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## T<sup>2</sup> EVENTS

International Space Congress &  
International Space Exposition  
Hyderabad, India  
September 24-28, 2007

National Manufacturing Week  
Chicago, Ill.  
September 25-27, 2007

Tech Transfer & Early Stage  
Investing Conference  
Boston, Mass.  
October 17-18, 2007

SSTI 11th Annual Conference  
Baltimore, Md.  
October 18-19, 2007

FLC Mid-Atlantic Region  
Annual Meeting  
St. Michaels, Md.  
October 22-24, 2007

2007 Earth Sciences for Society  
Denver, Colo.  
October 28-31, 2007

## T<sup>2</sup> FACT

Bayer came up with the name aspirin. It comes from the 'a' in acetyl chloride, the 'spir' in spiraea ulmaria, and the 'in' was a then familiar name ending for medicines. In 1915, the first aspirin tablets were made. Interestingly, Aspirin<sup>®</sup> and Heroin<sup>®</sup> were once trademarks belonging to Bayer. After Germany lost World War I, Bayer was forced to give up both trademarks.

- Mary Bellis, About.com

# FLC NEWS LINK

September 2007

## FLC CHAIR LINSENMAYER BIDS FAREWELL

by Ed Linsenmeyer, FLC Chair



To all of my  
friends in the FLC:

It is time to say  
goodbye.

After four years  
as Chair of the  
FLC, I am turning  
over the reins of  
leadership to Dr.  
Scott Deiter. I wish  
him well during  
his tenure, and ask

that you continue to support him as well as  
you have supported me.

Management of the FLC is easiest when the  
members and elected officials work together  
in a collegial relationship to accomplish their  
goals and objectives. It has been a great pleasure  
for me to have participated in such a relationship  
and to have been part of the FLC family during  
the past 15 years. Many of my

*FLC Chair Bids Farewell, page 5*



Technicians remove rubber from an airfield in South Carolina.

## ENGINEERS DEVELOP MINIATURIZED RUBBER REMOVAL PACKAGE FOR RUNWAYS

Engineers with the Air Force Research Laboratory's Materials and Manufacturing Directorate (AFRL/ML) Airbase Technologies Division, at Tyndall AFB, Fla., developed a miniaturized, easily portable and multi-use system to remove runway rubber. Use of this system will

ensure that runways are kept free of rubber and are safe for aircraft landings.

The development of this new system provides a highly effective and easily transportable solution to runway rubber removal. The system's removal capability exceeds Air Force standards and provides

a safe, ready-to-use runway. The system also has the potential to be a multi-use system for runway repair as well.

During aircraft landing, prior to the actual touchdown, the tires are at rest, experiencing no rotation.

*See Rubber Removal, page 4*



A test flight of the mini-helicopter with its payload near Albuquerque, N.M.

by Todd Hanson

When disasters like the recent bridge collapse in Minnesota occur, elected officials and the general public alike are often left wondering what can be

## WHEN DISASTER STRIKES

done to avert such tragedies in the future.

In many cases, it often falls to America's national laboratories to research and develop advanced scientific and technical solutions to these issues of national safety and security.

In the case of the Minneapolis bridge collapse, engineers working in Structural Health Monitoring at Los Alamos National Laboratory's

(LANL) Engineering Institute may already be well on their way to developing an engineering solution to the challenge of monitoring bridges.

Engineering Institute Director Chuck Farrar and his students are working on a technology using radio frequency identification (RFID)-based sensing, in-situ data analysis, and model-based reasoning for the rapid, economical, and reliable assessment of changes in and damage to large concrete and steel structures such as bridges.

One such RFID project is being developed by David Mascareñas, a doctoral student from the University of California-San Diego's Jacobs School of Engineering who is now working at the Engineering Institute. His project would use electronic sensors powered by microwaves to gather and send data via radiotelemetry to an airborne

*When Disaster Strikes, page 6*

# FED LABS FLASH | TECHNOLOGY TRANSFER NOTES

## WU NAMED TO COMPUTERWORLD'S "40 UNDER 40" LIST OF RISING STARS

Associate Professor Min Wu of the University of Maryland's Institute of Advanced Computer Studies has been selected as one of *Computerworld's* 40 innovative information technology people under the age of 40 to watch.

