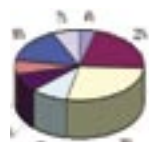


T<sup>2</sup> I N S I D E



Army  
CRREL'S  
Greenhouse,  
page 2

Navy  
Newport  
Sensor,  
page 3



Resourceful  
FLC T<sup>2</sup>  
Training,  
page 6



T<sup>2</sup> S U R V E Y

What is the most important  
element of your T<sup>2</sup> program?

- Developmental partnerships
- Patents and licensing
- Facility usage
- Other: \_\_\_\_\_

Respond to [tgrayson@utrs.com](mailto:tgrayson@utrs.com).  
Results to be posted in the next  
issue of FLC NewsLink and at  
[www.federallabs.org](http://www.federallabs.org).



T<sup>2</sup> F A C T

In 1921, University of  
California medical stu-  
dent John Larson invented  
the modern lie detector.  
Because the machine is  
designed to detect lies by  
simultaneously measur-  
ing varying body reac-  
tions when telling a lie,  
including blood pressure,  
heart rate, and breathing  
patterns, it is commonly  
known as a polygraph.



T<sup>2</sup> E V E N T S

- The Hows and Whys of  
Funding Your Technology  
Newport, RI  
Oct. 13-14, 2004
- 
- State Science & Technology  
Institute Conference  
Philadelphia, Pa.  
Oct. 14-15, 2004
- 
- ONSET Ventures Conference  
San Francisco, Calif.  
Oct. 21-22, 2004
- 
- Annual Iberoamerican Research  
& Development Summit  
Albuquerque, N.M.  
Nov. 9-11, 2004
- 
- World's Best  
Technologies 2005  
Arlington, Texas  
March 28-30, 2005

## Oak Ridge Leads Sensors and Electronics Possibilities

by James Hardy, Oak Ridge National Laboratory

**Oak Ridge National Laboratory** (ORNL) is a Department of Energy (DOE) national resource managed by the University of Tennessee/Battelle LLC.

ORNL is the largest multi-program national laboratory, which has resulted in significant diverse and multidisciplinary sensor and electronic capabilities.

Over 200 professionals are engaged in measurement science R&D in the areas of new transduction methods, advanced micro/nano electronics, innovative signal and image processing, new materials for harsh environments, and wireless sensors and networks. Some of the impact of this R&D includes over 50 R&D 100 awards, 25 FLC Excellence in Technology Transfer awards (6 national winners), and the creation of more than 20 companies.

A typical technology transfer path is R&D to a prototype to a commercialization partner. Methods to follow this path include passive techniques of publishing and presentation of the R&D to patents and advertising licensing opportunities to more interactive techniques such as Cooperative



Venu Varma of ORNL is shown with a micro-robot, a battery-powered sensor that can travel under doors, for example, and detect chemical and biological agents.

Research and Development Agreements (CRADAs) and highly interactive methods of personnel assignments between industry and laboratories.

ORNL recently embarked on a new commercialization model that involves developing intellectual portfolios (IPs) in

a few select areas and, when appropriate, serving as the R&D arm for companies to rapidly transfer technology and develop working prototypes.

While this new model appears to be working well, it still has some risks and barriers to overcome. Some of the risks are the company may fail and ORNL employees may leave to join the company. Barriers include different business cultures and goals like R&D versus

product development, product marketing savvy, design for manufacturing, and the value of the IP.

Going into a partnership with the view of a long-term relationship mitigates some of these issues and barriers.

See Oak Ridge, page 4

## Naval Lab Licenses Probe to Austin AI, LLC

by Chandra Morris, MSU TechLink

What probe functions like a Star Trek tricorder, can be pushed 100 feet deep in the soil, and has the potential to revolutionize mineral exploration, soil contaminant characterization, and petrochemical and chemical processing here on Earth? Give up? It's called a CP-1000 x-ray fluorescence (XRF) cone penetrometer, and it's just been licensed from the U.S. Navy for commercial development by Austin AI, LLC of Austin, Texas.



John Schindler, Vice President of R&D for Austin AI, stands with the CP-1000 XRF cone penetrometer in a lab stand configuration.

phorus," said **Tim Elam**, the Navy inventor, now at the Applied Physics Laboratory of the University of Washington. "This is tomorrow's probe today," said

"With this technology you can identify and measure heavy metals - and for that matter any element heavier than calcium - and we are working on lighter elements like potassium and phosphorus," said **Tim Elam**, the Navy inventor, now at the Applied Physics Laboratory of the University of Washington. "This is tomorrow's probe today," said

Rick Comtois, president of Austin AI. "The CP-1000 is going to accelerate the shift in industry demand from laboratory to on site, or in situ, soil characterization."

Researchers at the **Naval Research Laboratory** (NRL), Washington, D.C., originally developed the technology to detect metals in soil and to provide quantitative information on their concentration. Today, commercial applications are being developed by Austin AI, while the University of Washington and NASA are developing applications for the Mars Rover.

