and implement appropriate, effective export controls.

Nguyen, who is starting the third year of his three-year fellowship at CGSR, also does organic chemistry research in the Chemistry and Materials Science Directorate and at the Lab's Forensic Science Center.

"The fellowship consists of doing scientific work as well as policy studies. Continuing my scientific research was one of the features that attracted me to this fellowship," he said.

Before coming to LLNL, Nguyen earned his bachelor's degree in biochemistry from the University of Texas at Austin and received his Ph.D. in synthetic organic chemistry from Iowa State University, where he also worked at the Department of Energy's Ames Laboratory.

"My experience at the Center for Global Security Research has been invaluable. I have particularly enjoyed and learned from the center's senior fellows with whom I've worked," he said.

**Study group supercomputer stopover**

BOB HIRSCHFELD/NEWSLINE

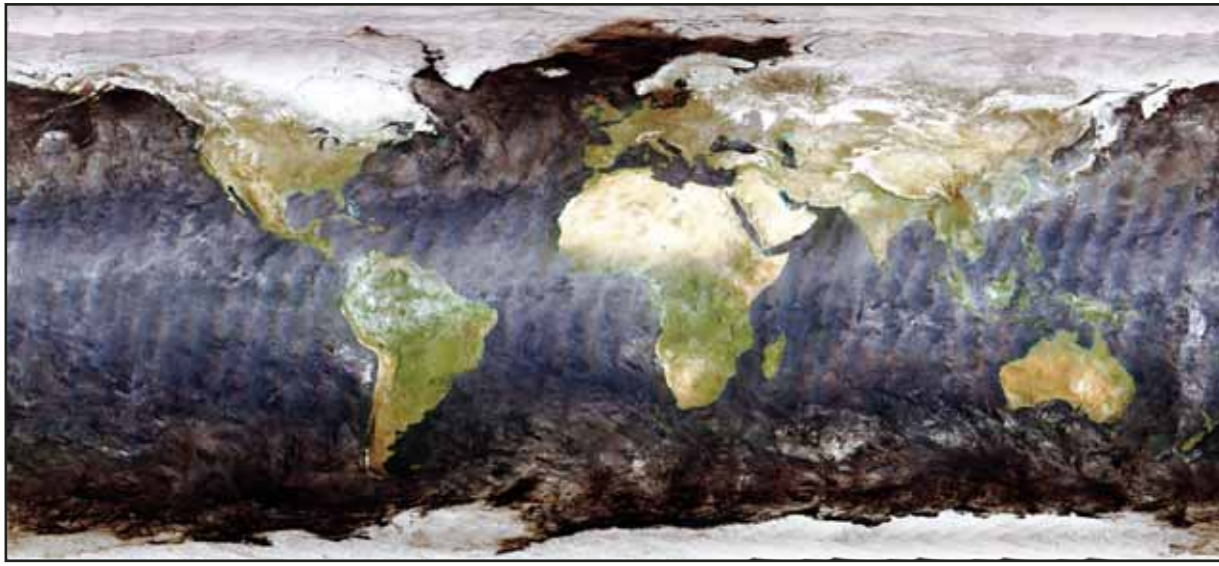
Members of the Defense Science Study Group Institute for Defense Analysis visited the Laboratory this week to receive tours and program overviews and work with Laboratory mentors. The members, in front of the BlueGene/L supercomputer, are: Front row (left to right) Karen Olson, Daphne Pruess, Catherine Murphy, Julie Theirot, Dawn Tilbury, Lynne Parker, Anthony Joseph and Phillip Gould. Back row: Diane Wright, Valerie Ashby, Raymond Deshires, Kenneth Gall, Darrell Scholm, Robert Schoelkopf and Jonathan Eisen.

**CLIMATE***Continued from page 1*

their simulations with temperatures from a single satellite dataset, which showed slight cooling of the tropical troposphere since 1979. This region of the atmosphere is predicted to warm in climate model simulations that include observed increases in greenhouse gases. The discrepancy in tropical temperature trends has been used to cast doubt on the reliability of computer models, and on their usefulness for predicting future climate changes.