The special feature appears in the magazine's 40th anniversary issue this month.

Wu was chosen for the "40 Under 40" list for her innovative research in information security forensics.

Wu and her colleagues have developed an invisible ID that can be embedded in digital content, such as films, music and pictures, to protect it from unauthorized use.

"Without a way to protect intellectual property, we will see a lot of hurdles to new technology put up," Wu told *Computerworld*. "My focus is working toward further innovation of new technologies."

To read the story, visit the *Computerworld* website at <http://computerworld.com>.

## BLM TO FACILITATE RENEWABLE ENERGY DEVELOPMENT ON FEDERAL LANDS

by Heather Feeney, BLM Public Affairs



In response to the increased national demand for clean renewable energy, the Bureau of Land Management (BLM) recently announced it will prepare a programmatic environmental impact statement (PEIS) analyzing areas with high potential for geothermal energy development.

According to a notice published in today's *Federal Register*, the PEIS will examine the environmental impacts of boosting geothermal leasing in areas with high potential for near-term exploration and development of geothermal resources.

If deemed appropriate by the PEIS, the BLM will amend the land use plans in those areas to allow for expanded leasing.

"The BLM is sitting on the largest supply of geothermal energy in this country, and it is time to launch an aggressive program to develop those resources," said BLM Acting Director Jim Hughes. "This proceeding will help us

determine which areas to concentrate our geothermal leasing efforts on." The PEIS will focus on areas with high geothermal potential in 11 western states and Alaska. These areas will include those identified by the BLM, the U.S. Forest Service, and the U.S. Geological Survey, as well as by the public and other stakeholders. The entire west is being considered, including areas in northwestern Nevada, northeastern California, and the Raft River Basin in Oregon.

"The Forest Service looks forward to working in concert with BLM on these

geothermal projects," said Forest Service Chief Gail Kimbell. "Enhancing our nation's energy needs through safe and clean energy is an important focus of the Department of Agriculture and a proper use of our public lands."

The PEIS will also analyze the steps necessary to facilitate the processing of the approximately 100 geothermal lease applications that were pending as of January 1, 2005, as mandated by the Energy Policy Act of 2005. The law stipulated that 90% of these applications must be issued, rejected, or otherwise disposed of by August 8, 2010.

Geothermal resources, such as steam and hot water, are used directly to heat buildings and in greenhouses and aquaculture, and indirectly to generate electric power.

Geothermal energy accounts for 17 percent of the electricity generated from renewable sources in the U.S. Half of the nation's geothermal energy production occurs on federal land, much of it in California and Nevada, and 90% of the potential resources are located on public lands as well.

## ARMY COMMUNICATIONS AND ELECTRONICS CENTER TO LAUNCH LARGEST FUTURE TECHNOLOGY DEMO

The Army's Communications-Electronics Research, Development, and Engineering Center (CERDEC) is executing the largest future force Command, Control, Communication, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) and networking demonstration to date.

The 2007 C4ISR On-The-Move Technology Demonstration is assessing the technical capability, functionality, maturity, and performance of future combat system (FCS) technologies, FCS spin-outs, and candidate technologies for insertion into the current force.

The demonstration incorporates over 100 live communications, sensor and

battle command systems complemented by a brigade-sized element represented in virtual and constructive simulation.

This year's event builds on the accomplishments of the 2006 event, both in the number of systems and in the complexity of their interconnection, and represents the largest future force network architecture to date.

The technology demonstration features five axes of exploration, which include system-level assessments, integrated system-of-system thread evaluations, and technology assessments utilizing soldiers in a relevant environment.

These axes are each designed to support stated programmatic Army and/or

Department of Defense requirements.

The demonstration will provide the Army and sister services with a venue for quantifying integrated C4ISR; exploring tactics, techniques, and procedures; and facilitating technology transition to programs of record.

Additionally, it is serving as a risk reduction/mitigation and systems integration venue for Empire Challenge 2007, Air Assault Expeditionary Force Spiral D, and Joint Expeditionary Force Experiment (JEFX) 2008.

More info: [www.cerdec.army.mil/news/c4isr\\_otm.asp](http://www.cerdec.army.mil/news/c4isr_otm.asp)

## FLC NEWSLINK

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# TECH WATCH | LABORATORY TECHS READY FOR TRANSFER

## COOKING BETTER STEAK



Agricultural Research Service (ARS) scientists in Nebraska have developed novel genetic markers to identify cattle with superior potential for producing tender meat.

