

# NEWSLINK

FEDERAL LABORATORY CONSORTIUM FOR TECHNOLOGY TRANSFER

JUNE 2001 VOL. 17, NO. 6

## NASA Challenge Reaps Unique Microsystems at GMI

The challenge came down from NASA: Come up with a program in which industry can work collaboratively with NASA centers and area research organizations, stated **Dan Goldin**, NASA Administrator. Rising to the occasion, **Walter Merrill, Ph.D.**, longtime NASA engineer, proposed the **Glennan Microsystems Initiative (GMI)**—a consortium of government, industry, and university members working together to develop and commercialize microsystems. The consortium's name celebrates the memory of **T. Keith Glennan**, NASA's first administrator.

Now GMI Executive Director, Merrill said, "Our unique focus sets us apart from others doing microsystems work"—developing and commercializing microsystems for harsh environments using silicon carbide (SiC) as a material. Now three years into the initiative, it's thumbs up, and Merrill feels good about the company network of 26 consortium members thus far. Their technical progress shows promise as well—successful prototype demonstrations of chemical sensors that detect emissions in auto engines and prototype pressure sensors



Dr. Walt Merrill, Glennan Microsystems Initiative (middle), shows the silicon carbide (SiC) high temperature electronics display to NASA Glenn Research Center's (left to right) Larry Matus, Microsystems Technology Leader and Mary Zeller, Glennan Microsystems Initiative Program Manager.

tested in a turbine engine environment.

### **Making MUSiC**

The uses for these microsystems could be vast. According to Merrill, "There are a lot of harsh places in the world that could benefit from being monitored"—tough environments with high temperatures in active chemicals. The same platform technologies that work for high-speed car, jet, or rocket engines may also work for process control on a factory floor or deep in a well-drilling environment.

Because of its positive reception and interest, GMI is way ahead of schedule. In a few months, it expects to

establish a not-for-profit incorporated entity that will streamline and improve operations; by 2005 the consortium hopes to have launched four new businesses. GMI's first fledgling company, **Fiberlead, Inc.**, was founded last year to provide consortium members with the multi-user silicon carbide (MUSiC) manufacturing process, which is a method to manufacture microsystems for several different organizations simultaneously.

Modeled after the successful, silicon-based, multi-user MEMS processes (MUMPs), MUSiC enables many companies to

Please see *NASA*, p. 2

## NIST Flat-Panel Measurements Benefit Many Industries

**T**oday we can place our flat-panel TVs flush against the wall and carry small laptops easily in our briefcases. Many of the measurements pivotal to making such convenient, high-tech, flat-panel products work—properties such as contrast ratio, reflection, and colorimetry—were developed by the **National Institute of Standards and Technology (NIST)**.

In conjunction with the video electronics industry, NIST's Electronics and Electrical Engineering Laboratory created an international flat-panel display measurement standard—the basis for how such measurements are made worldwide—that benefits manufacturers, suppliers, and consumers.

The **Mayo Clinic** in Scottsdale, Arizona, used the NIST standard to specify the purchase of 1,000 flat-panel displays for radiological use. This purchase allowed the clinic to switch from printed x-rays to digital images viewed on flat-panel displays, a move that will save the clinic at least \$1.5 million per year.

Aircraft manufacturers such as **Boeing** are also incorporating flat-panel displays into state-of-the-art cockpit designs for safety as well as quality and cost considerations. A display screen that is built to the accepted standard for contrast ratio ensures accuracy for pilots reading critical data. **NL**

For more info: Philip Bulman, 301-975-5661, [philip.bulman@nist.gov](mailto:philip.bulman@nist.gov)



## FED LABS FLASH

*Technology transfer news, notes, and events within the federal lab community*

### **Students May Have Answer for Faster-Healing Civil War Wounds That Glowed**

In May, a team mentored by researchers at the **Agricultural Research Services' Plant Science Institute** in Beltsville, Maryland, placed first at the 2001 Intel International Science and Engineering Science Fair in San Jose, California.

