

NEWSLINE

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Friday, September 16, 2005

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Remembering September 11



DON JOHNSTON/NEWSLINE

In what has become an annual tradition, the flag displayed over the northwest entrance to the Superblock was changed in a solemn ceremony Monday morning to remember those who lost their lives in New York City, the Pentagon in Washington D.C. and Pennsylvania on September 11, 2001. Flags that had previously flown at the Superblock were presented to the Laboratory's Fire Department and the Protective Force Division.

Lab team dispatched to Gulf with detection technologies to assist with disaster recovery

By Steve Wampler

NEWSLINE STAFF WRITER

A team of four Lab employees has been dispatched to the Gulf Coast with detection, communication and night vision technologies to provide possible assistance in search and recovery operations.

They join the recovery mission in the Louisiana region where two Lab firefighters, Capt. Arnie Brockmire and firefighter Ken Rinna, have been helping with swift water rescue operations for about two weeks. The firefighters are scheduled to return to the Bay Area today.

Additionally, two Lab centers — the National Atmospheric Release Advisory Center and the Biodefense Knowledge Center — have been tapped to provide modeling predictions and track requests for assistance, respectively.

The four employees — electronics engineers Richard Leach and Carlos Romero, and mechanical engineering associate Mark Vigars, all of the Engineering Directorate, and safety officer Willie Thompson of Hazards Control — flew to Florida Tuesday night and arrived in the New Orleans area Wednesday.

See RECOVERY, page 8

Livermore to assist Libyan lab in 'redirection' of weapons work

By Don Johnston

NEWSLINE STAFF WRITER

Under a recently signed agreement, the Laboratory will work with the Tajura Nuclear Research Center in Libya to help redirect the North African country's nuclear weapons research effort to peaceful applications under the Department of Energy's Sister

Laboratory Program.

"This represents a special challenge for the sister lab program because Libya remains on the U.S. list of states sponsoring terrorism," said Mo Bissani of NAI, manager for the MPC&A and LLNL Sister Lab Program, who has made two trips to Libya to lay the groundwork for collaboration in areas ranging from radiation protection and health physics to environmen-

tal monitoring and water resource management.

Livermore also has a "Sister Laboratory Arrangement" with nuclear research centers in Morocco and Egypt. The mission of the DOE/National Nuclear Security Administration program is to collaborate on peaceful nuclear applications with developing

See LIBYA, page 8

Lab's annual HOME Campaign prepares for an early kickoff

By Linda Lucchetti

NEWSLINE STAFF WRITER

The annual HOME (Helping Others More Effectively) Campaign is preparing for its 31st event, with the traditional "Run for Home" slated for Wednesday, Oct. 12. This year, the Defense and Nuclear Technologies (DNT) Directorate is leading the



See HOME, page 7

Scientists reveal the way nanotubes grow

By Anne M. Stark

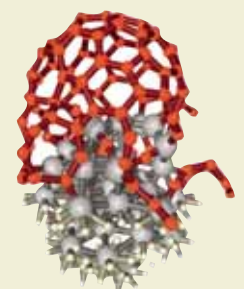
NEWSLINE STAFF WRITER

Livermore scientists have revealed the way nanotubes — molecules that are typically 10,000 times smaller than the diameter of a human hair — may grow. It all depends on the size and type of the material where they are growing.

A carbon nanotube is a cylindrical carbon structure consisting of atoms arranged in a way similar to that of graphite. Because nanotubes are extremely strong and have good thermal conductivity, there is considerable interest to use them in nanoscale electronic and mechanical applications.

The study of how these

See NANOTUBES, page 7



A quantum simulation of the early stage of growth of a carbon nanotube on an iron nanoparticle.



Interns bolster homeland security
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NIF collaboration with UCLA
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Forensic method with teeth
— Page 5



LAB COMMUNITY NEWS

Weekly Calendar

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Tuesday
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Microcentury Toastmasters presents the Fall 2005 **Humorous Speech and Evaluation Contest** from 12:05–1 p.m. in Bldg. 151, room 1209, Stevenson Room. Employees are invited to attend and listen to short (five- to seven-minute), humorous talks and also, evaluations, which are Toastmasters' unique way of helping fellow members to improve their speaking and presentation skills. For more information, contact Jeff Morris, 2-0176.

Wednesday
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Join the Amigos Unidos Hispanic Networking Group for the annual **Hispanic Heritage Month Celebration** 11:30 a.m. to 1 p.m., outside of Bldg. 551 at the picnic area near the basin. The band Timbalero will entertain with salsa music. A choice of carnitas, chile colorado or tamal lunch plates, which include rice, beans, tortillas and a drink, will be available for \$6.50. Proceeds go to Amigos Unidos community scholarships. Lunch plates may be pre-purchased by Sept. 16 or at the event. To pre-purchase lunch tickets, call Rey Bocanegra, 3-5309; Juan Hernandez, 2-0347; Mary Judkins, 4-4639; Andres Martinez, 3-9752; or Jessica Noriega, 2-6750. For more information, contact the Work-Life Center, 2-9543.

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The **Leadership Broadcast series** continues with Stephen Covey's "The 8th Habit," from 9-10:30 a.m. with a special viewing in the Bldg. 155 auditorium. In this presentation, Covey will show how to tap into your talents and fuel your passion, how to find your voice and help others find theirs, and how to achieve fulfillment, significance and contribution. The series will be broadcast live on Lab TV Channel 4. Register for these broadcasts at: http://www-r.llnl.gov/human_resources/sedd/eodd/lds_lbs.html

Thursday
22

Laboratory Archives will present a historical Lab-produced **film on the completion in 1986 of the Mirror Fusion Test Facility (MFTF)** on Thursday, Sept. 22, at noon in the Bldg. 543 auditorium (new location.) In addition, the film will be shown again on Friday, Sept. 23 at noon in the Bldg. 543 auditorium. Employees are invited to attend.