Meat tenderness is the major determinant of consumer satisfaction with beef, and consistent meat tenderness is a top goal for U.S. beef producers.

Many environmental factors can influence tenderness, but genetics plays a role as well. ARS researchers identified three single nucleotide polymorphisms (SNP) in a particular gene, which can be used in animal breeding programs to identify superior animals with respect to meat tenderness.

ARS laboratory data indicate that 13 percent or more of U.S. beef cattle carry undesirable forms of the gene that increase the risk of producing less tender meat.

*More info:* Tara T. Weaver-Missick, 301-504-6965, twm@ars.usda.gov

## TREATING DISEASE

John Ortaldo and Robert Wiltout of the National Cancer Institute have discovered that C12 beta-D-galactosyl ceramide may be used to deplete or inactivate NKT cell populations. These findings suggest methods for using C12 beta-D-galactosyl ceramide to treat conditions that would benefit from depletion of NKT cells, such as certain autoimmune diseases (e.g. lupus, multiple sclerosis) and AIDS. The presence of NKT cells can be associated with either beneficial effects or pathology. Deficiencies in NKT cells are associated with at least some types of autoimmune disease, including type 1 diabetes and autoimmune gastritis in mice. In contrast, NKT cells augment autoantibody secretion and lupus development in lupus-prone mouse models, and therefore lupus patients may benefit from the depletion of NKT cells. The remission state of multiple sclerosis is also associated with decreased levels of NKT cells, suggesting NKT cell depletion as a method of treatment for multiple sclerosis.

**Licensing Status:** Available for exclusive or non-exclusive licensing.

*More info:* Jennifer Wong, 301-435-4633, wongje@mail.nih.gov

## BNL'S TECH FOR ATMOSPHERE, ENGINES, PHARMA

Research in the Atmospheric Sciences Division at Brookhaven National Laboratory (BNL) has resulted in the development of a new analytical instrument capable of measuring aerosol size distribution with high time and size resolution. Aerosols refer to particles, including solids, liquids and mixtures of such suspended in a gas, such as the atmosphere.

The aerosol mobility size (AMS) spectrometer eloquently addresses the need to increase measurement speed by integrating the classification, detection and counting of aerosol particles.

Using the AMS spectrometer, aerosol particle size data can be produced in about 1 second, an improvement by a factor of 50 over current technologies such as scanning mobility particle sizers, which must scan data of individual sizes of aerosols over a range of voltages. Further, the AMS spectrometer improves upon optical particle counters, which use light scattering and have a lower signal-to-noise ratio than the AMS spectrometer.

Essentially, the AMS spectrometer separates charged particles in an aerosol flow stream based on their electrical mobility into different trajectories of size-ordered aerosol flow streams upon application of a uniform electric field. The apparatus has an improved counting rate over current technologies, while it can also detect particles smaller than 100 nm in diameter. Particle sizes in the submicron size range often dominate the number concentrations of atmospheric aerosols.

The ability to quickly capture transient aerosol dynamics occurring on very small time scales, such as in

high-temperature environments or other nucleation-dominated systems is a desired need for a variety of fields. Recent research has clearly demonstrated the significance of atmospheric aerosols on climate and air quality over regional and global scales. In addition, the Intergovernmental Panel on Climate Change (IPCC)

asserts that the effects of aerosols are the most uncertain components in the climate system. In addition, the study of aerosol particle size distribution is related to research on the penetration of aerosol into bronchial airways and the associated health effects (e.g., for environmental pollutant release studies, or inhalant research in the pharmaceutical field or in medical devices generally).

Thus, aerosol size distribution measurement is an important analytical tool for a broad range of fields from atmospheric science and combustion systems to medical and pharmaceutical applications of aerosols.









## Innovation at Work

Be a part of the only open event on sensing, detecting, and imaging technologies for defense and security. The face-to-face collaboration between researchers from multiple disciplines at this event has accelerated technological advancement and discovery in defense and security, making this the largest event of its kind in the world.