**Jonathan Curtis** and **Bill Martin**, seniors at Bowie High School in Bowie, Maryland, worked with **Phyllis Martin**, an ARS microbiologist and Bill's mother, to show that bacteria that can make insects sick may have been responsible for the exceptional healing of Civil War soldiers' wounds that glowed in the dark.

For their project, "Civil War Wounds That Glowed," the students described how the presence of a luminescent bacteria might have aided healing. They found that three *Photobacterium* strains actually produced antibiotics that inhibited the growth of other bacteria that cause infections in open wounds.

Ms. Martin is seeking to control Colorado potato beetles using *P. luminescens*, a bacteria found in nematodes. The *Heterobacterium* genus of nematodes harbors the glowing bacteria that seem to control the beetle.

For more info: Phyllis Martin, 301-504-6331, [pmartin@asrr.arsusda.gov](mailto:pmartin@asrr.arsusda.gov)

"We've gained a valuable high-tech asset with the addition of Battelle," said Cleveland mayor **Michael White**. "This is a win-win situation for everyone involved."

Battelle's Cleveland office also hosts the **Glennan Microsystems Initiative, Great Lakes Industrial Technology Center, Environmental Technology Commercialization Center, Garrett Morgan Commercialization Initiative**, and the **Technology Partnership Practice**.

### **POSS Micro-Foam Program Triumphs Grow from Original Technology Success**

The **Air Force Research Laboratory (AFRL) Propulsion Directorate** recently initiated a three-year Dual-Use Science and Technology (DUS&T) Program with **Wright Materials Research Co. (WMR)** to

### **Battelle Expands to Cleveland**

In April, **Battelle** opened a new office in Cleveland, providing greater proximity to its client, **NASA Glenn Research Center**.

### **NASA** *from p. 1*

manufacture SiC microsystems while sharing the surface area of the small substrate wafers. Starting with a 4-inch-diameter silicon substrate wafer, the surface is divided into several 1-centimeter square sites, each of which can have hundreds of devices. By sharing similar process steps, each company can manufacture its pressure sensors or accelerometers more efficiently and less expensively.

### **Unique Project in U.S.**

"There's no place in the world today to get SiC microsystems, so we're putting that manufacturing process in place," Merrill stated. GMI has also facilitated one new product development agreement between a major Cleveland company and a smaller member.

The initiative is also investing in *in-vivo* technology—the environment inside the human body is harsh also. Currently, it is working on a catheter-

based drug delivery system for an angioplasty procedure, specifically, a micro-ultrasound imager similar to the technology that checks a fetus in the womb. A microsystem-sized technology located on the end of a catheter would allow 3-D imaging of the artery or vein and define its condition, any blockage, or the amount of plaque buildup. Complementary to that would be a drug-injection device that could pump a drug into the artery wall and keep the arteries open.

Although currently funded by NASA and the state of Ohio, GMI membership is open to any organization in the U.S. Approximately half of the technologies originate at **NASA Glenn Research Center** and **Case Western Reserve University**; other member companies contribute some as well.

### **Call for Industry Support**

GMI's small staff draws on its membership to contribute in kind. An industrial advisory council for industry

members meets twice a year to oversee policy and program plans for the coming year. Technical teams of member representatives review technical progress and keep the projects on track. Much of their industrial interest and participation is generated via a series of breakfast meetings, mostly in the Ohio area, at which all aspects of project development are discussed. Recently, Ohio venture capitalists met with the group to discuss the venture funding of high tech programs. Aware of the encouraging commercialization possibilities, Merrill reports that GMI is becoming much more connected with the "angel" network and venture communities for spinoffs and new startups.

Always seeking additional partners, particularly in the area of market leads and users, GMI's Merrill said, "The Initiative is industrially led. So we look to industry to provide the market presence and the market pull for direction." **NL**

For more info: Walter Merrill, 216-898-6401, [merrill@glennan.org](mailto:merrill@glennan.org)

combine polyhedral oligomeric silsesquioxanes (POSS) polymers with micro- and nanocellular foams. POSS polymers offer significant property enhancements such as improved mechanical and physical properties, while micro- and nanocellular foams increase strength and reduce weight.