BRIEFLY

Annual salary review process briefings

The annual salary review began Friday, Sept. 9 and is scheduled to run through November. Compensation will hold three employee-briefing sessions in the Bldg. 361 (Biosciences) auditorium, room 1140, on the following dates:

- Monday, Sept. 19, noon-1:30 p.m.
- Tuesday, Sept. 20, 7:30-9 a.m.
- Wednesday, Sept. 21, 4 -5:30 p.m.

Information on the FY06 salary program is available on the Compensation Website, http://cmg-r-rr.llnl.gov/ahrd/cbwp/compensation/annual_salary_program.php. You must have Livelink to access files from this Website.

Flu vaccine update

Health Services is requesting 3,500 doses of flu vaccine for the 2005-2006 flu season, although delivery is not assured due to uncertainties in the supply chain. They are hoping that the vaccine will arrive by the end of September. Once the vaccine is onsite, flu clinic dates and locations will be communicated. Walk-in clinics in the cafeterias and at HSD will be free of charge to workers. If your department would like to request a field clinic in your area, please contact your ES&H team clinician to make arrangements for the additional staffing that will be required.

Living Well Speaker Series

The Living Well Speaker Series continues with "Eldercare: Introduction to Estate Planning" on Thursday, Sept. 22, noon to 1

p.m. in the Bldg. 361 auditorium.

This one-hour workshop will be presented by Matthew C. O'Donnell, an estate planning attorney with more than 24 years of experience. The workshop provides insight into estate planning for incapacity, probate avoidance and estate tax reduction. Living Well presentations are free and open to all employees.

The series is sponsored by the Work-Life Center, Health Services Department/ Employee Assistance Program and EAP/CONCERN (external employee assistance program). For more information, call the Work-Life Center, 2-9543.

Balancing work and family

Parenting classes on "tween" and teen and infant through age 10 are starting up.

"Balancing Work and Family: Tween" and Teen Parenting Class" is a new class that meets on the 1st and 3rd Tuesdays, noon-1 p.m. in Bldg. 571, room 2000. The class runs Sept. 20-June 27, 2006.

The "Balancing Work and Family: Infant through Age 10 Parenting Class" meets on the 2nd and 4th Tuesdays, noon-1 p.m. in Bldg. 571, room 2000 and continues Sept. 27-June 13, 2006. Class discussions are facilitated by Ruth Gasten, local parenting educator with more than 30 years of experience.

Classes are free and are open to all Laboratory employees. Registration is recommended. To register for either class, contact Carol Sandoli at sandoli1@llnl.gov or come to a class session. The program is sponsored by the Work-Life Center. For more information, call the Work-Life Center at 2-9543.

IN MEMORIAM

John D. Braaten

John D. Braaten died on Aug. 22. He was 74. Braaten was born in Edmore, N.D. on Feb. 6, 1931. He lived in Livermore for the past 34 years. He worked as a supply analyst at the Laboratory before retiring in 1990.

He enjoyed watching the television show "Jeopardy," traveling, taking walks and spending time with his Air Force buddies.

He is survived by his sons, Keith Braaten and Kim Braaten of Livermore, sisters Verna Smith of Aurora, Colo., Darlene Diesth of North Dakota, Beverly Silva and Hazel Vallier, both of Union

City, five grandchildren, and seven great-grandchildren.

Services were held in Livermore. Donations can be made to the American Cancer Society, 7000 Village Parkway, Suite L, Dublin, Calif. 94568.

Newsline

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LAB TV broadcasts

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



MONDAY– FRIDAY, SEPT. 19-23

In honor of Hispanic Heritage Month, AADP's Diversity Speaker Series presents:

MONDAY, TUESDAY, WEDNESDAY: A presentation by NASA astronaut Ellen Ochoa, 1:20 p.m.

THURSDAY, FRIDAY: "Diversity: Deriving Advantage from Difference," by Santiago Rodriguez. 1 p.m.

These programs will appear on Lab TV Channel 2, 4 and 7 at 10 a.m., noon, 2, 4 and 8 p.m. and 4 a.m.

Interns strengthen Lab homeland security research effort

By Linda Lucchetti

NEWSLINE STAFF WRITER

Interns working at the Lab under the Department of Homeland Security (DHS) Scholars and Fellows Program received an added bonus to their summer assignments when they got a chance to talk with DHS Secretary Michael Chertoff during his first visit to the Lab in July.

The DHS interns are some of the nation's best and brightest undergraduate and graduate students. As part of their DHS scholarship/fellowship, they spend approximately 10 weeks in the summer working alongside researchers at LLNL and other national laboratories on a variety of projects in support of homeland security.

Barry Goldman, who managed the Lab's Critical Skills Internship Programs, is a strong advocate of the DHS internship program and is pleased with its progress.

"Last year, during the first cycle of recipients, LLNL hosted 15 DHS interns. This summer, that number has grown to 25 students — that means 25 of the total 100 participating nationwide chose to come to LLNL," Goldman reports.

Goldman wants to spread the word to Lab employees who know college students who may qualify.

"This is a wonderful opportunity. DHS funds tuition and fees, and provides a monthly stipend, plus the required 10-week internship," he said.