The CP-1000 works by emitting into the soil low levels of energy that reflect the presence and concentration of soil elements such as micronutrients for plants and precious metals in complex backgrounds. Promising applications include

See Navy Probe to Austin, page 4

## DC on T<sup>2</sup> OMB Offers Area of Focus for Federal Research

by Neil MacDonald  
Federal Technology Watch

Homeland security R&D; networking and information technology R&D; the National Nanotechnology Initiative (NNI); priorities of the physical sciences; biology of complex systems; and climate, water and hydrogen R&D are identified as "interagency R&D efforts that should receive special focus in agency budget requests" for FY2006 in a joint White House Office of Management & Budget (OMB) and Office of S&T Policy (OSTP) memo dated August 12.

Several other R&D activities are also characterized as important, but are mostly ones "within the purview of a single agency," such as NASA's new vision for space exploration and NIH research to improve health.

See DC on T<sup>2</sup>, page 5

## ARS Shields Agriculture

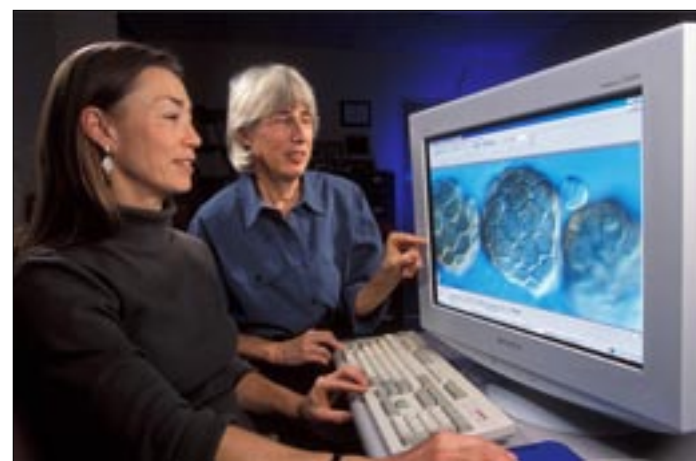
by Eric Peabody, Agricultural Research Service

They may study simple plants, but some fungi experts are part of a complicated mission—shielding American agriculture from harmful pests.

Agricultural materials—crops, plants, plant products, and nursery stock—that arrive at U.S. ports must be examined for nonnative, potentially invasive pests such as fungi, especially those of quarantine significance. Tasked with scanning myriad agricultural products for fungal diseases, port identifiers are sometimes stumped by a particularly enigmatic specimen.

That's when they call in the experts—mycologists who work for the **Agricultural Research Service** (ARS) and USDA's Animal and Plant Health Inspection Service (APHIS).

Mary E. Palm, APHIS's national mycologist, is first on the list to identify fungi that are intercepted during inspection at U.S. ports. Based at ARS's **Systematic Botany**



Mycologists Mary Palm (left) and Amy Rossman discuss the identification of a rust fungus.

See ARS Shields Agricultural, page 4

# Fed Labs Flash

Technology Transfer Notes

## PNNL Researchers Join HPS

Don Bihl and Bruce Napier, researchers at the Department of Energy's **Pacific Northwest National Laboratory**, recently were named fellows of the Health Physics Society (HPS). The honorees were recognized in July at the HPS annual meeting in Washington, D.C., for their outstanding contributions to health physics.

Bihl operated the internal dosimetry program at DOE's Hanford Site in Washington between 1989 and 2002. The program included performing internal radionuclide dose evaluations for thousands of staff on the site. Bihl further managed the external dosimetry program for two other DOE sites. He presently consults for those two programs and works on the National Institute for Occupational Safety and Health dose reconstruction project. Bihl has published more than 20 reports and publications.

Napier develops and operates models that show the environmental transport of radiological and chemical containments. His expertise is in the areas of radiation dose reconstruction, computer modeling and environmental analysis. He is currently the principal investigator for a dose reconstruction project that examines populations living along the Techa River, downstream of the Russian Mayak Production Association. He has written more than 40 publications.

## EPA CRADA with Affymetrix

by Neil MacDonald, *Federal Technology Watch*

The Environmental Protection Agency (EPA) has signed a Cooperative Research and Development Agreement (CRADA) with Affymetrix, Inc. to develop test protocols to protect humans from the effects of toxic chemicals.

Under this arrangement, the feasibility of using Affymetrix's GeneChip technology to predict chemical toxicity in humans will be assessed by the EPA at its **National Health & Environmental Effects Research Laboratory** in Re-

search Triangle Park, N.C. Affymetrix technology could offer a faster, less expensive and more accurate way to screen such reactions than is possible using current laboratory animal testing.

"Since such testing can be both time- and cost-intensive, we see great potential in being able to use chip technology to more efficiently and effectively select chemicals for toxicological evaluation," EPA Assistant Administrator for R&D Paul Gilman said.

Using GeneChip technology could improve the agency's ability to "prioritize chemicals for screening and testing for human health hazards," he added.

## Army CRELL's Greenhouse



search Triangle Park, N.C. Affymetrix technology could offer a faster, less expensive and more accurate way to screen such reactions than is possible using current laboratory animal testing.

The U.S. Army's Engineer Research and Development Center's Cold Regions Research and Engineering Laboratory (CRREL) is building a new greenhouse at its Hanover, N.H. location. The 2,700-square-foot facility features a computerized root-imaging system, photosynthetic fluorescent/gas exchange system, and a temperature-controlled seed storage room. The \$600,000 building will be used for germination and root-growth studies in support of basic and field research, including revegetation and phytoremediation. Completion is scheduled for late fall.