Three papers published in Thursday's edition of *Science Express* shed light on this debate. The first two studies revisit temperature data obtained from satellites and weather balloons, and provide compelling evidence that the tropical troposphere has warmed since 1979. The third study, led by scientists at the Laboratory, finds that these new observational estimates of temperature change are consistent with results from state-of-the-art climate models.

The computer models analyzed in the Livermore study show that in the deep tropics, temperature changes in the troposphere are larger than



COURTESY OF EUROPEAN SPACE AGENCY

**This March 2003 mosaic image of Earth is made up of true color images from the Envisat Earth Observation satellite in polar orbit at an altitude of 800 kilometers. Taken by the Envisat's Medium Resolution Imaging Spectrometer, the image consists of data combined from about 500 separate orbital segments.**

at the surface. This "amplification" effect is caused by the release of heat when moist tropical air rises and condenses into clouds. The size of the amplification effect is very similar in nearly 50 simulations performed with 19 different models.

The new satellite and weather balloon data described in the first two *Science Express* papers have amplification behavior that is in agreement with the model results and with basic physical theory.

"This strongly suggests that there is no longer any fundamental discrepancy between modeled and observed temperature trends in the tropical atmosphere," said Benjamin Santer, lead author

Livermore researchers Stephen Klein, Karl Taylor, Peter Gleckler, Jim Boyle and Charles Doutriaux. Other team members were from the National Center for Atmospheric Research, Remote Sensing Systems of Santa Rosa, Calif., the National Oceanic and Atmospheric Administration's Air Resource Laboratory, the Hadley Centre for Climate Prediction and Research, Lawrence Berkeley National Laboratory, NOAA's Geophysical Fluid Dynamics Laboratory, the University of Washington, NASA Goddard Institute for Space Studies and NOAA's National Climatic Data Center.

of the Livermore-led *Science Express* paper and a scientist in the Laboratory's Program for Climate Model Diagnosis and Inter-comparison. "The new observational data helps to remove a major stumbling block in our understanding of the nature and causes of climate change. Our work illustrates that progress toward an improved understanding of the climate system requires a combination of observations, theory and models."

Santer led an international team of scientists, including

**FELTON***Continued from page 1*

the last 10 years," Felton said, noting that the panel has made recommendations on such issues as MTBE, the controversial gasoline additive banned by the state in 1999, and on breast cancer prevention agents.

"Picture a huge hearing room with seven scientists sitting facing sometimes hundreds of lawyers, consultants and lobbyists in three-piece suits, waiting for a decision either in favor or against the wishes of the corporations or agencies they represent," Felton said. "It's a different experience from

giving a lecture or seminar to scientific peers."

Originally created as a result of California's Proposition 65, the voter initiative that bans substances that cause cancer or reproductive toxicity from drinking water and requires warning labels where the substances occur, the committee has survived legal challenges and political controversies over the years. Currently, Felton said, it is studying whether warning labels should be required on such common baked goods as bread, french fries and potato chips, which contain acrylamide — a substance that causes cancer in animals at very high doses.

"There are many questions that need to be answered," Felton said. "Do we need a label, if so where to put it, and what should it say?"

Acrylamide results from heating starch at high temperatures, he said, so "it's not a contaminant — but it's found in such things as whole wheat bread. Are we going to tell people not to eat whole wheat bread?"

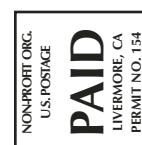
"There are hundreds of compounds that may need to be labeled (under Prop 65)," Felton said. "My job is to see that there's good scientific evidence behind the listing. That's why I'm still on the committee."

Felton joined the Laboratory's Biomedical Sciences Division in 1976, and has published extensively on the role of diet in carcinogenesis and mutagenesis. He has been involved in the Laboratory's research on food mutagens since it began more than 25 years ago.

**Poster perfect**

JACQUELINE MCBRIDE/NEWSLINE

Summer student Lucas Zoet (right) on Wednesday afternoon explains to Jacob Bear, professor emeritus and former dean of engineering at the Technion in Haifa, Israel, his display on ground water contamination at Site 300. Zoet's poster was one of more than 150 on display at the 2005 Student Research Symposium.



**Newsline  
UC-LLNL  
PO Box 808, L-797  
Livermore, CA 94551-0808**