The DHS intern selection is based on identifying students interested in pursuing the basic science and technology innovations that can be applied to the DHS mission, taking into account the applicants' academic achievements, prior experience and technical interest. Roughly 50 undergraduates and 50 graduates are selected from across the country.

Goldman explains that in addition to the physical sciences, the students selected may also be studying life sciences, social sciences or psychology.

Such is the case with Catherine James Everett who completed her undergraduate work at Harvard University and is pursuing a Ph.D. at Columbia University in social and organizational psychology.

This summer, as a DHS fellow, she worked



JACQUELINE MCBRIDE/NEWSLINE

FDHS scholar Erin Steenblock, left, and DHS Fellow Catherine James Everett spent the summer doing research at LLNL.

in the Lab's Counterproliferation Analysis and Planning System (CAPS) group where she analyzed terrorist motivation and intent, focusing on how and why individuals become terrorists, and studied terrorist recruitment and group dynamics. Her internship objectives were exploratory in nature and included conducting a survey of terrorist literature to identify gaps in the literature and work toward developing a meta-analysis and an LLNL Terrorism Knowledge Base of social and psychological research done on terrorism to date.

In addition, Everett interviewed terrorist experts about their research methodologies and projects, traveling from Los Angeles to Boston, Philadelphia and Washington, D.C. to meet with professionals in the field.

Everett's mentor, Tony Farmer, said that she brought a fresh look to supporting the Global War on Terrorism working with an academic collaborative network.

Unlike her fellow interns who presented posters as their final exercise during the annual Student Research Symposium held this month, Everett assembled an out-briefing of her findings.

Everett chose the Lab because the internship was a "good fit" for her. "There are amazingly

diverse and intelligent people here committed to their work and to figuring out innovative solutions to problems. I have enjoyed working with people who have the same motivation I do," she said.

Erin Steenblock also completed a DHS internship this summer. She graduated from the University of Iowa and will attend Yale University in the fall, where she'll major in biomedical engineering. Steenblock heard about the internship program while attending the University of Iowa and last summer worked at Los Alamos National Laboratory.

Her project in the Chemistry and Materials Science directorate focused on genetic cloning and protein expression of

small circular miniproteins as scaffolds for the construction of high-affinity ligands able to neutralize biological toxins. Steenblock's mentor, Julio Camarero, a staff scientist in the Chemical Biology and Nuclear Science Division and new to the internship program, was very pleased with her work and the program in general.

"I had my doubts as to how much any student could accomplish in the short time frame," Camarero admitted. "But, she achieved much on her own and helped me a lot. I look forward to mentoring more students in the future."

Steenblock's view of her Lab experience was positive. "There's a lot going on here," she said. "One of the best parts was the lineup of activities planned for the summer students — tours, DHS briefings and networking opportunities. It's been great. I would definitely consider applying for a job here in the future."

Note: Students interested in applying for the DHS program should go to the Web at <http://www.ornl.gov/dhsed/>. Based on past years' schedules, registration will open sometime in October or November, with applications accepted in January or February.

New rules for occupational illness pay

Labor officials will host a series of town hall meetings to explain the interim final rule and other issues related to the implementation of Part E under the Energy

Employees Occupational Illness Compensation Program Act (EEOICPA).

Recent EEOICPA amendments abolished Part D and created Part E to provide compensation for certain Department of Energy (DOE) contractor or subcontractor employees who became ill as a result of exposure to toxic substances at specified DOE facilities. The new law also provides additional compensation for uranium workers covered by the Radiation Exposure Compensation Act (RECA) and certain survivors of covered employees.

Congress mandated that the U.S. Department of Labor (DOL) issue regulations governing implementation of

Town hall meetings planned

Meetings will be held Sept. 20 at 7 p.m. and Sept. 21 at 1 p.m. at the Doubletree Club Hotel, 720 Las Flores Road, Livermore.

Part E. To speed the start-up of the new program prior to issuing those regulations, DOL identified survivors payable under preliminary procedures issued in December 2004.

To date, more than \$127 million has been paid to 1,002 recipients under the new program. With the May 26 release of interim final rule, DOL is now able to undertake benefit analysis for complex claims, including wage loss and impairment evaluations.

Workers or survivors of workers who need assistance filling out claim forms may schedule appointments following the town hall meeting or may call toll-free, (866) 606-6302.

If you would like to schedule an interview with a Labor Department representative prior to the event, contact either Dolline Hatchett or Deanne Amaden at the phone number above.

Detecting and preventing waste, fraud and/or abuse throughout DOE complex

The Office of Inspector General (OIG) for the Department of Energy is responsible for detecting and preventing fraud, waste and/or abuse in DOE programs. The OIG accomplishes this through audits, inspections and criminal investigations of DOE and its contractors.

A wide variety of issues are investigated by the OIG, including management abuse, waste, grant fraud, contract fraud, false claims, false statements, defective pricing, defective parts, product substitution, bribery, solicitation of bribes, kickbacks, environmental violations, conflicts of interest, theft of government property, health and safety matters, and computer access or intrusion violations.

If you suspect fraud, waste and/or abuse, contact the OIG HOTLINE at (800) 541-1625 or (202) 586-4073. You are not required to identify yourself to hotline operators, and anonymous complaints are addressed just as vigorously as other complaints. If you contact the OIG and choose to provide your name, the OIG will protect your identity to the maximum extent possible by law.

OIG representatives can also be contacted at DOE offices in Albuquerque, NM, at (505) 845-4009; Las Vegas, (702) 295-0877; Livermore, 423-5060; and Denver, (720) 962-7551. For reporting computer crimes directly to the OIG Technology Crimes Section, call 423-5060.