U.S. Marine photo by Cpl. Spencer M. Murphy  
U.S. Air Force photo by Master Sgt. Lance Ching

16-21 March 2008 | Exhibition: 18-20 March 2008  
Orlando World Center Marriott Resort & Convention Center  
San Diego, California, USA



spie.org/events/dss

*Rubber Removal, from page 1*

At the point of impact with the asphalt, the aircraft is moving at a speed of 100 knots (115 miles per hour), so the tires must reach a rotational speed to match the aircraft speed in a very short amount of time.

This causes superheating of the tires, as well as skidding, which leaves rubber deposits on the runway. The tires also leave rubber deposits while braking when the aircraft is coming to a stop after touching down. Rubber buildup on a runway is very dangerous because during wet weather conditions it creates a significant risk for incoming aircraft to slip off the runway while braking.

Currently, the most common method of cleaning rubber off of Air Force runways is the use of detergent cleaners. The size of the equipment it takes to apply detergent cleaners to the runways has increasingly become a problem because it currently takes two C-17 aircraft to deliver a runway cleaning system to its intended destination.

This has had a noticeable impact during Operation Enduring Freedom because the aircraft used to transport the system have other missions to provide support to the operation and to military personnel.

Engineers at ML were tasked with providing a miniaturized rubber removal system that wouldn't require more than one aircraft to transport it. The engineers had four main goals: determine the equipment that would be the most successful in removing the rubber while maintaining low weight, identify other possible uses for the equipment if it is successful in removing the rubber, assemble a package for testing on Air Force runways, and test the equipment on both asphalt concrete and Portland cement concrete runways.

The engineers decided to continue to use Avion 50 detergent by Chemtek, Inc., as the standard detergent for cleaning the runways. Once that decision was made, they began looking at possible components to make the new system.

The engineers created a system that had two primary pieces of equipment: a Bobcat Toolcat with a broom and skid-loaded spray attachment as the main

vehicle and a PBM Supply & Manufacturing nurse trailer with dust control spray nozzles that provides water during the cleaning if a water vehicle isn't available. The system also included secondary equipment as well: pumps to disperse the detergent and the water, a detergent applicator, and a water applicator to keep the runway damp during agitation.

Modifications were made to the components so that the system would perform as needed.

The broom was loaded with a combination of steel and poly bristles, which increases the movement of the water while the steel brushes scrub the runway.

The spray system was modified to spray 23 gallons a minute instead of 5 so the detergent could be properly applied. The electronic pump was replaced with a gasoline-powered pump, and the spray nozzles were replaced with tips that would spray droplets instead of mist to avoid excessive loss of detergent. The 75-gallon tank was replaced with a 200-gallon tank to would allow for extended working time.

Once the package was put together, it was tested on two runways, the North Auxiliary Field Assault Landing Zone in South Carolina, which is made of grooved asphalt, and the Shaw Air Force Base runway in Sumter, South Carolina, which is made of tinned Portland cement concrete.

The technicians started the removal process by applying the Avion 50 detergent to the runway at a rate of 55 gallons per 10,000 square feet. After the detergent was applied, they used the broom to agitate the detergent for 2.5 hours, while keeping the area damp. A significant amount of water was then added to get the detergent to foam, and agitation was continued for 30 minutes. This caused the rubber particles to be suspended in the foam. The runway was then rinsed for a period of 2.5 hours as the broom was used to move the rubber to the sides of the runway.

After the tests were complete, it was revealed that the new system had exceeded expectations by removing 90 to 95 percent of the rubber on the runways (the Air Force standard is 85 percent). It was

also found that in some cases the new system could accomplish the removal in less than the six-hour estimate. In the future the Toolcat could be outfitted with attachments for runway repair, such as a paint stripper, concrete saws, grinders and mixers.

A few minor system tweaks were required but, as a result of the positive testing results, Air Combat Command (ACC) requested that ML engineers put together two systems to turn over to ACC to field.

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*FLC Chair Bids Farewell, from page 1*

closest friendships have been as the result of membership in this organization. I will not single out the many who mentored, advised, and criticized me during this time, as I am sure to leave someone unrecognized—which I do not want to do. Instead, I will thank all of you.

More than 30 years ago, when technology transfer was new, legislation was needed to authorize technology transfer activities within the federal government. This legislation established a number of mandates for the FLC. As I look back at the accomplishments of the FLC in meeting these mandates, I am proud to say that we have made significant progress toward achieving the goals they established.