In an attempt to meet the Air Force's demand for a new generation of lighter weight, higher performance polymeric materials, the **U.S. Air Force Office of Scientific Research** and the AFRL have, for the past decade, pursued the development of new chemical feedstock technologies based on POSS. Within six years, this investment paid off with the development and large-scale production of the first new polymer feedstocks in the past 40 years. POSS technology is also the only hybrid and nanostructured chemical feedstock technology developed to date. Because its chemical nature allows POSS technology to be easily incorporated into common plastics via

copolymerization or blending, little or no alteration to existing manufacturing processes is required. POSS additives radically upgrade the thermal and physical properties of most plastics.

For more info: Kristin Schario, 937-255-3428, kristen.schario@wpafb.af.mil

### **NTTC to Offer Training Courses**

The **National Technology Transfer Center (NTTC)** is offering two weeks of technology commercialization training in Wheeling, WV. The following courses are being offered: November 5-6, Intellectual Property Negotiation; November 7-8, Licensing Issues for Technology Managers; and November 9, Valuation of Intellectual Property.

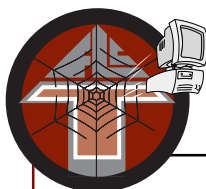
For 10 years the NTTC has provided quality training to more than 4,000 technology professionals at all levels from federal agencies, universities, the private sector, and international organizations.

For more info: Christy Zingo, 800-678-NTTC (6882)

### **LBNL Web Site Helps California Energy Crunch**

Energy efficiency researchers at the **Department of Energy's Lawrence Berkeley National Laboratory (LBNL)** released a new web site, "The 20 Percent Solution," that can help Californians reduce energy use by 20 percent or more. Developed by scientists in LBNL's Environmental Energy Technologies Division, the site identifies energy-efficiency measures and their predicted percentage savings.

To use the site, which can be found at <<http://savepower.lbl.gov>>, residents simply identify their region of California, the size of their house or apartment, and whether or not they have air conditioning. The site then suggests 10 to 20 different ways to save energy this summer. The suggestions are returned in three parts: no-cost measures, low-cost measures, and more expensive measures. **NL**



## Technology Transfer on the World Wide Web

The National Institutes of Health (NIH) Office of Technology Transfer (OTT) <http://ott.od.nih.gov/>

This office evaluates, protects, monitors, and manages the NIH invention portfolio to carry out the mandates of the Federal Technology Transfer Act of 1986. This is largely accomplished through overseeing patent prosecution, negotiating and monitoring licensing agreements, and providing oversight and central policy review of Cooperative Research and Development Agreements. OTT also manages the



patent and licensing activities for the Food and Drug Administration (FDA) and is responsible for the central development and implementation of technology transfer policies for four research components of the Public Health Service — NIH, FDA, Centers for Disease Control and Prevention, and Agency for Healthcare Research and Quality.

University of Utah Technology Transfer Office [www.tto.utah.edu](http://www.tto.utah.edu)

Reporting to the Vice President for Research, the university's Technology Transfer Office (TTO) manages the commercial aspects of technology arising at the university. The TTO helps faculty and staff understand the technology transfer process and comply with its requirements. The TTO creates the appropriate forms and procedures for disclosing inventions and aids inventors in completing this process.

In addition to reviewing invention disclosures and evaluating their legal protectability and



commercial appeal, the office markets the inventive concepts to private industry or licenses the formation of new business entities based on the invention. The TTO also ensures that all obligations to sponsoring entities are met and negotiates the contracts that give commercial rights to private companies. **NL**



## TECHNOLOGY WATCH

Federal laboratory technologies available for technology transfer



### AGRICULTURE

#### ARS Patents New Fruit Fly Lure and Trap

A fruit fly lure and trap that combines chemical and visual stimuli to more effectively control

fruit flies—including the Mediterranean fruit fly, or medfly—has been patented by **Agricultural Research Service (ARS)** scientists in Miami, Florida. The research was led by chemist **Robert Heath** of the **ARS Subtropical Exotic Plant Insect Research Unit, Miami**.