To visit the OIG Website, go to <http://www.ig.doe.gov/>



NEWS YOU CAN USE

NIF's Niemann to lead UCLA collaboration

By Bob Hirschfeld

NEWSLINE STAFF WRITER

An academic collaboration between LLNL and UCLA will soon result in a payload of benefits to the Lab, as well as a treasure trove of frequent flier miles for Christoph Niemann.

The University of California and LLNL have selected Niemann, a research scientist at the National Ignition Facility (NIF), to become the NIF assistant professor at UCLA.

The professorship program was designed to link the elite academic community at UCLA, with LLNL's premier research facilities. It is patterned after longstanding partnerships between several UC campuses and Lawrence Berkeley National Lab's Advanced Light Source, as well as a program linking Los Alamos National Lab with UC-San Diego.

UCLA has a well-respected Plasma and Environmental Physics laboratory, and is home to the DOE-funded Electric Tokamak, a magnetic fusion system that has been operating for six years.

The NIF Programs Directorate will underwrite half of UCLA's expenses for Niemann and selected graduate students for five years.

Niemann, 32, has a history of being in the right place at the right time. While working on his Ph.D. in his native Germany, Niemann was recruited to come to LLNL by Siegfried Glenzer, a NIF researcher and fellow German, who was attending a conference and happened to know Niemann's faculty adviser.



JACQUELINE MCBRIDE/NEWSLINE

Research scientist Christoph Niemann was recently selected to become the NIF assistant professor at UCLA.

Niemann arrived at LLNL in 2002 as a post-doc, and was hired last year, during the UCLA professorship search. Even though numerous applications were received, Niemann was selected because he fit the desired criteria, especially his broad background in plasma

physics research.

"The opportunity more or less fell into my lap," he said. "Ever since I went away to college to study physics, I always hoped I could end up teaching. But over the years, I had dropped the idea because I became so busy with my research."

Niemann's teaching job officially begins in November, with first classes in January.

As an assistant professor, he will teach several freshmen courses in the Physics and Electrical Engineering departments, along with more advanced classes. He will also design a research lab at UCLA and commute to Livermore several days a week so he can continue his work on NIF with his students.

"I'm really excited," said Niemann. "I'm really looking forward to teaching, and to heading my own research group, and setting up a lab for small experiments we can do at UCLA before full-scale work on NIF."

Niemann is an expert on how NIF's laser beams interact with the plasma inside the hohlraum, the small gold capsule that contains the BB-sized fusion target.

"Christoph is an excellent choice for the NIF professorship. We look forward to working with him in his new role," said Bruce Warner, principal deputy assistant director for NIF Programs.

Technical Meeting Calendar

Friday
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INSTITUTE FOR GEOPHYSICS AND PLANETARY PHYSICS

"Dynamics of Giant Planet Atmospheres," by Andy

Ingersoll, California Institute of Technology. Noon, Bldg. 219, room 163. Property protection area. Foreign national temporary escorted building access procedures apply. Contact: Wil vanBreugel, 2-7195, or Lisa Lopez, 3-0250.

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

"Towards a Next Generation Climate Model," by Nikolaos Nikiforakis, University of Cambridge, UK. 10 a.m., Bldg. 451, room 1025, White Room. For more information, go to the web at: <http://www.llnl.gov/casc/calendar.shtml>. Property protection area. Foreign national temporary escorted building access procedures apply. Contact: Bill Henshaw (CASC), 3-2697, or Erica Dannenberg, 3-2167.

Tuesday
20

PHYSICS & ADVANCED TECHNOLOGIES DIRECTORATE WIDE SEMINAR

"Pulse Line Ion Accelerator," by

Richard Briggs, Science Applications International Corp. (SAIC). 2 p.m., Bldg. 2128, room 1000. Sponsored by Fusion Energy Program. Common use facility. Foreign nationals may attend. Contact: Alan J. Wootton, 2-6533, or John Barnard, 3-0675.

Wednesday
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INTEGRATED COMPUTING & COMMUNICATIONS DEPARTMENT

Macintosh Technical Seminar Series. Presentation by Jamie Richardson, Apple Federal Systems

Engineer. 10:30 a.m., Bldg. 543 auditorium. Contact: Duane Straub, 2-9774, or straub1@llnl.gov

PHYSICS AND ADVANCED TECHNOLOGIES/ N DIVISION

"Compton Imaging for Rad/Nuc Surveillance," by Hugh Manini, 1:30 p.m., Bldg. 211, room 227. Property protection area. Foreign national temporary escorted building access procedures apply. Contact: Hugh Manini, 3-9928, or Pat Smith, 2-8210.

Thursday
22

NAI/R DIVISION

"Libyan Redirection Initiatives: A New Partnership," by Eileen S. Vergino, Mo Bissani, Andrew F. B.

Tompson and Monika C. Witte. 1:30 p.m., Bldg. 132S, room 1000. Building access requires "L" or "Q" badge. Individuals without an "L or Q" Clearance should make arrangements to be escorted. Property protection area. No temporary building access for foreign nationals. Contact: Ruth Wright, 3-7328.

Friday
23

IGPP/INSTITUTE FOR GEOPHYSICS AND PLANETARY PHYSICS

"Cosmological Applications of Close Pairs of Quasars," by

Joseph Hennawi, U.C. Berkeley. Noon, Bldg. 163, room 219. Property protection Area. Foreign national temporary building access procedures apply. Contact: Wil van Breugel, 2-7195, or Lisa Lopez, 3-0250.