Training of technology transfer personnel was one of the major objectives of our original legislative mandates. It is clear that the FLC has been very successful at accomplishing this goal, offering the highest quality education and training activities through the national and regional meetings, as well as through a variety of publications. I know that, in the future, the FLC will establish an even broader range of training activities for laboratory managers, scientists, and engineers—as well as educational outreach opportunities for members of small and large businesses, and state and local governments.

In the early days of the FLC, the Internet was barely emerging from its ARPA origins as a tool that could be

used by people around the world. Now the FLC offers virtually instant access to the federal laboratories and their technologies through a variety of electronic information services. The FLC website, Technology Locator, *FLC NewsLink*, and national and regional e-mail roundtables provide Consortium members, managers and staff of federal technology transfer offices, and the general public with a networking service that is of incalculable value to the federal technology transfer mission. In addition, the FLC's highly professional technology highlights and technology transfer awards publications provide members of Congress and the Administration, state and local officials, and the general public with excellent information about the activities and successes of the federal laborato-

*FLC Chair Bids Farewell, page 8*

## DC ON T2: HOUSE, SENATE ADDRESS AMERICA COMPETE ACT

by Gary Jones, FLC Washington, DC Representative



Greetings from D.C. In the waning hours prior to the August recess, the House and Senate passed the conference agreement on the long-awaited “competitiveness” bill, the America COMPETES Act (H.R. 2272), which the President signed into public law on

August 9, 2007.

The bill (now law) is the culmination of great effort over the last two years to address several of the primary concerns identified in the National Academies' Report (“The Gathering Storm” – see this column for October/November 2005) presented to Congress in fall 2005, i.e., the need to increase basic research in the physical sciences and to emphasize math and science education (specifically, improving K-12 science and math teaching skills and attracting more students to the science, technology, engineering and math areas).

Recall that these concerns, along with the need to reform the current intellectual property system, immigration policy (to ensure foreign S&T students and workers can participate in the U.S. R&D enterprise), R&D tax credit policy for industry and to provide greater access to broadband, were identified in “The Gathering Storm” as important policy levers to help the U.S. maintain its dominant technological position in the world. Much of the language and emphasis from this report found its way into the President's 2007 budget in the form of the American Competitiveness Initiative (ACI), which focused heavily on physical science basic research funding and STEM education issues.

The congressional effort was spearheaded on the House side primarily by the Science and Technol-

ogy Committee (S&T) and on the Senate side by the Energy and Natural Resources (ENR) Committee. Sen. Jeff Bingaman, (D-NM), chair of the Senate ENR Committee, described the bill as “a landmark piece of legislation that will ensure that our nation retains its competitive edge for generations to come.” Rep. Bart Gordon (D-TN), Chair of the House S&T Committee, similarly expressed the notion that securing “a brighter future for our children is simply not a partisan issue. I'm proud that my colleagues and I have been able to work together to move this bill forward—this truly is a team effort.”

Unfortunately, the bill also eliminates the Department of Commerce's Office of Technology Administration which, among many other duties, facilitates the current Interagency Working Group for Technology Transfer. This is one part of the law we'll be sorry to see implemented. However, passage of this bill is only a first step in maintaining our technological competitiveness. As “The Gathering Storm” report clearly points out, basic research funding and STEM education comprise only two of the areas that require policy action to ensure the U.S. maintains its technological

### Highlights of the America COMPETES Act

- Keeping NSF, NIST, and DOE/Science on a near-term doubling path
- Authorizing \$33.6 billion (FY08-FY10) for STEM research and education programs government-wide (including \$150 million for K-12 STEM programs utilizing the capabilities at the national (i.e., DOE) labs specifically)
- Creating thousands of new teachers and improving skills of current teachers through the NSF Noyce Teacher Scholarship Program and Math and Science Partnership Programs
- Creating the Technology Innovation Program (TIP); essentially replacing the Advanced Technology Program (ATP) at NIST to fund high-risk, high-reward precompetitive technology development
- Establishing ARPA-E at DOE to support high-risk, high-reward energy research
- Expanding NSF programs to enhance undergraduate education of the future S&E workforce
- Authorizing two new competitive grant programs to support BS science degrees with concurrent teaching certification
- Authorizing competitive grants to increase the number of teachers in high schools and expanding advance placement / international baccalaureate programs
- Expanding early career grant programs supporting young investigators at DOE & NSF
- Strengthening interagency planning and coordination for research infrastructure and IT.

lead. Many of the other areas identified in the report are the subject of legislative initiatives or debate now underway on Capitol Hill. For example, comprehensive patent reform legislation is currently working its way through the House and Senate, immigration reform remains a priority for many stakeholders, legislation to increase and make permanent R&D tax credits for industry has been introduced, among others. The competitiveness law is a good first step, but we have much farther to go. See the House S&T Committee press release and the Senate ENR Committee press release.