The chemical stimulus in the new trap is derived from three chemicals that have been isolated from food baits: ammonia, putrescine and trimethylamine. These chemicals lure the flies into the trap, where they are retained and induced to feed on a panel that contains a feeding stimulant and toxicant.

The cylindrical shape of the trap provides the visual stimulus by mimicking the three-dimensional look of host fruit. Clear panels at the top and bottom take advantage of the flies' instinctive desire to move toward light, where the lethal sugary

toxicant awaits them.

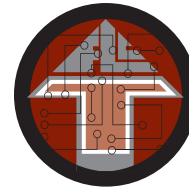
The adult female medfly damages ripe fruit by making a hole and depositing her eggs under the skin. Once the larvae hatch, they begin to satisfy their ravenous appetites by feeding on the pulp inside the fruit, rendering it unfit for human consumption.

The **U.S. Department of Agriculture's Animal and Plant Health Inspection Service** estimates that medfly damage alone would generate agricultural losses of about \$1.5 billion a year if the medfly were to become established in the continental United States.

**For more info:** Robert R. Heath, 305-254-3643, [rheath@saa.ars.usda.gov](mailto:rheath@saa.ars.usda.gov)



The improved version of the McPhail trap uses a combination of three chemicals to attract male and female fruit flies.



### ELECTRONICS

#### "Nanonurses" to possibly help medicine administration

Nanodevices made from biomolecules and tiny nickel propellers could usher in a new generation of ultra-small, robotic medical devices that administer drugs and other treatments from inside the body.

**Office of Naval Research (ONR)**-funded researchers at **Cornell University** report a successful demonstration of these hybrid nanodevices powered by the enzyme adenosine triphosphate (ATP).

"The hybrid nanodevices can be assembled, maintained, and repaired using the physiology of life," said **Carlo Montemagno**, associate professor of biological engineering. However, Montemagno cautioned that before the nanodevices can actually perform their "nanonurse" role inside living organisms, researchers must achieve a higher operational rate.

Nanobiotechnology is a relatively new field of science that merges living systems with nonliving materials at the scale of one-billionth of a meter. Eventually, the Cornell researchers would like to engineer biomolecular motors that are powered by photons rather than ATP. They also plan to add computational and sensing abilities to the nanodevices, which ideally would be able to self-assemble inside human cells. The **U.S. Navy** funds this research for potential application in ultraminiaturized sensors and power sources.

**For more info:** Diane Banegas, 703-696-2868, [banegas@onr.navy.mil](mailto:banegas@onr.navy.mil)



### BIOTECHNOLOGY

#### Rebuilding Bone with the Help of Technology

The combination of tissue engineering (providing replacement tissue in the form of a

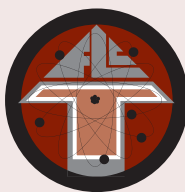
biomaterial for a damaged area) with materials science holds the promise of producing biomaterials capable of regenerating bone that has been broken or lost to disease. Researchers at the **Paffenbarger Research Center** in Gaithersburg, Maryland, a collaboration between the **American Dental Association (ADA) Health Foundation** and the **National Institute of Standards and Technology (NIST)**, are working to expand the use of bone repair material—primarily calcium phosphate cement—beyond what is currently possible.

Originally developed as a dental material, calcium phosphate cement has been commercialized for use in neurosurgical applications as well. For example, physicians can use it to rebuild

facial parts lost to cancer. The cement, which the body readily accepts, replaces a section of bone and serves as the scaffolding on which new bone forms in the same shape. Use of this biomaterial is now limited to body areas that do not move or bear any stress.