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

Please submit your meetings via the Technical Meeting Calendar form on the Web, located at <http://www.llnl.gov/tmc/index.html> For information on electronic mail or the newsgroup llnl.meeting, contact the registrar at registrar@llnl.gov.

AROUND THE LAB



Technique allows carbon dating of tooth enamel

By Charles Osolin

NEWSLINE STAFF WRITER

The radioactive carbon-14 produced by above-ground nuclear testing in the 1950s and 1960s is providing forensic scientists with a more precise way to determine a person's age at the time of death. The method could help in the identification of victims of Hurricane Katrina and other large-scale disasters.

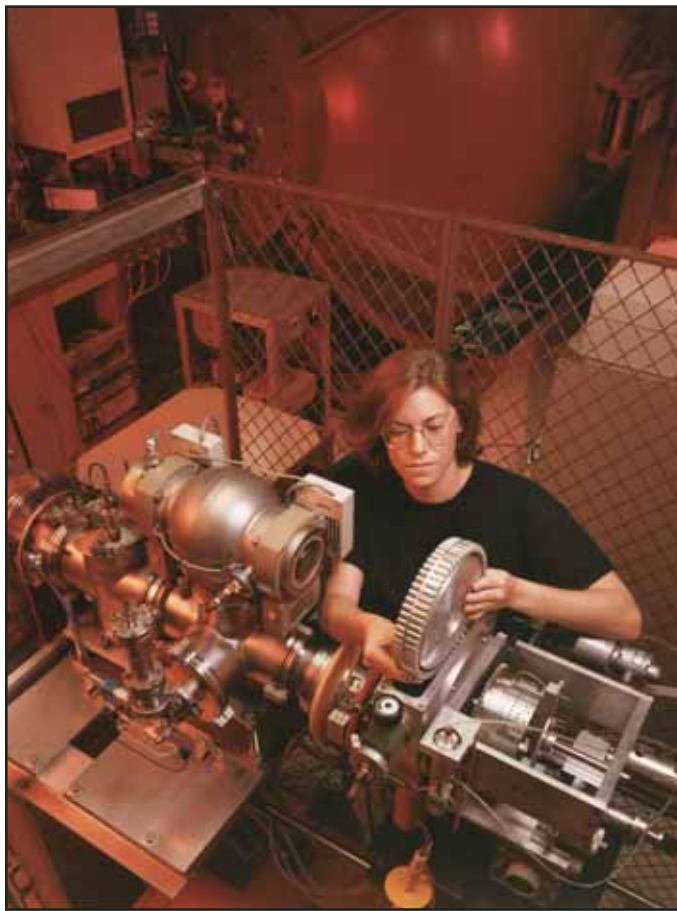
The new technique, developed by researchers at the Laboratory's Center for Accelerator Mass Spectrometry (CAMS) and the Karolinska Institute in Sweden, determines the amount of carbon-14 in tooth enamel. Scientists can relate the extensive atmospheric record for carbon-14 to when the tooth was formed and calculate the age of the tooth, and its owner, to an accuracy of within about 1.6 years.

"Unlike most other tissue, dental enamel doesn't turn over," said Bruce Buchholz of CAMS, where the enamel samples were analyzed. "Whatever carbon gets laid down in enamel during tooth formation stays there, so tooth enamel is a very good chronometer of the time of formation.

"We were surprised at how well it worked," he said. "And if you look at multiple teeth formed at different times, you can get (the age range) even tighter." Previous techniques, such as evaluating skeletal remains and tooth wear, are accurate only to within five to 10 years in adults, Buchholz said.

The research was reported in this week's edition of the journal *Nature*.

Buchholz said Swedish forensic scientists already have used enamel dating to help narrow the search for victims of last December's tsunami in Southeast Asia. "After a few days in the water, it's very hard to identify someone," he said. "You can't use (enamel dating) to identify a person — that requires a DNA analysis — but you can narrow down the number of people you need to look at



Researcher Michael Kashgarian loads the 64-sample source turret of the mass spectrometer at LLNL's Center for Accelerator Mass Spectrometry.

from a list of missing people."

Livermore officials are providing information on the enamel dating technique to federal agencies as part of the Laboratory's scientific and technical assistance in response to Hurricane Katrina. LLNL also is assisting in setting up emergency high-bandwidth communications and wireless networks. The Laboratory's Micropower-Impulse Radar (MIR) technology also is being deployed to assist search

and rescue crews in locating hurricane victims. This same technology was deployed in the days following the September 11 attacks in New York's World Trade Center rubble. (See related story, page 1.)

Carbon-14, or radiocarbon, is naturally produced by cosmic ray interactions with air and is present at low levels in the atmosphere and food. Atmospheric testing of nuclear weapons from 1955 to 1963 produced a dramatic surge in the amount of radiocarbon in the atmosphere, Buchholz said.

"Even though the detonations were conducted at only a few locations, the elevated carbon-14 levels in the atmosphere rapidly equalized around the globe," he said. Since atmospheric testing was banned in 1963, the levels have dropped substantially as the carbon-14 reacted with oxygen to form carbon dioxide, which was taken up by plants during photosynthesis and mixed with the oceans.

"Because we eat plants and animals that live off plants, the carbon-14 concentration in our bodies closely parallels that in the atmosphere at any one time," he said.

Buchholz and his colleagues analyzed 33 teeth from 22 different people whose ages were known. The enamel separations were done at the Karolinska Institute, and sample preparation and accelerator mass spectrometry analysis was done at CAMS.