Gary can be reached at [gkjones@fldc.cncbhost.com](mailto:gkjones@fldc.cncbhost.com).

# COGNITIVE S&T PROGRAM BECOMES SANDIA INITIATIVE



Randy Montoya

SNL researcher Rob Abbott uses a joystick and plays the role of a student in a training exercise driving an amphibious assault vehicle simulator used by the Navy and Marines. The second monitor is an instructor/operator application called CDMTS. In the background is a thermal image of a student's face used for investigating biometrics to monitor the student in various ways, including the level of engagement and focus of attention.

Imagine a world where a machine creates a "virtual you" by modeling how you think and your expertise on a subject. Or one where your car's computer appreciates your driving skills and compensates for your limitations.

That's the world Sandia National Laboratories (SNL) has entered full throttle through its Cognitive Science and Technology Program (CS&T).

A revolution is at hand, says Chris Forsythe, member of the SNL's cognition research team. It's not one of just better guns and weapons for national security. Instead, "it's a revolution of the mind — of how people think and how machines can help people work better."

A large portion of SNL's program today focuses on the uniqueness of the individual interacting with others and with machines. It involves using machines to help humans perform more efficiently and embedding cognitive models in machines so they interact with users more like people interact with one another. The result is the ability for researchers to take advantage of the basic strengths of humans and machines while mitigating the weaknesses of each.

Cognitive projects and research at SNL span a whole gamut of areas, ranging from student training to assisting with Yucca Mountain licensing, from designing "smart" cars to using video-like games to train military personnel, and from determining how neurons give rise to memory to global terrorist threat detection.

Funding for the research has come from the Office of Naval Research, SNL's internal Laboratory Directed Research and Development (LDRD) program, Department of Energy, the Defense Advanced Research Projects Agency (DARPA), and other government agencies. The CS&T program also benefits from collaborations with the University of New Mexico, the MIND Imaging Center in Albuquerque and, most recently, the University of Illinois at Urbana-Champaign.

The initial decision for SNL to develop cognitive technologies was based on the belief that "there are numerous positive impacts cognitive systems technologies can have on our national security," said Russ Skocypiec, senior manager of SNL's Human, Systems, and Simulation

Technologies Department.

Today's conflicts, he said, are unlike others over the past century. Although all wars are driven by humans, major influences on the outcomes have differed. World War I was a chemists' war, World War II a physicists' war, and the Cold War an economic war. Today, he believes, "we are engaged in a human war that is influenced primarily by individual human beings rather than technology or bureaucracy."

That is why he considers it appropriate for SNL, a laboratory with national security as its mission, to use its resources to better understand the minds of this country's adversaries, as well as to use machines to enhance SNL's abilities to recognize patterns, deal with massive amounts of data, solve perplexing problems, and perform complex activities.

While SNL dipped its toes in cognitive research in the late 1990s, its real effort in the area started in 2002 when the program won an internally funded LDRD grand challenge.

Based in part on the success and path set by the grand challenge in 2005, the former Mission Council — a group that

consisted of senior SNL vice presidents — selected cognitive science and technology (CS&T) as a research focus area for the labs.

During the spring and summer of 2006, the cognition team conducted two investigations. The first looked at what cognitive capabilities exist at SNL.

The second examined opportunities involving the convergence of SNL's initiatives in the areas of cognition, biotechnologies, and nanotechnologies.

"The plan is at the level of 'send a man to the moon' — beyond the scope of what any one institution can possibly do," Forsythe said. "It's a synthesis of ideas. Now, our intent is to home in on a few areas in which the labs can make a unique and profound contribution."

John Wagner, manager of SNL's Cognitive and Exploratory Systems and Simulations Department, said the new area of research means "profound opportunities exist for the Labs."