The ADA/NIST team hopes to expand these limited capabilities by modifying existing biomaterials and developing new ones. The goal is to produce materials that can handle the physical demands on bone where movement and stress are factors. As a result, dental implants—which now require a lengthy procedure from placement to actual use—could be completed in days rather than months. In another example, bone cement injected in fluid form into a broken arm, knee, or hip could reduce mending time.

**For more info:** Pamela Houghtaling, 301-975-5745



## ENERGY

### System Helps to Prevent Power Grid Failures

A system developed using technology from the **Department of Energy's Pacific Northwest National Laboratory (PNNL)** and the **Bonneville Power Administration** soon will provide key information to California power providers that are challenged by increased loads and decreased supply.

The Wide Area Measurement System (WAMS) continuously monitors grid performance across the Western power system and provides operators with high-quality data and analysis tools to detect impending grid emergencies or to mitigate grid outages.

The WAMS technology performs two major functions: obtaining data and extracting value from them. Data are obtained through customized data recording hardware that produce high-quality and high-volume recordings that are virtually continuous.

Inputs to these monitors are generally taken from preexisting analog sources, in which the electrical utilities have a vast investment. An emerging monitor within the WAMS technology is a new digital system whereby signal inputs stream continuously from remotely located sensors to measure the relative phase angle, precisely synchronized against the satellite-based global positioning system (GPS).

Extracting value from these measured data is a critical element of WAMS. Data are extracted and analyzed using several signal analysis tools and algorithms, including tools for interactive batch processing of response data from power system monitors or simulation programs, filtering options, several kinds of advanced signal analysis routines, and graphical user interfaces (GUI).

**For more info:** PNNL Media Relations, 509-375-3776



## CHEMICAL ENGINEERING

### Asian Longhorned Beetle Pheromone Developed

A new chemical attractant and lure created by **USDA Agricultural Research Service** scientists may help combat the pesky Asian longhorned



The Asian longhorned beetle, shown on a cross-section of a tree it has damaged, creates large holes that inhibit the vascular system and ultimately kill the tree.

beetle—*Anoplophora glabripennis* (ALB)—an invasive species that has destroyed hardwood trees in Chicago and Brooklyn neighborhoods.

The invention relates to compositions and methods for attracting, trapping and/or killing the adult ALBs, or for interfering with their reproduction. The Asian longhorned beetle is a member of the largest and one of the most advanced subfamilies, the Lamiinae, whose species usually attack living trees. In combination with a trap or toxicant, the aggregation pheromones—4-(n-heptyloxy) butanal and 4-(n-heptyloxy) butan-1-one—provide the means for monitoring, killing, or inhibiting the reproduction of the insects.

If the ALB spreads unchecked into U.S. urban and forest landscapes, it could cause billions of dollars in damage to ornamental and forest trees, as well as the maple syrup, lumber and tourism industries. So far, the only solution has been to cut down and remove infested trees.

**For more info:** Mary Ann Gwozdz, 301-504-5345, mag@ars.uda.gov



## ENVIRONMENT

### ONR Sensors Protect Endangered Manatees

The U.S. Navy is helping to save Florida's giant manatees. With the manatee population dwindling (about 2,000 today) from disease, pollution, and boat and underwater accidents, these animals can now avoid being crushed in underwater canal gates and locks with sensors. Originally developed by the **Office of Naval Research (ONR)** for underwater mine detection, a system of acoustic sensors placed on Port Canaveral gates and locks operates like garage doors and stay open if a manatee is nearby. Sensing the manatee's presence in 1/10 of one second, the locks with sensors close once the creature is out of range. Since the site was outfitted with the sensor system in March 2000, no manatees have been killed in any gate closings.

With ONR's acoustic sensors, the **Harbor Branch Oceanographic Institution** in Fort Pierce, Florida, developed a non-contact acoustic detection system that uses a ladder of sound beams between the two gates. The edge of one gate is fitted with a series of sound emitters placed at 20-centimeter intervals, and receivers on the gate detect the generated signals. If a manatee is between the closing gates, the sensors detect it, activate audio and visual alarms, and open the gates.