## LANL Lineup Changes

by Kathy DeLucas, *LANL*

Scott Gibbs is the new acting associate director for operations at Los Alamos National Laboratory (LANL).

Gibbs joined LANL in 1985 as a technical staff member in Materials Technology: Metallurgy and

has held various positions since, including program manager for uranium processing and storage, scientific and technical advisor for Nuclear Materials and Stockpile Management Programs, program director for Materials and Manufacturing in the Nuclear Weapons Program, and deputy associate director for operations.

Gibbs became Security and Safeguards Division leader in January 2003.

"I'm looking forward to this challenge and the opportunities it presents," Gibbs said. "The Operations Directorate has enjoyed many successes and progressed rapidly under Jim Holt's direction, and I hope to continue that momentum."

Holt, associate director for operations, has accepted a new job at Lawrence Livermore National Laboratory. Holt's career at LANL has encompassed a range of activities from research and development in support of the nuclear weapons program, including nuclear testing at the Nevada Test Site, as well as assignments in Washington, D.C.

"I have made a very difficult career decision to leave Los Alamos based on a number of factors, some personal and some professional, but I have decided the move was best for me at this stage of my career," Holt said. "My time at Los Alamos has been both challenging and exciting, and I have enjoyed every assignment."

Assuming the day-to-day operation of S Division is John E. "Jack" Killeen, who will be acting division leader. Killeen has most recently served as the general manager of the Department of Energy's National Training Center.

Before going to the Training Center, Killeen was general manager of Protection Technology Los Alamos, the Lab's protective force subcontract company.



## TVC Provides Inventors with Business Savvy

by Tom Anyos, *Technology Venture Corporation*

Having a "great idea" is never enough for government-funded technology to make its way successfully into the commercial marketplace.

A number of factors are required, not the least of which are a strong business case and a passionate and committed entrepreneur behind it.

Once a technology is identified as having commercial promise, Technology Ventures Corporation (TVC) works closely with the inventors, who may not necessarily possess business experience.

TVC helps the inventors or entrepreneurs develop business cases that are identified as technologies with commercial potential, assists in the analysis of market research, provides extensive workshops in entrepreneurial training, helps to recruit managers and other executive employees for startup companies through its job web site, assesses growth and market penetration strategies, provides advisors and coaches to refine business plans and presentations, works with entrepreneurs as mentor and coach in solving business problems and challenges and, finally, introduces entrepreneurs to private equity capital resources.

TVC does all this without charging fees or taking equity as the company is essentially wholly funded by Lockheed Martin and the National Nuclear Security Administration (NNSA).

Guiding technology derived from government-funded research and development is the key to the process. TVC's experience, expertise and experienced staff make it possible to bridge the chasm between raw defense technology and the marketplace.

When Lockheed Martin founded Technology Ventures Corporation in 1993 as part of its successful proposal to manage the Department of En-

ergy's Sandia National Laboratories, the challenge was clear: facilitate the commercialization of technologies developed in national laboratories and research universities to create thriving companies and good jobs.

In pursuing these goals, TVC's relationships with the NNSA's laboratories (Los Alamos National Laboratory, Sandia National Laboratories, Lawrence Livermore National Laboratory), the Nevada Test Site, and the NNSA site offices are vital to its mission of commercializing government-sponsored technology.

America's extensive investment in research and development has created a wealth of technologies resident in our national laboratories with potentially broad applications in the private sector. Commercializing these technologies by creating new business enterprises provides an enhanced return on that investment by advancing our nation's ability to compete in the technology business world of today and tomorrow.

### The TVC Model

Each year TVC receives over 300 inquiries from individuals and companies looking for assistance. TVC works only with technology-based entities. In the initial contact, a project manager will seek information about a proposed product to see if a credible business case exists.

The manager will want to know about the entrepreneur's background and his or her interest in developing an effective business plan. The applicant will then be listed as an "opportunity" in the TVC log and will start working with a TVC project manager.

TVC project managers then work with the entrepreneurs to develop a solid business plan, which may take eight months or more. The plan is reviewed

See TVC, page 6



TECHNOLOGY VENTURES CORPORATION  
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## FLC NEWSLINK

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# Tech Watch: Laboratory Techs Ready for Transfer

## KCP's Innovative Laser Housing

The National Nuclear Security Administration's **Kansas City Plant** has applied a new process that is more efficient—saving time, materials, and money—and can apply additional applications to laser housing.

Traditional methods of building a laser involve mounting optics onto individual optical mounts and screwing those mounts into a housing (a hollowed out block of stainless steel, for example).

The Kansas City Plant's new laser housing invention (patent pending 10/302,266) eliminates the need for expensive optical mounts by not machining certain areas of the block of stainless steel.

These "unmachined" areas become the optical mounts.

This method cuts much of the formerly necessary – but very complex and expensive – parts out of the assembly.

It also reduces the amount and required precision of machining to the housing, further reducing the cost of the assembly.

Since all of the optical mounts are already positioned with extreme precision inside the housing, the complex and time-consuming task of aligning the laser is dramatically reduced.

The new laser housing, which was originally conceived for weapons systems, also holds promise for some commercial applications.

Commercial solid-state lasers can be complex, temperamental, expensive, and high-maintenance.