Wagner says that cognitive research at SNL — like most worldwide — is in its infancy. He anticipates that within the next decade research that seems like science fiction today will be a daily part of everyone's lives.

*When Disaster Strikes, from page 1*

computer for analysis. In this case, the computer would be airborne thanks to a radio-controlled (RC) helicopter that Mascareñas has retrofitted to serve that function. Low-cost sensors placed on a bridge or similar architectural entity would detect electrical charges emitted by stress on materials, such as the steel-reinforced concrete used to construct many bridges, and transmit the signals back to a receiver in the helicopter as it passes.

"Using RDIF and a RC helicopter, David has developed a potentially cheaper, safer, and easier way to monitor the structural health of our nation's bridges, which ultimately helps keep both bridge inspectors and the bridge users safer," said Farrar.

In 2006, Mascareñas became the first student in Jacobs School of Engineering to complete its new multidisciplinary

degree program in structural health monitoring, damage prognosis, and validated simulations. The program is now one of several that are under the auspices of LANL's new National Security Education Center.

Structural health monitoring capitalizes on continuing advances in sensors, electronics, and communications to develop sophisticated technical and scientific methods for monitoring the condition, or so-called "structural health," of buildings, bridges, dams, and other important elements of the national infrastructure.

In the next several weeks, Mascareñas, Farrar and their research team will be traveling to a bridge near Truth or Consequences, New Mexico, to test the technology in the field. After that, it may someday be coming to a bridge near you.

# LAB CLASSIFIEDS | AVAILABLE TECHNOLOGIES, FACILITIES, AND PARTNERS

## ANL'S NANOLUBE

Federally mandated reductions in the amount of sulfur allowed in diesel fuels and lubricating oils will significantly reduce particulate emissions from diesel-fueled vehicles. However, removing the sulfur reduces the lubricating capacity of diesel fuel and lubricating oils, which can accelerate wear in fuel system components and engines.

To address these issues, Argonne National Laboratory (ANL) has developed boron-based additives to improve the lubricity of fuels and lubricants

*More info:* Stephen Lake, 630-252-5685, slake@anl.gov

## NAVY COATING

The Naval Research Laboratory (NRL) has developed a new self-decontaminating coating for use in filters, protective clothing, and disposable wipes that is capable of actively destroying pesticides and related chemical agents on contact. The coating comprises a thin, layered, composite film containing enzymes, which degrade chemical toxins.

It is readily applied to substrates such as beads, fabrics, or paper by inexpensive methods such as dip coating, spin coating or spraying. The materials offer platforms for homeland defense, agricultural, and related applications.

*More info:* www.nrl.navy.mil

## ACCOUSTIC INSPECTION

Pacific Northwest National Laboratory (PNNL) has developed a new spin on an existing acoustic inspection technology. This ultrasonic technology eliminates the need for time-consuming and costly sampling of slurries in large containers. Savings like this are particularly appealing to fermentation-based industries, such as beer and pharmaceuticals.

Through this technology's capabilities, the size and concentration of particles within opaque slurries can be tracked by attaching an acoustic-based technology to the outside of a large tank or vat, much like those used to make beer and medicinal drugs.

PNNL's patented technique is novel in its fusion of information extracted from both acoustic backscatter—referring to the deflection of energy from a sent signal—and transit measurements, including velocity, amplitude and frequency data.

*More info:* www.pnl.gov

## MICRO/NANO MACHINES

Lawrence Berkeley National Laboratory (LBNL) is seeking a qualified partner(s) to work in a collaborative effort to further develop, test, and commercialize improved micro and nano machining technologies to manufacture medical cardiac stents used to shore up weak blood vessels leading to the heart.

LBNL's technology offers the potential to lower stent production costs, improve quality, and provide safer operation.

*More info:* Ka-Ngo Leung, KNLeung@lbl.gov, 510-486-7918

## BUG REPELLANT

Agricultural Research Service (ARS) scientists have isolated a natural compound, callicarpenal, from the American beautyberry that has been shown to repel mosquitoes, ticks, and fire ants. Callicarpenal, an all-natural insect repellent, is an alternative to commercially available synthetic repellents and more effective than currently available natural repellents on the market.