**For more info:** Gail Cleere, 703-696-4987; cleereg@onr.navy.mil



## SPOTLIGHT ON SUCCESS

*Success stories from the federal lab community*

### ORNL, Motorola Labs, PNNL Seek Vital Semiconductor Materials

**I**n the semiconductor industry, smaller, faster, and better are still the key words for future electronic products—thanks possibly to a Cooperative Research and Development Agreement (CRADA) between **Oak Ridge National Laboratory (ORNL)**, **Motorola Labs**, and **Pacific Northwest National Laboratory (PNNL)**. This **Department of Energy**-funded basic science research could, in fact, have a significant impact on this major industry.

Pursuing new materials together, the partnership aims to increase the speed of future generations of integrated circuits and overcome a fundamental physics problem that threatens to limit future semiconductor improvements. For decades, the semiconductor industry has been able to increase the amount of circuitry, or computing power, on a chip while reducing its size. However, additional size reduction may no longer be possible because of the current gate insulating material, a layer of silicon dioxide, which must be proportionally thinned each time the chip is reduced in size. With the current pace of chip progression, silicon dioxide can no longer provide the necessary effective insulation.

Industry experts predict the need for new materials with higher dielectric constants (high k-materials) that allow the necessary thickness for insulation. Both ORNL and Motorola Labs have been developing such materials in the

form of crystalline oxides on silicon and other semiconductor materials.

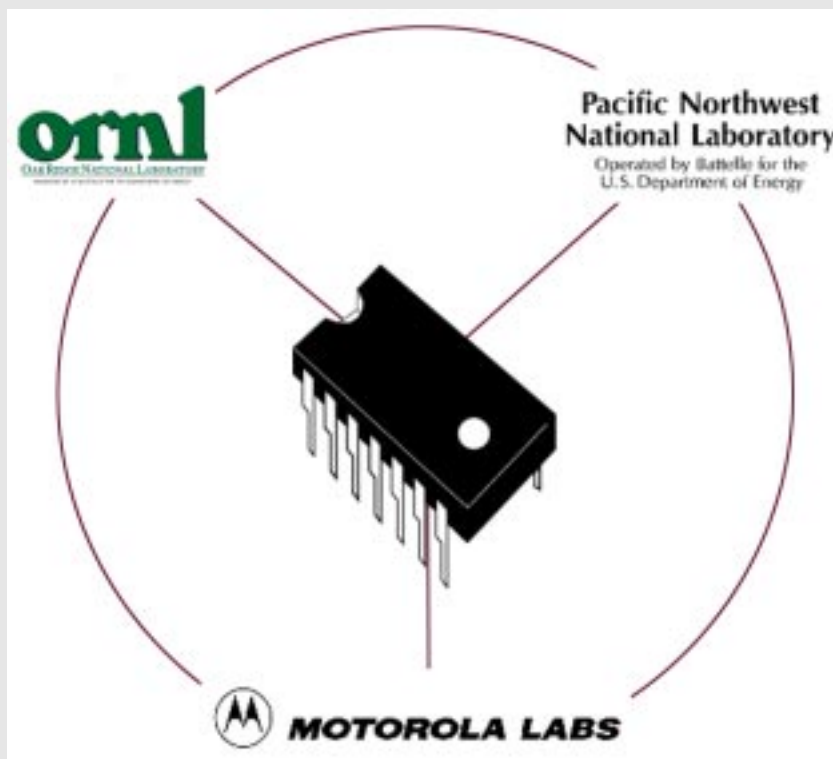
“By using crystalline oxides, we’re able to eliminate one of the hurdles to continuing the current rate of growth in the semiconductor industry,” said **Rodney McKee** of ORNL’s Metals and Ceramics Division.

Motorola Labs also has been researching high-k materials for several years and, in 1999, demonstrated the world’s thinnest functional transistor with electrical properties that are more than 10 times better than equivalent silicon dioxide. The scientists hope that combining their individual progress and expertise will enable them to solve more quickly the remaining issues for the benefit of the entire U.S. semiconductor industry.