The new laser housing allows for a rugged, small, maintenance-free laser to be cost-effective for use in materials processing, medical, or other laser technology applications.

This design has clear benefits for current applications using high-powered lasers, and also for applications that haven't used lasers, such as conventional ordnance initiation and engine ignition.

For more information about the integrated mount laser or to learn how the Kansas City Plant can help you implement technology solutions, please contact the business development office at 800-225-8829 or visit <www.kcp.com>.

## Tracking Wrong Moves

Developed by researchers at the **Westinghouse Savannah River Company**, LapPoint is a software application that tracks unauthorized moves of portable computer equipment, recovers lost or stolen computers, and reports unsanitized hard drives.

LapPoint is installed on the computer and is started as a background application from a registry entry when a user logs in (or bypasses the log-in process). Once the computer connects to the web server, the server either recognizes the computer as residing at a valid address (on the corporate intranet domain or at a corporate dial-in address), or the server requests more information from LapPoint.

### Benefits

If a computer running LapPoint is lost or stolen and then used to attach to the Internet through a dial-in or an Ethernet connection, LapPoint transmits the current location.

The IP address and configuration information will provide enough location data to track and recover the computer.

This same functionality exists for computers misappropriated or moved within the corporate intranet - current location reporting is available.

LapPoint is very beneficial where it is standard practice to sanitize the hard drives of computers returned at the end of their lease.

If these computers, including desktop computers, are running LapPoint and the hard drive is not sanitized, if the computer is connected to the Internet after return from lease, LapPoint will report the current location data.

This process can further reduce the risk of public release of sensitive data.

### Potential Applications

LapPoint is an asset management tool for all companies that want to recover stolen computers, track unauthorized moves of equipment and maintain an inventory of hard drives that have not been properly sanitized prior to dispositioning.

*More info:* John Olschon, License Specialist, 803-725-8125 or 800-228-3843, john.olschon@srs.gov.

## NAVSEA Newport Sensor

Engineers at the **NAVSEA Naval Undersea Warfare Center Division Newport**, Rhode Island, have successfully adapted fiber optic sensor technology, originally developed for the detection of enemy submarines, to detect and locate intruders into secured areas.

Exploiting Rayleigh optical scattering, a buried single-mode communication optical fiber is able to sense sound pressure waves emanating from people and vehicles moving near or over the buried fiber.

The fiber optic sensor is inexpensive and easy to deploy. Associated signal processing allows the operator to adjust the size of the detection zones to localize an intrusion.

Long perimeters or borders up to 15 kilometers in length can be secured with a single set of electronics.

Applications for this technology include security protection of buildings, airports, borders and infrastructure.

The fiber optic perimeter security system can be integrated with other installed security systems such as video cameras, infrared motion detectors, microwave detectors and radars.

*More info:* Dr. Theresa A. Baus, Technology Transfer Manager, 401-832-8728, or BausTA@npt.nuwc.navy.mil



## Proven to Work

### LANL's Method for Detecting Use of the Mass-Hamilton X-07

The internationally recognized Vulnerability Assessment Team at **Los Alamos National Laboratory** (LANL) has developed a number of advanced security seal/tamper indicating technologies that are available for further development and licensing.

One example is the method for detecting the use of the Mass-Hamilton X-07 and other electronic safe locks.

Hundreds of thousands of electronic locks such as the Mass-Hamilton X-07 are used for securing a variety of very high-value items, including national security documents, corporate secrets, and jewelry.

One of the features of these locks is that the dial indicators are LCD displays rather than marks on the dials, as with traditional combination locks.

While this helps prevent unauthorized opening of the lock, it does not easily indicate if unauthorized tampering or opening of the lock has occurred.

LANL has developed a method for detecting if even slight changes to the lock dial position have been made, indicating if an unauthorized attempt at opening has been made.

### Benefits

- Extremely high sensitivity
- No indication to the intruder that tampering has been detected
- Very difficult to defeat even when the intruder knows the tamper detection method
- Very low incidence of false tamper indications
- No modifications to the lock mechanism are necessary.

If your company is a leader in the cargo security field, these inventions may be of special interest to you.

LANL's Vulnerability Assessment Team, headed by **Roger Johnston**, has tested and defeated over 200 commercially available security seals.

Based on this vast knowledge of currently available seals, they have ongoing projects to develop new and improved, state-of-the-art technologies for a variety of security applications.

We will be happy to provide you with more infor-

mation upon request or to set up a demonstration by Dr. Johnston's team.

*More info:* Brooke Kent, Los Alamos National Laboratory Public Affairs Office, 505-665-9179, brooke@lanl.gov.



*Bridging Technology Through Innovation Exchange*

Albuquerque, New Mexico  
November 9-11, 2004

The **Annual Iberoamerican Research and Development Summit** is a unique opportunity for companies, investors, laboratories, centers of excellence, universities, and international organizations to meet in a centralized location to explore partnership opportunities and prospects for international business development. AIRDS 2004 will focus on the biosciences, with an emphasis on measurement and enumeration tools. The bioscience community is searching for better, more efficient, and cheaper tools that bring new levels of clarity to the understanding of biological events. AIRDS 2004 will be the event where these two worlds collide—Measurement Science meets Bioscience.

