FLC NATIONAL AWARDS

BRIDGING

FEDERAL TECHNOLOGIES AND INDUSTRY

Pittsburgh, PA • May 3, 2012

Welcome to the 2012 FLC Awards

Thank you for joining us in Pittsburgh for the 2012 FLC awards. It is fitting that we are honoring our award winners in Pittsburgh, as it is known far and wide as the "City of Bridges." The accomplishments of the FLC awardees are evidence of what happens when the gap among federal laboratories, industry, and academia is bridged to create technologies that range from improving our quality of life to life-saving. This type of bridge-building is, of course, at the heart of the FLC's mission.

Reflecting the diversity of technology transfer efforts within the FLC and the people who make it happen, we present awards in eight categories:

Award for Excellence in Technology Transfer – recognizes employees of FLC member laboratories and non-laboratory staff who have accomplished outstanding work in the process of transferring federally developed technology.

Interagency Partnership Award – recognizes agency and/or laboratory employees from at least two different agencies who have collaboratively accomplished outstanding work in transferring a technology.

State and Local Economic Development Award – recognizes successful initiatives that involve partnership between state or local economic development groups and federal laboratories for economic benefit.

STEM Award – recognizes the efforts of an FLC laboratory employee (or team) that has demonstrated outstanding work in support of science, technology, engineering, and mathematics (STEM) education during the past year.

Rookie of the Year Award – recognizes the efforts of an FLC laboratory technology transfer professional with three years (or less) experience who has demonstrated outstanding work in the field of technology transfer in a manner significantly over and above what was called for in the normal course of their work.

Outstanding Technology Transfer Professional Award – recognizes the efforts of an FLC laboratory technology transfer professional (or team) who has demonstrated outstanding work in transferring a technology in a manner significantly over and above what was called for in the normal course of their work.

Laboratory Director of the Year Award - honors directors of FLC laboratories who have made maximum contributions to support technology transfer activities in their organizations.

FLC Service Awards – presented to individuals, inside or outside the FLC, who have provided significant support to the technology transfer process, thus furthering the FLC's mission: Outstanding Service Award, Representative of the Year Award, and the Harold Metcalf Award for lifetime achievement.

The FLC awards are a prestigious honor in the technology transfer world, with dozens of federal laboratories submitting nominations each year. These awards have become a source of great pride for both the laboratories and their government agencies. As you read this booklet, you will be impressed with the experience, expertise, and resources of these award winners. I am extremely pleased and proud to present the recipients of the 2012 FLC awards.

James Poulos III
Awards Committee Chair

AWARDS SUMMARY

AWARDS FOR EXCELLENCE IN TECHNOLOGY TRANSFER

Argonne National Laboratory
Resin Wafer Electrodeionization

U.S. Army Engineer Research and Development Center - Construction Engineering Research Laboratory
Nanometer-Scale Wet Sample Imagery for Transmission Electron Microscopes

Agricultural Research Service
Ecologically Based Invasive Plant Management of Invasive Annual Grasses

Agricultural Research Service
Honey Bee Breeding, Genetics and Physiology Laboratory
Honey Bees With Varroa-Sensitive Hygiene

Agricultural Research Service, Midwest Area
Virtual Grower Software for Greenhouse Crop Production

Department of Health and Human Services
Centers for Disease Control and Prevention
Heat-Inactivated Rotavirus Vaccine

U.S. Army Edgewood Chemical Biological Center
Tactical-Biological Detector

Los Alamos National Laboratory
INFICOMM: Wireless Monitoring Technology for Oil and Gas Wells

Los Alamos National Laboratory
Recycling of Strontium-82 for Use in Medical Diagnostic Imaging

Glenn Research Center
Stretched Lens Array: Ultra-Light, Affordable Green Energy Technology

Naval Air Warfare Center Aircraft Division, Patuxent River
NavSolve™ Environmentally Friendly Cleaning Solvent

Naval Air Warfare Center Aircraft Division, Patuxent River
Air-Conditioning System (OxiCool)

National Institutes of Health
National Cancer Institute
Development of Eribulin, a Potent Anti-cancer Agent, From a Marine Sponge

National Institutes of Health
National Cancer Institute
An Interactive Software Package for the Analysis of Microarray Data

National Energy Technology Laboratory
Development of a Platinum-Chromium Alloy for Improved Coronary Stents

National Institute of Neurological Disorders and Stroke
Use of Therapeutic Antibodies as a Novel Treatment for Multiple Sclerosis

National Institute of Neurological Disorders and Stroke
Vibro-Tactile Stimulation Device and Method for Swallowing Disorders

National Security Agency
Method of Tampering Detection for Digital Devices (AutoBerry)

Naval Surface Warfare Center, Panama City Division
Advanced Diver's Mask-Mounted Display System