The three-year CRADA has two phases: to address transferring the details of ORNL’s patented crystalline oxide on silicon process to Motorola Labs and

PNNL, and to test and optimize the technology to ensure that critical performance and processing issues are met. Motorola Labs has been working with PNNL to evaluate the samples grown at Motorola. These tested technologies may possibly be tailored and implemented for Motorola’s specific needs. **NL**

For more info: [www.ornl.gov/news](http://www.ornl.gov/news);  
[www.motorola.com](http://www.motorola.com); [www.pnl.gov/news](http://www.pnl.gov/news)



## Finding What You Want

Need help finding a technology or facility at a federal lab? In addition to *NewsLink*, the FLC also offers this free service to help you navigate the federal lab system.

### Laboratory Locator

Our Laboratory Locator personnel will search the FLC network for the exact technology or facility you are seeking. All you have to do is submit a Technical Request Form describing what you need. To do this, go to [www.federallabs.org](http://www.federallabs.org) and click on LABORATORY LOCATOR or call 856-667-7727 and ask for Frank Koos or Rick Christ.



## SENSORS

### Real-Time Locator Does More Than Just See in the Dark

Westinghouse Savannah River Company (WSRC) researchers have developed the dead reckoning pedometer (DRP) system to monitor movement or determine the location of a person in confined spaces.

The DRP system measures, records, and enables a person's location within an enclosure to be monitored when visible reference points are limited or nonexistent.

The system shows wearers, in real time, where they are and the path they took to get there from the structure's entry point. For example, the displayed path could be used by firefighters inside a burning building to easily retrace their steps to exit the building.

The system comprises a sensing package, local data receiver/display unit, transmitter, and remote base station. Using small magnets and magnetometer sensors that are attached to the person's shoes, the system sends location information to the local data receiver for immediate display. The location is displayed on a simple liquid crystal screen that can be mounted on a belt or helmet visor.

Location and path information can also be transmitted to the remote base station so persons outside the structure can monitor and direct persons inside. Both the local and the remote path displays can be overlaid on blueprints, architectural drawings, or three-dimensional drawings.

The remote base station can also integrate data received from other sensors carried by the person in the structure or independently mounted in the structure.

WSRC is seeking companies interested in licensing this device for the purpose of manufacturing and selling it as a commercial product.

**For more info:** Dale K. Haas, 803-725-4185 or 800-228-4988, dale.haas@srs.gov



## LAW ENFORCEMENT

### Lengthening the Arm of the Law with Biochip Technology

The use of biochips to make DNA-typing an even more effective crime-fighting tool is the focus of cooperative work between **Illinois State Police Department** forensics experts and **Argonne National Laboratory (ANL)** researchers.

ANL's biochip technology offers the prospect of faster DNA analysis, even with samples that are difficult to handle.

"This is the next step in DNA technology," said **Barbara Llewellyn**, assistant director of the police department's research and development laboratory in Springfield, Illinois, and a visiting scientist at ANL. "Using biochips, we hope to provide more tests in less time."

Specially designed biochips contain specific probes for mitochondrial DNA (MtDNA), which directs protein synthesis in the body and is inherited maternally. MtDNA was used, among other things, to identify the skeletons of Czar Nicholas II, the last Russian monarch, and his family.

Researchers have been working over the past year to develop an MtDNA biochip. Llewellyn expects that the test will be available for casework in 2 ½ to 3 years.

MtDNA also addresses one shortfall of short tandem repeat (STR) DNA typing, the method now generally in forensic use: STR DNA is not useful for degraded samples or for hair strands that do not include roots, while MtDNA typing can work in both situations.

**For more info:** Larry Hill (ANL), 630-252-7268; Barbara Llewellyn (Illinois State Police Department), 217-557-2399, barbara\_llewellyn@isp.state.il.us



Biochip researcher Julie Lebed (foreground) works with Barbara Llewellyn, assistant director of the Illinois State Police research and development lab.