*More info:* visit [www.irdsummit.org](http://www.irdsummit.org) or contact **Vic Chavez** at 505-844-4220

# FLC 2005

Federal Laboratory Consortium for Technology Transfer  
Orlando, Florida May 1-6, 2005



Mission Driven Partnerships  
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## FLC Technology Locator Personalized 1:1 Assistance!



*Need assistance locating information on federal technologies, federal laboratory expertise, or collaboration possibilities? Then contact the FLC's Technology Locator for personalized 1:1 assistance!*

*Call Sam Samuelian  
856-667-7727*

Oak Ridge, from page 1

Two of ORNL's portfolio areas are microsensors, and wireless sensors and networks. Each technology area has over 20 patents and new inventions in the works. Recent successes include the lab-on-a-chip technology, in which ORNL has incorporated almost all of the technology transfer techniques in this arena. ORNL has published, licensed, completed a CRADA, the lead inventor took entrepreneurial leave to work directly with Caliper, and now Caliper is selling products based on ORNL discoveries.

An example that provides an interesting case study is with the MEMS microcantilever (MC) technology. MCs were invented at ORNL in 1992, and laboratory demonstration as chemical sensors occurred in 1995. Significant internal R&D funds developed capacitive arrays and telemetry in 1997. In 1999, a CRADA was formed with Graviton to jointly develop readout and wireless telemetry electronics. A leading scientist took entrepreneurial leave from 2000 to 2002. In early 2003 the startup folded and a new company, Seacoast Sciences, formed as a spinoff, initially is doing well.

A current success and a 2004 FLC national award winner is in robust wireless communication technologies. Tarallax Wireless, Inc. has licensed all of these technologies for incorporation into com-



ORNL's Dick Anderson studies a silicon microsensor.

mercial communication devices through a multi-year CRADA.

In addition, Tarallax has sublicensed specific technologies to Navigational Sciences for use in commercial maritime tracking and tagging devices. Navigational Sciences is funding additional R&D at ORNL. This is one of ORNL's largest combined industrial partnerships.

In summary, ORNL employs numerous methods to transfer technology to industry—from the passive “build it and they will come” (publish, present, patent, and wait) to the highly interactive techniques of cooperative R&D and personnel exchanges. A new model of using IP portfolios and engaging new or startup companies has provided some recent successes and certainly interesting interactions.

A key ingredient that has been uncovered is that of a mutual goal of a long-term relationship.

This goal can change the dynamic from customer-supplier to a partnership thriving on mutual benefits. The longer time frame allows cultures to be better understood, communications to improve, and mutual visions and enthusiasm to develop.

*More info:* Contact Jim Hardy at hardyje@ornl.gov or 865-576-8670, or ORNL FLC Representative Larry Dickens at dickenslm@ornl.gov.

Navy Probe to Austin, from page 1

mining exploration and processing, mid to large-scale manufacturing, industry, government, recycling/recovery facilities, and important environmental monitoring and remediation of hazardous waste sites, brownfields, groundwater discharge, landfills, and harbor sediment, to name a few.

The technology offers several advantages over the current state of the art. Because the XRF sensor resides inside a penetrometer, which is a cone tip only a couple of inches in diameter, little soil excavation is required to insert the device into the ground.

As the probe is pushed through the ground, it takes readings along the way, offering higher resolution analysis than with traditional soil sampling. And because offsite transportation of samples and analysis is avoided, profiling can be achieved faster and more cost-effectively compared to laboratory testing.

Importantly, the device does not use a radioactive source. Rather, a miniature x-ray tube is powered by a transformer inside the probe pipe, making it safe for use without advanced training.

The licensing agreement was completed with the NRL and facilitated by TechLink, a Department of Defense-funded technology transfer organization.

TechLink, working closely with the Navy inventor, helped to identify the opportunity, undertook market research, and provided working probes to Austin AI to help with the evaluation and commercial development of the down-hole probe.

See ARS Shields Agricultural, from page 1

**and Mycology Laboratory** (SBML) in Beltsville, Maryland, she has access to its top-notch mycologists, fungal collections, and databases on the location of fungi around the world.

The U.S. National Fungus Collections, part of SBML, are the largest reference collections of fungi in the world.

“I use the lab's host fungus records, keys, descriptions, and computerized information to make an identification that ultimately determines whether the agricultural material in question will be allowed in the country, destroyed, or shipped back to its place of origin,” explained Palm.

This self-described detective also relies on ARS mycologists like **Amy Y. Rossman**, who heads SBML, or

**Gary J. Samuels**. “If I look at a fungus and nothing seems to fit, I'll ask one of them,” said Palm.

“A name is more than just a label,” said Rossman. “When it's a result of detailed observation and knowledge, a name will accurately communicate and predict biological information about a given fungus so that scientifically sound decisions can be made.”

Fungal systematics can have a dramatic effect on decisions about global transport and trade in crops and plants. For instance, ARS scientists brought clarity to the confusion about the Karnal bunt fungus, *Tilletia indica*, in the United States in 1996.

SBML's **Lisa A. Castlebury** determined that the fungus that had worried American wheat growers in the Southeast and threatened the nation's wheat export market was actually an imposter, a Karnal bunt look-alike. The new species she described was *Tilletia walkeri*, or ryegrass bunt.