Oak Ridge National Laboratory
Materials for a Low-Cost, Clean Cookstove

Pacific Northwest National Laboratory
Chemically Etched Emitters for Nanoelectrospray Ionization Mass Spectrometry

Sandia National Laboratories
Fuel Cell Mobile Light

711th Human Performance Wing
USAF School of Aerospace Medicine
Cone Contrast Test for Detection of Color Vision Deficiency

INTERAGENCY PARTNERSHIP AWARD

Department of Energy
Pacific Northwest National Laboratory

Department of Defense - Navy
Naval Sea Systems Command
Naval Surface Warfare Center, Carderock Division

HAROLD METCALF AWARD

Victor Chavez
Department of Agriculture
Agricultural Research Service, North Atlantic Area

LABORATORY REPRESENTATIVE OF THE YEAR AWARD

John Dement
Department of Defense – Navy
Naval Surface Warfare Center, Crane Division

OUTSTANDING TECHNOLOGY TRANSFER PROFESSIONAL AWARD

Dr. Charles Schlagel
Department of Defense – Navy
Naval Medical Research Laboratory

ROOKIE OF THE YEAR AWARD

Holly Victorson
Department of Defense – Air Force
Air Force Research Laboratory, Space Vehicles Directorate

STATE AND LOCAL ECONOMIC DEVELOPMENT AWARD

Department of Energy
Sandia National Laboratories
Sandia Science and Technology Park

STEM AWARD

Ricardo Negron
Department of Defense – Air Force
Air Force Research Laboratory

LABORATORY DIRECTOR OF THE YEAR AWARD

Douglas Bowers
Department of Defense – Air Force
Air Force Research Laboratory, Propulsion Directorate

Michael Kluse
Department of Energy
Pacific Northwest National Laboratory

Dr. Samuel Aronson
Department of Energy
Brookhaven National Laboratory

Awards for Excellence in Technology Transfer

DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Honey Bee Breeding, Genetics and Physiology Laboratory

Honey Bees With Varroa-Sensitive Hygiene

Honey bees pollinate over 100 crops in the U.S., and they are extremely vital to agriculture. Unfortunately, the bees are being attacked by tiny, exotic parasitic mites, Varroa, which feed on bees developing inside the hive. Large infestations of mites weaken or kill whole bee colonies. To protect bees, the Honey Bee Breeding, Genetics and Physiology Laboratory developed a genetic strain of bees that is capable of fending off Varroa mites. The bees have a trait termed Varroa-sensitive hygiene (VSH), a specific form of nest cleaning behavior focused on removing the Varroa-infested brood. Introgressing the genes that constitute the VSH trait into previously susceptible honey bees provided resistance to the Varroa mite.

After the VSH trait was developed, a multifaceted approach was used to transfer the technology to the beekeeping industry. The primary means of transfer involved a Cooperative Research and Development Agreement (CRADA) with Glenn Apiaries, which made the technology available to other queen breeders. This in turn allowed the technology to be utilized by other honey bee breeders who receive VSH semen for breeding through Material Transfer Agreements (MTAs). The result was that the VSH trait has been widely distributed as a publicly available breeding stock, with at least 25% of the queens now sold carrying the VSH trait.

The rate of adoption is surprising to many in the honey bee industry because of the habit of beekeepers to buy the strain of queen they have always used. The value of this to agriculture is significant because of the role honey bees play as crop pollinators. Pollination of U.S. crops by honey bees has been valued at $15 billion annually, based on estimates by Cornell University scientists. Improving bee health by the transfer of VSH technology has limited the loss of effective bee pollination by sustaining the availability and vigor of bee colonies. A conservative estimate of just one percent of the industry's value represents a value of $150 million to U.S. agriculture.

Left to right: Tom and Suki Glenn, Dr. Jeff Harris and Dr. Robert Danka

Contact: Dr. Bob Danka • (225) 766-9280 • bob.danka@ars.usda.gov

Virtual Grower Software for Greenhouse Crop Production

Virtual Grower is a decision support software program designed to assist greenhouse growers and users by predicting heating and energy use specific to their location, greenhouse design, crops produced, and management preferences. Virtual Grower brings together several existing and new models, model components, and model approaches so that playing "what-if" simulations in one area (e.g., changes in energy use) will influence other areas (e.g., growth and development rates) in a safe virtual environment.

Virtual Grower has been disseminated primarily through a website (www.virtualgrower.net). CD copies of the program have been distributed to industry professionals through site visits, scientific conferences, and industry trade shows, while scientific and popular press articles about Virtual Grower have spread the word about the software's capabilities. The software has been incorporated into floriculture curriculums at universities across the United States. The online tutorial videos demonstrate the abilities of the program and guide users through the layout of the system.

The development and distribution of this novel tool have helped greenhouse owners/operators save millions of dollars in energy costs by identifying easy-to-make changes in management or structures, helped hundreds of students around the country learn about greenhouse operation, and assisted dozens of greenhouse growers with building new, energy-efficient structures or additions.