## TRANSPORTATION

### AFRL Sensors Monitor Air Traffic

Laser-based traffic monitoring technology developed by **Air Force Research Laboratory (AFRL)** engineers will offer state and federal highway authorities a new, inexpensive way to analyze roadway usage—while increasing safety for both motorists and highway maintenance personnel.

The Multi-Lane Traffic Monitoring Sensor (MTMS), developed by the **AFRL Information Directorate's Information Systems Division at Wright-Patterson Air Force Base, Ohio**, is a low-cost, nonintrusive lane-monitoring sensor. The system was developed to eliminate roadway installation safety concerns by measuring and classifying vehicular traffic over multiple-lane roadways.

"This sensor permits portable or permanent set-up along a roadway without costly construction, maintenance, traffic disruptions or hazardous situations for highway personnel," said **Stephen L. Benning**, program manager. With expandable capabilities, it also meets advanced requirements for the Federal Highway Administration and the Ohio Department of Transportation (ODOT).

Current U.S. traffic monitoring systems consist of inductive loops, piezo-electric switches, and road tube sensors to monitor traffic flow. Ohio has installed this current technology at 5,000 sites to collect and record traffic counts, classify vehicle types, and gather speed data. If permanent installations are not included when the highway is built, the sensors must then be installed later at a much greater expense. When major road repairs are made at a permanent installation site, the monitoring sensors must also be replaced at additional cost. ODOT requested a low-cost, nonintrusive traffic-monitoring sensor that is safe to install.

The MTMS was designed and developed using existing aerospace technologies. It uses dual-beam lasers to detect vehicles under various highway conditions, and the signals are then processed and stored for later traffic analysis. **NL**

**For more info:** Francis L. Crumb, 315-330-3053, crumbf@rl.af.mil

950 North Kings Highway  
Suite 208  
Cherry Hill, NJ 08034

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## COMING ATTRACTIONS

August 7-9, 2001

**MobileEXPO Utility Forum East**  
King of Prussia, PA

MobileEXPO's Utility Forums are all-inclusive, mobile-focused events for the utility industry. This event builds on the unique educational content of MobileVillage's 1995-2000 Utility Industry Mobile Computing Forums.

[www.mobileexpo.com](http://www.mobileexpo.com)

August 13-15, 2001

**2nd Annual Naval-Industry R&D Partnership Conference**  
Washington, D.C.

The conference, Breaking Through the Barriers to Technology Insertions, will provide opportunities to better understand naval technology needs and business opportunities, as well as industry's methods of exploiting and marketing technology. The format includes a combination of keynote speeches, highly interactive panel sessions, solution-focused breakout sessions, business-to-business/government marketplace and exhibits.

Nancy Groves, 703-696-5991,  
[www.naval-industrypartnerships.com](http://www.naval-industrypartnerships.com)

August 13-17, 2001

**IBC's 6th Annual World Congress Drug Discovery Technology 2001**  
Boston, MA

One of the largest annual gatherings and networking events for pharmaceutical and biotechnology drug discovery researchers and executives worldwide. Projected attendance of more than 4,000 people and 300 exhibit booths.

[www.drugdisc.com](http://www.drugdisc.com)

September 10-13, 2001

**Instrumental, Systems and Automation Conference and Exhibition (ISA)**  
Houston, TX

More than 30,000 visitors are expected to attend this exhibition on industrial measurement and control events. The technical conference is included at no extra cost.

Carol Schafer, 919-549-8411,  
[info@isa.org](mailto:info@isa.org)

September 19-21, 2001

**Total Technology Expo/Denver**  
Denver, CO

This expo, which launches the computer industry into the next millennium, consists of a transformation of how we do business in relation to networking, computing, Internet, intranet, e-commerce, videoconferencing, telecommunications, multimedia, desktop publishing and more.

[www.totaltechnologyexpos.com](http://www.totaltechnologyexpos.com)

October 24-26, 2001

**2001 Environmental Technology Conference**  
Atlanta, GA

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