SBML researchers are also shedding light on the potentially trade-restricting fungi of flowers of the family Proteaceae. Native to the southern hemisphere and predominantly found and grown in South Africa, proteas produce bright, exotic-looking flowers sought after by the cut-flower industry. But while these blooms are fit for bouquets, they are also fine hosts to a range of fungi.

“To protect the protea industry in the United States, APHIS phytosanitary regulations may sometimes result in rejection of shipments from South Africa before they can reach U.S. markets,” explained Palm.

Aiming to create a comprehensive resource for growers, plant pathologists, and the regulatory entities who make quarantine decisions, Palm

and her South African colleagues are busy writing a book—already a couple inches thick—on the different fungi that occur on proteas.

The book, which will include the protea fungi that exist in the United States, Africa and Australia, should facilitate the flow of usable and innocuous plant materials among these countries.

Rossman and Palm both note that more and more fungal specimens in need of investigation are coming through SBML's doors.

“I think the driving force is the growing desire for new flowers and horticultural plants,” said Palm.

But an old favorite, the dogwood tree, has also benefited from the sleuth-

ing of SBML. Dogwoods, including the flowering varieties grown in the East and the Pacific Northwest, are being threatened by an anthracnose fungus.

“The fungus is a serious pathogen,” said Rossman. “Most notably, it's killed a lot of dogwoods in the woods of Catocin Mountain Park in Maryland.”

Causing coal-colored blotches on diseased leaves, the fungus appeared simultaneously on both U.S. coasts, but no one knew exactly what the causal agent was.

Former SBML researcher **Scott Redlin** described the fungal pathogen, *Discula destructiva*, a previously unknown species, thereby laying the foundation for research on this important disease.

Other fungal pathogens requiring the detective work of the Beltsville lab include daylily rust fungus; canker-causing fungi of the genus *Nectria*, which attack hardwood trees like beech, yellow birch, black walnut, and red oak; and the fungus that produces scab on poinsettia.

Every day, Palm receives packages containing carefully wrapped rusts, molds, and mildews from around the globe. On one day in October, her subjects are chrysanthemum leaves. She's focusing on the buff-colored spots, only millimeters across, encrusting the lower surface of the foliage. She recognizes the culprit immediately: *Puccinia hori-*

*ana*. To nonscientists: white rust.

“The specimen was sent to us from a woman whose garden club bought infested chrysanthemum plants from a nursery in another state. She had even planted some of them in her yard,” said Palm.

Palm was able to swiftly confirm what untrained eyes couldn't. White rust, which originated in eastern Asia, is a serious pest affecting garden and pot mums. The fungus produces a type of spore—a basidiospore—that can be spread from plant to plant by wind or splashing water. If left unchecked, it could cost the country's horticultural and floral industries millions of dollars.

#### Challenges—and Compensations

The mycologists quickly agree on their biggest hurdle: a lack of knowledge about the breadth and diversity of fungi worldwide.

“In making an identification, we'll often know the fungus' genus, but not its species, and there can be a significant difference between two species of the same genus. Sometimes, a lot of money can be at stake, as in the case of Karnal bunt,” said Rossman.

To further prove her point about challenges faced by SBML mycologists, Rossman held up a 3- to 4-inch ref-



Fungal spots on a protea leaf from South Africa.



Erin McCray, collections manager, and David Farr, mycologist for ARS, examine a fusiform rust of pine, one of more than 1 million specimens in the U.S. National Fungus Collections.

erence book that lists the fungi known to exist in the United States and said, “I could go out tomorrow and find 20 species that aren't in this book.”

While the mycologists' decisions do have serious implications, Rossman and Palm note that their work does have its lighter side.

For example, the national mycologist before Rossman, Flora Pollack, once described a new fungus that occurs on melon, so she had the honor of naming it. Because the organism shoots out relatively large, round, black spores, she chose *Monosporascus cannonballus*.

## Inside the FLC

T<sup>2</sup> Funding Leads  
Northeast Meeting

Technology transfer funding was the theme of this year's FLC Northeast regional meeting, held August 5-6 in Salem, Mass.

The meeting was a joint effort between the Northeast Region and the Center for Technology Commercialization (CTC), one of six NASA Regional Technology Transfer Centers serving the U.S.

The 30 attendees—representing government agencies, industry, and academia—received valuable information on where to go for funding, available resources, and mechanisms to help them successfully pursue technology transfer efforts.

Northeast Regional Coordinator Hans Kohler and CTC CEO Jim Dunn opened the meeting with a review of the missions of the FLC and CTC, respectively.

Lewis Meixler, Northeast Deputy Regional Coordinator provided an entertaining historical look at Salem.

Other sessions included a panel discussion on technology transfer funding; an examination of cyber crime trends; an update by several Northeast Region labs on their homeland security initiatives; ways that federal labs and states can work together; and barriers to technology transfer and how they can be overcome.

The regional meeting was preceded by an SBIR/STTR Workshop on August 4. The 45 participants were able to attend a number of sessions, including an overview of the Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) programs; success stories; how to write a winning SBIR/STTR proposal; state support for small businesses; and funding.

More info: Julie Evans, jevans@tamimail.com.

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Mid-Continent's  
Fire Fighting Initiative

The FLC Mid-Continent Region has been working on a fire fighting initiative with the USDA Forest Service (FS), and FLC representatives have met with the Fire Equipment Working Team (FEWT) to develop a firefighting needs list.