The enamel dating technique doesn't work for people born before 1943, because all of their teeth would have been formed before atmospheric testing began in 1955.

In their *Nature* paper, Buchholz and his colleagues note that the technique for carbon-14 analysis using accelerator mass spectrometry is becoming increasingly sensitive and inexpensive, suggesting that even though nuclear testing was conducted decades ago, enamel dating could be used for precise age determination "for a long time to come."



PHOTOS BY JACQUELINE MCBRIDE/NEWSLINE

Officer Glenn Carroll (above) explains contraband items on display to Jim Travis of Engineering as part of a law enforcement exhibit at Thursday's Safety Fair outside Health Services.

At right, Yvonne Johnson of the TID Library gets a blood pressure check from Lori Kilgore during the Health Services Department's open house, held in conjunction with the annual Safety Fair.



Safety fare for everyone

OPSEC reminds employees: 'Better shred than read'

In a recent bulletin from Operations Security (OPSEC), employees are reminded that protecting sensitive information is serious business. Trash and recycle bins can be risky places for this material. Shredding is the most secure way to protect and destroy this information and eliminates the risk of it falling into the "wrong hands." And shredded paper is recyclable.

What should be shredded? Shred any unclassified information that you wouldn't want to fall into the "wrong hands" and leave LLNL or yourself vulnerable. Shred Unclassified Controlled Information (UCI) and Official Use Only (OUO) including: UCNI, DOE defined OUO, Export Control Information, Applied Technology info, etc.; personal information with data such as Social Security numbers, birth dates, passwords, addresses, badge/security information, credit card information, health records, etc.

Here are some helpful reminders on shredder use:

- Use the right shredder: Ensure that the shredder

you are using is approved for the type of material you are going to shred. Sensitive data (e.g., UCNI, OUO) needs a crosscut or strip-cut shredder producing strips less than one-quarter-inch wide. All classified material without a document number can be shredded in a Security-approved classified shredder. All other classified, including destruction of all accountable documents, must be coordinated through your classification administrative specialist (CAS).

- Shredders should be positioned so that they are safe and accessible. Place shredders in key areas where your "critical" or sensitive information is being generated so that they will be used.

- Follow manufacturer's instructions for the proper operation and number of pages that can be shredded at one time. Make sure the machine is off when clearing jams and opening the machine. Be careful. Shredders



Integrated Safeguards
& Security Management

will shred most anything - including loose clothing, badges, etc.

- If your shredder can handle viewgraphs, shred viewgraphs first, one by one. Place the viewgraph between two pieces of paper to avoid melting the viewgraph on the cutting wheels.

For more information:

- Classified information: Contact your CAS or call the Classified Matter Protection and Control Office at 3-8119 for proper destruction guidance for classified documents.

- Unclassified information: Contact the Office of Classification and Export Control at 3-3194 or see LLNL's Unclassified Controlled Information (UCI) Website: <http://www-r.llnl.gov/securityprogram/uci/uci.html>

- Shredder information: Contact the Technical Security Section at 3-8073.

HOME

Continued from page 1

campaign. Patti Lann, chairperson, said "this year, we have set a goal to raise \$1,600,000."

Like its predecessors, past directorate sponsors, DNT hopes to take the annual fundraiser to new heights with contributions to help hundreds of different agencies tackle real issues such as homelessness, early childhood development, health research, animal rescue, and environmental concerns.

The agencies are the heart of the HOME campaign. So this year, to gain a better understanding of the work done by agencies registered with HOME, the committee introduced "At HOME in our community" projects — activities organized during each month leading up to the kick off date — featuring an agency.

On July 23, more than 50 Lab employees worked in high temperatures to help build homes in Livermore, working with the East Bay Habitat for Humanity. Chelle Clements, coordinator for the "At HOME in our community" projects, said, "We had so much fun painting and cleaning and doing construction work and preparing the street for surfacing that hot Saturday in July because we accomplished so much."

During the first three weeks of August, the committee set up collection areas where employees donated more than 60 backpacks and 13 boxes of school supplies — pencils, pens, markers, crayons and glue sticks — along with gift certificates for shoes, for the "Back-2-School Giveaway" sponsored by Tri-Valley Jubilee in Livermore. On August 18, the backpacks



LINDA NULL/TID

Local students show off their new backpacks during the "Back 2-School Giveaway" sponsored by Livermore's "Tri-Valley Jubilee," one of the agencies featured in the "LLNL at HOME in our community" program supported by the 2005 HOME Campaign committee.

were distributed to jubilant students.

"At HOME" activities will continue this month. On the evening of Sept. 29, the HOME committee will sponsor bingo for patients at the Livermore Veterans Administration Hospital.

In addition to the planned projects to highlight agencies, there was an unplanned force of nature that prompted Lab employees to reach beyond their own backyards and help others — the victims of Hurricane Katrina. HOME accepted early one-time donations to relief organizations specified by employees. Employees donated by check at the Lab's cafeterias, where volunteers collected more than \$30,000.

HOME will open online donations for hurricane relief Sept. 19-23. These will be one-time only donations that will be deducted from the Oct. 1 paycheck (for monthly paid employees) and Oct. 14 paycheck (for bi-weekly employees).

growth — make growth possible and relatively fast — in areas where the nanotubes need to grow. In the simulations, the scientists used different initial conditions of carbon coverage on the iron nanoparticles. The carbon atoms bonded to the iron, forming chains which eventually interconnected to form a sheet composed of pentagons and hexagons.