Callicarpenal is as effective as DEET and more effective than picaridin (Bayrepel) in the bioassays used against mosquitoes, and is also as effective as DEET and picaridin against the deer tick. It could be a good alternative to synthetic repellents such as DEET and picaridin, and could be marketed as an all-natural repellent. Callicarpenal is potentially a safer and perhaps more effective insect repellent. The market potential is huge because 38 percent of Americans use a DEET-based product every year.

*More info:* Tara T. Weaver-Missick, twm@ars.usda.gov

## MANAGING ADHD

Attention Deficit Hyperactivity Disorder (ADHD), the most common behavioral disorder in childhood, is estimated to affect three to five percent of people in the United States, both children and adults.

National Institutes of Health inventors Maximilian Muenke, Mauricio Arcos-Burgos, and F. Xavier Castellanos have identified haplotypes of latrophilin 3 (LPHN3) that increase the susceptibility for development of ADHD. LPHN3 is a G-protein coupled receptor that is specifically expressed in the brain's mesolimbic system, which is associated with ADHD.

**Applications:** Identifying individuals with enhanced susceptibility for ADHD; using LPHN3 haplotype information to design individualized treatments.

**Licensing Contact:** Tara Kirby, Ph.D.; 301-435-4426; tarak@mail.nih.gov

## LANL SENSORS

Los Alamos National Laboratory (LANL) scientists are looking for industry partners to develop and commercialize sulfur-resistant, high-temperature, solid-state gas sensors using patented chemically modified terbium-yttrium-zirconium oxide (Tb-YSZ) ceramic coatings. LANL gas sensors can be used to monitor the presence and concentration of O<sub>2</sub>, CO, NO<sub>x</sub>, and hydrocarbon with superior selectivity in most environments, especially in corrosive and high temperature settings.

*More Info:* Michael Erickson, 505-667-8087, michaele@lanl.gov

## STRONGER PLASTIC, RUBBER

Agricultural Research Service (ARS) scientist Lei Jong has discovered a method using defatted soy products to improve the strength of rubber products. Defatted soy products do not contain soybean oil. All of the steps and the equipment for ARS's method are the same as current commercial practices.

However, ARS's method uses defatted soy flour (DSF) in place of carbon black, which is used in automobile tires and other products to increase their mechanical strength.

This invention can be used in various industries such as rubber, plastic, and coatings to significantly improve the strength and biodegradability of a variety of polymer products.

The advantage of using this technology versus other conventional fillers is that defatted soy products give a higher reinforcement effect in rubbers at a comparative or lower cost.

*More info:* Lei Jong, 309-681-6240, jongl@ncaur.usda.gov

*FLC Chair Bids Farewell, from page 5*

ries in transforming federal technology into products for public use. And I know that in the future, we will provide even more information on the impacts and outcomes of these success stories.

Because we are aware that the FLC was organized to serve laboratory technology transfer professionals and their respective agencies and departments, it is imperative that we continually reevaluate and redefine our goals and objectives to ensure that we continue to serve our constituencies as efficiently and effectively as possible. We have undertaken a number of initiatives recently to ensure that this is the case. In 2006, through the hard work of many people involved in the administrative aspects of the FLC, the Consortium promulgated a new Strategic Plan and an accompanying action-oriented Execution Plan designed to measure our progress toward meeting and fulfilling the goals of the Strategic Plan.

In addition, just last month, members of the Executive Board, federal agencies, and representatives of our customer base met for a two-day strategy game, and examined many issues regarding the FLC's current situation and its future role—all for the purpose of better accomplishing the federal technology transfer mission. Strategy game participants examined such critical issues as determining how best the Consortium can continue to serve its members and agencies in a new world economy, what new priorities need to



*FLC Chair Ed Linsenmeyer presents during the 2007 FLC Awards for Excellence in Technology Transfer.*

be established, what new business practices need to be developed, and what new relationships need to be formed. By the time this farewell letter is published, the new Executive Board will be in place and will begin to respond to the results of the strategy game.

I have thoroughly enjoyed my association with the FLC—both as a member and as an officer. I am looking forward to remaining active in the Consortium and continuing to work with you—my friends and colleagues—to further the mission of the FLC and to help realize the goals of federal technology transfer.

My best wishes to all of you.

- Locate Technologies
- Enhance Your T<sup>2</sup> Knowledge
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