The FS Missoula Technology and Development Center is looking at a method to evaluate explosives for fire situations, with fire line explosive as the focus.

The following list is a sampling of the needs, problems, and restraints put forth by the USFS and FEWT.

- Would like to see things faster.
- Would like to measure flame diameter, e.g., at a certain diameter fires are started vs. not started.
- Evaluate explosives with "imposed environmental concerns."
- Everything that a wildland firefighter does, and is supplied with, must be dealt with considering safety and environmental issues—from clothing that the firemen need to all of the tools used.
- National Fire Protection Association Standard 1977 covers clothing protection of wildland firefighters, and the USFS has design specifications that meet these standards.
- GPS, communication issues—The Navy war fighter program is involved with this.
- There are continuing studies in progress regarding wildland firefighter breathing protection. Generally, the kind of firefighting being done does not require respiratory protection
- Also of interest are measuring techniques for fire behavior, as well as explosives and fuel issues.

Copies of the presentations delivered by participating federal laboratories, including **Los Alamos National Laboratory, Pantex Plant, Naval Surface Warfare Center-Indian Head, and Port Hueneme Naval Facilities Engineering Service Center** are available upon request. The content will soon be available at <www.zyn.com/flcmc>.

The Mid-Continent Region also participated in a Joint Fire Science Program with **Pat Rodriguez** of the **Air Force Research Laboratory**. Attendees discussed organizing the USFS technology transfer process to make it more efficient and streamlined.

If your lab is interested in working on this project or needs additional information, please contact Ann Kerksieck at <alkerksieck@futurana.net> or 870-241-3382.

T<sup>2</sup> Award Nominations

The FLC is now accepting nominations for the 2005 Award for Excellence in Technology Transfer.

The award recognizes laboratory employees who have accomplished outstanding work in the process of transferring a technology developed by a federal laboratory.

Nominations are made by FLC Laboratory Representatives and judged by representatives from industry, state and local governments, academia, and federal laboratories. Simply being nominated is in itself a high honor.

Only  
FLC Laboratory  
Representatives  
may  
nominate



recipients for these awards. FLC Laboratory or Agency Representatives are not eligible to be nominated—nor may you nominate your immediate supervisor. All other laboratory staff are eligible to be nominated.

The nomination packet consists of submission guidelines, award criteria, a submission cover sheet (Form 05-CS), submission statement (Form 05-SS), and a submission verification checklist.

Also included in the packet is "Keys to Writing Award-Winning Nominations," a compilation of presentations from the FLC's popular "How to Write Winning Award Nominations" workshop. This document can be used as a handy reference guide when writing your nomination.

All submissions for the 2005 FLC Awards for Excellence in Technology Transfer must be received at the FLC Management Support Office by Friday, October 8, 2004.

Three complete sets of each nomination (one original and two copies) must be received by the due date. In addition, an electronic copy of each nomination must be submitted via e-mail by the due date.

The electronic version of a nomination will be used by the FLC for data collection purposes only and will not be accepted as the original submission.

No faxed copies will be accepted, and late submissions will be returned unopened.

A notice verifying receipt of your submission will be sent by the FLC Management Support Office.

To order the nomination packet or if you have any questions about the FLC Awards Program, please contact Michele Chambers at the FLC Management Support Office at (856) 667-7727, x135, or <mchambers@utrs.com>.

The FLC looks forward to receiving your nominations! Good luck!

DC on T<sup>2</sup>, from page 1

The six-page document, coauthored by OMB Director Joshua Bolten and OSTP Director John Marburger, serves as updated guidance for heads of executive departments and agencies concerning R&D priorities and standards for program evaluation based on the R&D investment criteria. Continued emphasis is given by the Bush administration to improved management and performance to maintain "excellence and leadership in science and technology."

The updated R&D budget priorities are intended to "shape the [FY06] budget issued next February," the memo explained, and result from extensive and continuous consultations with the President's Council of Advisors on S&T (PCAST) and collaboration within the interagency National S&T Council.

Finite budgetary resources and a multitude of new research opportunities present federal agency managers with a challenge, the memo notes, that requires careful priority setting and wise choices.

"As we've reiterated previously," Bolten and Marburger said, "agencies must vigorously evalu-

ate existing programs and, wherever possible, consider them for modification, redirection, reduction or termination, in keeping with national needs and priorities."

Federal R&D investment factors favored by the administration are ones that:

- Enable potentially high-payoff activities that require a federal presence to attain long-term national goals, including national security and energy independence
- Sustain specifically authorized agency missions and support the missions of other agencies through stewardship of user facilities
- Enhance the health of the nation's citizens
- Strengthen science, mathematics and engineering education and accomplishments to enable continuation of superiority in math and science
- Support technological

innovation to enhance economic competitiveness and new job growth

• Address the workforce needs of the nation to ensure a scientifically literate population and a robust supply of qualified experts



- Advance fundamental discovery to improve the future quality of life
- Enhance our understanding of the global environment
- Maximize the efficiency and effectiveness of the R&D enterprise through means such as competitive, peer-reviewed award and review processes, and phaseout of programs that are only marginally productive or are not important to any agency's mission
- Strengthen international partnerships that foster advancement of scientific frontiers and accelerate the progress of science across borders.