"We were surprised to see that carbon and iron do not mix at the nanoscale during growth, and that the tubes grew capped. While this process has been studied extensively experimentally, it has not been well understood at the microscopic scale," Galli said. "Our simulations were able to clarify the growth of nanotubes on small metal nanoparticles and thus help the experiments aimed at controlled growth of nanotubes."

Quantum simulations of the type used by Galli and coworkers to study nanotubes are playing an increasingly important role in understanding matter at the nanoscale. Specifically, Lab researchers have been exploring the use of semiconducting nanomaterials as sensors and detectors for biological and chemical agents.

Galli worked with Livermore colleague Francois Gygi of Computation along with University of Leige collaborator Jean-Yves Raty (a former postdoc in

Galli's group at Livermore) on the research.

In further research appearing in the same issue of *Physical Review Letters* (and then selected for the Sept. 5 issue of *Virtual Journal of Nanoscale Science & Technology*), Galli and PAT colleague Andrew Williamson in collaboration with University of Cambridge researchers Neil Drummond and Richard Needs used quantum simulations to explore the properties of diamondoids — an alternative form of nanostructured carbon.

Diamondoids are tiny pieces of crystalline diamond, whose surfaces are covered with hydrogen. Interest in diamondoids has surged in recent years, following the discovery by ChevronTexaco that they can be extracted from crude oil reserves.

"Diamondoids are expected to have several technologically useful optoelectronic properties," Williamson said. "Our calculations predict that diamondoids could be used to coat the surfaces of electron-emission devices. The smallest diamondoids emit ultraviolet light, which can be used to process organic waste."

The research teams used the Lab's high performance computers for their simulations. The work was funded by the Laboratory Directed Research and Development program.

HOME countdown

The countdown continues to the 2005 HOME campaign with only 26 days until the "Run for HOME." Be part of a Lab tradition. Get some exercise, have some fun and most important, meet the numerous agencies participating in this year's HOME campaign.

Employees share thoughts on HOME

During the weeks leading up to the "Run for Home" *Newsline* will feature comments from employees who were asked, "Why is it important to participate in the HOME Campaign?"

"Home is an opportunity to help organizations that are closest to our hearts. Most of us don't have time or energy to do all that we would like, but we can give our finances. Doing this through the HOME Campaign shows the community that it is due to the blessing of having a job at LLNL that we are able to help. Standing together in a group as large as LLNL, we can make a difference even with a small monthly donation; and, if we gather some friends or co-workers that have a similar heart, it can make a huge difference."

— JENNIFER GIBSON-GREENWOOD,
PROCUREMENT

NANOTUBES

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nanotubes grow has been of keen interest to scientists. The more their growth structure is understood, the more likely it is that researchers can manipulate the use of nanotubes in technological applications.

Livermore scientists recently performed a series of quantum molecular dynamics simulations aimed at understanding the early stages of carbon nanotube growth on metal nanoparticles. The researchers used a one-nanometer piece of iron as a catalyst because iron has been shown to have the highest carbon nanotube production rates.

"One challenge is to be able to grow nanotubes in a controlled way, such as placing them exactly where they are needed on a surface or in a device," said Giulia Galli of the Physics and Advanced Technologies Directorate (PAT), one of the authors of the research that appeared in the Aug. 26 issue of *Physical Review Letters*. This research is also presented as a highlight in the Sept. 8 issue of *Nature Materials*.

To understand the early stages of nanotube growth, the group placed metallic nanoparticles that spur

LIBYA

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member states of the Treaty on Nonproliferation of Nuclear Weapons (NPT).

Libya agreed in December 2003 to verifiably dismantle its program to build weapons of mass destruction, freeze its nuclear activities and limit the range of existing missiles to 180 miles. In early 2004, Libya's nuclear program shipped 500 tons of weapons-related material to the U.S., returned uranium reactor fuel to Russia and signed the Additional Protocol to the International Atomic Energy Agency's Safeguards Agreement.

Bissani, Andrew Tompson of LLNL's Earth and Environmental Sciences Directorate, and Jim Trebes of the Physics and Advanced Technologies Directorate were part of a U.S./United Kingdom delegation that went to the Libyan capital of Tripoli in October 2004 to discuss areas of cooperation with the Libyans.

"We were very well received and people were excited to see us come back," Bissani said, noting that economic sanctions had isolated Libya's scientific community. "Libyan scientists and engineers are especially excited about collaborating. There's a great deal of optimism about the benefits of collaboration."

Many Libyan scientists and engineers were educated and trained in the West and are eager to renew ties with their alma maters, professors and professional colleagues, Bissani said.

Sanctions made it difficult for Libyan researchers to remain current in scientific advanced developments and to obtain new equipment. "However, the fundamental science is very good and they have a great deal of scientific and technical expertise," Bissani said.

The Laboratory's effort to redirect the research of Libyan weapons scientists to civilian purposes is led by Eileen Vergino of the Center for Global Security Research, and she will build on the Lab's experience working with scientists in the former Soviet Union.

While there are some important differences — Libya has industry and a more developed commercial sector —



Members of the U.S. delegation and their Libyan hosts at the entrance to the Tajura Research Reactor facility near the Libyan capital of Tripoli. U.S. delegates from left are: Jason Coombs of Sandia National Laboratory; Cindy Mentz of the Civilian Research and Development Foundation; Monte Mahlin of DOE/NNSA; Ken Apt, DOE/NNSA; Mo Bissani, LLNL; and Maggie Manning, DOE/NNSA.

the program will afford the opportunity to work scientist-to-scientist, Vergino said. "This is all about contacts, relationships and building trust. You do that through scientist-to-scientist collaboration.

"This is an exciting opportunity. We have relationships with three North African countries with prospects for regional cooperation in areas of mutual interest such as water resources management and border security," Vergino said. "This is an example of how we can use science as a tool for regional stabilization."

After a second trip to Libya by a sister Lab team in July of this year, areas for immediate collaboration were identified: radiation protection and health physics; environment, safety and health and quality assurance; research reactor management, maintenance and operations; radioisotope production for medical purposes and related facility improvements.

The second LLNL sister Lab team that visited Libya this summer included Becky Failor, Dewey Sprague and Dawn Banghart of the Safety and Environmental Protection Directorate. They met with representatives of Libya's National Bureau of Research and Development and Renewable Energies and Water Desalination Center. The team assisted the Libyans in evaluating their existing programs in radiation protection and health physics and in

environment, safety and health as part of the effort to identify areas for cooperation.

A key area of focus for the redirection initiatives is the establishment of the Center for Mechanical Industries (CMI), which will serve as a state-of-the-art facility for the design and development of commercial products in Libya and thus provide for the redirection of scientists, technicians and their facilities formerly involved in the weapons program. The Center will also be used in training programs as well as in support of university research and thus will serve as a technical resource for various technical industries and universities in Libya.

Vergino said that establishing the CMI as well as a vocational training center is a key to getting the redirection program off to a good start. This effort is led by Monika Witte along with a team from the Manufacturing and Materials Engineering Division (MMED).

Longer term areas of potential collaboration include: environmental monitoring of air, water and soil; desalination and water purification; soil and water remediation; chemical waste treatment; and management of hydrocarbon sludge from oil tankers and storage tanks.

"The idea is for this program to serve as a model, demonstrating the benefits of collaboration to other nations," Bissani said. "The U.S. is showing in good faith the rewards for countries that come clean on their weapons of mass destruction."

Other nations participating in DOE/NNSA's Sister Laboratory Program include Mexico, Peru, Argentina, Romania, Morocco, Egypt and Thailand.

"We're looking forward to getting these collaborations under way in the near future," Bissani said.

Bissani, Vergino, Tompson and Monika Witte will discuss "Libyan Redirection Initiatives: A New Partnership," in an NAI colloquium at 1:30 p.m. on Thursday, Sept. 22 in Bldg. 132S, room 1000. Building access requires an "L" or "Q" badge. Individuals without an "L" or "Q" clearance should make arrangements to be escorted. This is a property protection area: no temporary building access is allowed for foreign nationals. Contact: Ruth Wright, 3-7328.

RECOVERY

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The Laboratory received a request for its technologies from the New Orleans Federal Emergency Management Agency (FEMA) team, according to T.R. Koncher, assistant director for policy in LLNL's National Security Office.

"We are exploring some new ground. They've asked us to demonstrate the capabilities of the technologies and they are going to match it to their needs," Koncher said.

One of the technologies deployed is the latest generation of the Lab's micropower impulse radar (MIR), called "Urban Eyes," which can detect motion — such as respiration or hand waving — up to 25 feet through two walls, including eight-inch concrete.

"Urban Eyes" consists of one, two or more small, low-power radar sensors and a wireless visual display. Sensors can be carried by hand, mounted on a tripod or attached to a robotic vehicle.

The MIR technology was used to search for trapped victims at the World Trade Center in New York City in the aftermath of the September 11 attacks. Field demonstrations and scenario-based training with FEMA's Urban Search and Rescue Task Force members have been conducted at the NASA Ames Collapsed Structure facility. Additional collaborations have been in place at other Department of Defense facilities, including the Naval Postgraduate School.

A second LLNL technology, ultrawideband communications, can provide audio and video links in harsh environments, such as collapsed buildings or tunnels. The system can record communication signals inside collapsed structures and heavy debris and relay the signals to command and control centers, in many instances with a 10-fold improvement over more traditional means of communication.

A third technology, an enhanced night vision system better than commercial versions now available, provides upgraded performance and could aid in the search environ-

ment.

"We feel privileged to have the opportunity to send our people, expertise and technology to the Gulf Coast area to attempt to help the people there," said John Chang, the Lab's MIR program leader. "I'd also like to express my appreciation to our team members and their families for the sacrifices they've made to volunteer and help those in need."

The Lab's Biodefense Knowledge Center, or BKC, is providing computational tools that are being used as a "central control" for handling and tracking requests for assistance, and as infrastructure for information sharing between the Department of Homeland Security (DHS) and several national labs.

The BKC is part of the national effort by DHS to prevent and respond to bioterrorist attacks.

The DHS-led Interagency Modeling and Atmospheric Assessment Center (IMAAC) has been placed on alert by the Homeland Security Operations Center. The National Atmospheric Release Advisory Center (NARAC) at LLNL is the designated primary interim provider of IMAAC capabilities.

The IMAAC has provided airborne hazard predictions for potential fires and toxic chemical releases in the areas affected by Hurricane Katrina. The role of IMAAC is to coordinate and serve as the single federal source of plume model predictions during incidents of national significance.

The IMAAC is working with the National Oceanic and Atmospheric Administration (NOAA) HazMat operations center in Seattle, and via them with the NOAA scientific support coordinators. The coordinators are deployed to the region in support of unified commands, the Environmental Protection Agency, FEMA and Louisiana agencies that have been providing valuable local information on hazardous chemical facilities and analyses of potential toxic chemical hazards.



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