While little new insight or detail is provided by the memo's description of the interagency R&D priorities, it stresses that federal agencies receiving funding should be prepared to produce:

- A "clear and concise" definition of program activities and priorities in the overall priority area
- An inventory of programs in the baseline budget
- Agency tradeoffs that provide the resources to help produce a coordinated, cross-agency program greater than the sum of its parts
- An interagency implementation plan.

The three primary R&D investment criteria used under the President's management agenda for all R&D programs are: relevance, quality, and performance.

Additional criteria must be met by industry-relevant applied R&D activities.

The OMB-OSTP memo can be found at <www.ostp.gov/html/mo4-23.pdf>.

TVC, from page 2

by a screening committee and scored as to the viability of the technology, the strength of its intellectual property position, and its potential for commercial success. About 30 of these opportunities will reach full project status each year.

Of the 15 to 20 entrepreneurs invited to present at TVC's Annual Equity Capital Symposium, one-third will receive funding.

Other entrepreneurs will make separate presentations to potential investors under the guidance of TVC staff. Altogether, about one-quarter of TVC's clients will receive funding.

#### The Equity Capital Symposium

The Annual Equity Capital Symposium in New Mexico has been connecting entrepreneurs to investors since 1994. In 2003, TVC produced its first annual symposium in northern California.

In ten-minute presentations, entrepreneurs tell their stories to venture capitalists, angel investors and investment bankers.

The presentations are the end result of efforts by the entrepreneurs and TVC that may have taken more than a year to develop.

The regimen is not for the weak at heart; demands courage, determination, passion and acceptance of risk. The symposium is not just a two-day event, but rather the culmination of over eight months' effort by the entrepreneurs and their TVC counterparts.

More than 150 companies have presented since 1994. Of these, one in three have received funding, an extraordinary national accomplishment (nationally the average is one in a thousand); currently, 82 percent of the companies are thriving.

The next Equity Capital Symposium will be held in northern California on September 16 and 17 (see [www.ca-ecs.org](http://www.ca-ecs.org)).

Examples of presented technologies include advanced flywheel systems to replace batteries and a catalytic converter that removes carbon monoxide.

To learn more about Technology Ventures Corporation, visit [www.techventures.org](http://www.techventures.org).

## FLC T<sup>2</sup> Training Resources, Part 2 (cont. from the August issue)

### Where to Find T<sup>2</sup> Training

While it is important to identify the trends in technology transfer (discussed in the August issue of *NewsLink*) to help guide the education and training of a technology transfer professional, it is also important to see developing trends at the provider level—that is, where is the best place to go for training?

For technology commercialization training, it pays to plan ahead. Knowing where to go to find the necessary training resources can typically save hours of fruitless searching and misused resources.

Over the past two years, we have interviewed dozens of technology transfer professionals; all have expressed concerns over time management.

In this era of ever-expanding technology transfer opportunities, T<sup>2</sup> professionals must do more in the same amount of time, including training. The resulting stress can be alleviated by solid planning and an understanding of the training landscape. In an effort to relieve some time issues, the following paragraphs address some patterns and trends that should prove helpful.

Our research identified training topics according to the types of providers that offer them. These topics include training in T<sup>2</sup> legislation, licensing, best practices, technology assessment, marketing/outreach, T<sup>2</sup> mechanisms, intellectual property, and venture capital funding.

For training in the mechanisms of technology

transfer (e.g., CRADAs), the best place to find resources appears to be federal laboratories, since most training resources reside within the federal community.

There is a variety of technology transfer mechanism resources, both online and in lecture format, within the federal commu-

### Method of T<sup>2</sup> Training Delivery Among Providers

	Online	Classroom (on-site)	Classroom (off-site)	Mixed Mode	Other	Total
Federal	48	27	3	1	2	81
T <sup>2</sup> Organizations	2	26	14	0	1	43
Academia	12	68	0	2	0	82
Other	0	44	0	0	0	4
Total	62	165	17	3	3	250

nity. Within colleges and universities, the most available training resources are in licensing and intellectual property, with these topics accounting for 42% of all academic training resources.

Within the specialized technology transfer organizations, the trend is toward "best practices" training resources, which include training in fostering innovation, collaborating across boundaries, and analysis of creative management techniques.

Look for part 3 of this 3-part series in the October issue of FLC NewsLink. Kevin Permenter and Kelvin Willoughby of the FLC T<sup>2</sup> Training Resources Project and Steve Boardman of the FLC Education and Training Committee contributed to this article. The FLC Education and Training Committee is chaired by Lynn Murray of the Volpe National Transportation Systems Center. Lynn can be reached at [murrayl@volpe.dot.gov](mailto:murrayl@volpe.dot.gov).

T O D A Y   A T   W W W . F E D E R A L L A B S . O R G



### Locate Technology

Locate federal laboratories ready to transfer their technologies to the marketplace and find laboratories ready for collaborative R&D.



### Find a Laboratory

Use the FLC web site to find a federal laboratory in your region.



### Enhance Your T<sup>2</sup> Knowledge

Visit the T<sup>2</sup> Education and Training page to learn about the tools and services available to help government, industry, and academia sharpen their techniques.



### Mark Your Calendar

See the Upcoming Events page to learn where and when T<sup>2</sup> events are taking place.