Although the weather database includes only U.S. sites, the software has been downloaded over 10,000 times since its release in over 50 countries and is being utilized on all continents. The Spanish and French versions have expanded the reach of software users. Tutorial videos offer the opportunity for users to educate themselves—and revisit areas of the software—in a comfortable setting. In addition, the software has given growers the power to test ideas themselves as an alternative to the recommendations of salesmen or the expense of hiring consultants.

Team members: Dr. Jonathan Frantz, Bryon Hand, Deanna Bobak, Lee Buckingham, Erik Runkle

Contact: Dr. Jonathan Frantz • (207) 745-3403 • jonathan.frantz@ars.usda.gov

DEPARTMENT OF AGRICULTURE
Agricultural Research Service

Ecologically Based Invasive Plant Management of Invasive Annual Grasses

Invasive species are predominantly annual grasses that aggressively displace native perennial grasses, fostering frequent and destructive fires, and posing a serious and growing threat to western rangeland. Annual grasses also dramatically reduce plant diversity and richness; reduce suitable habitat for wildlife; reduce livestock forage by 50-80%; accelerate erosion; and pose a serious risk to human life by promoting out-of-control wildfires, often near urban areas. Due to these problems, there is an acute need to check and reverse the spread of these invasive species.

Researchers at the Agricultural Research Service have developed a "systems approach" to managing and reversing the spread of various invasive species. Known as ecologically based invasive plant management (EBIPM), this approach is comprised of a decision-support system that assesses the health of rangeland to identify causes of invasion, identifies ecological processes in need of repair, proposes ecological principles as "rules of thumb" for altering the ecological processes to correct those in need of repair, allows land managers to select and integrate tools and strategies to alter the appropriate ecological processes, and allows the implementation of adaptive management.

The area-wide project for EBIPM of invasive annual grasses is on track to transform the previously accepted management of western rangelands. The Department of Agriculture estimates that more than 3,000 producers and land managers to date have been directly impacted through training or delivery of EBIPM products. Another 8,000 to 12,000 have experienced some indirect impact as a result of EBIPM information distributed through print or video media. Research and demonstration projects in a five-state region have had a direct impact on invasive annual grass management of 500,000 acres. Another 2.5 million acres have been indirectly impacted through the use of EBIPM strategies to manage these species. This impact will only continue to exponentially increase as the program reaches expanded audiences. The value of improved management to producers across 20 years is projected to be more than $168 million.

Left to right: Stuart Hardegree, Tom Monaco, Roger Sheley, Brenda Smith, Ryan Steineckert

Contact: Roger Sheley • (541) 573-8938 • roger.sheley@ars.usda.gov

Tactical-Biological Detector

Bad things can come in tiny packages. The post-9/11 anthrax mailings drove that point home in a dramatic manner. Fortunately, America has a new sentinel on duty—the Tactical Biological Detector (TAC-BIO), an aerosol biological detector that has redefined the state-of-the-art with its small, low-cost, low-power design. The TAC-BIO team started with a well-known detection principle—namely, that airborne biological agents excited by certain ultraviolet light will fluoresce and scatter light in a specific and identifiable manner—and then improved nearly every element of the long-standing detection technique.

TAC-BIO is a truly man-portable unit. Compared to competing technologies, TAC-BIO has a 50% smaller footprint, weighs 80% less, consumes only 4% as much power, and manages all of this in a cost-effective platform. Previous fluorescent detection systems required expensive, high-powered ultraviolet lasers. The TAC-BIO team eschewed the tried-and-true laser sources and instead built their device on semiconductor ultraviolet optical sources (SUVOS). They developed an entirely new front-end assembly with a novel airflow system to pull air into the detector unit where the SUVOS laser device illuminates the sample. Any biological particle present will fluoresce and scatter a portion of the light. Novel mirrors and other optics focus the resulting fluorescence and scatter onto a detector, where a unique photon-counting technique is used to quantify the results for analysis by an onboard microprocessor. Audible and visible alarms are sounded if the unit reaches threshold levels of detection.

Left to right: Richard Kreis, Lester Strauch, Aime Goad, Richard Sickenberger, David Sickenberger, Fiona Narayanan, Dr. Jerry Cabalo
Not pictured: Dr. Russell Chipman and Dr. Karlton Crabtree

The Edgewood Chemical Biological Center licensed TAC-BIO to General Dynamics Armament and Technical Products and to Research International, Inc. One technology transfer recipient has already completed a substantial commercial sale and is poised for a follow-on deal. Both recipients are on or ahead of their development and sales schedules. Of critical importance to the Department of Defense is that one licensee is a candidate for a $117 million U.S. military acquisition.

The technology emerged from the creative and unique collaboration of nine researchers from a large federal lab, industry, and academia working to build a new sensor from the ground up around a novel laser light source. The effort yielded five patents, novel optics, a unique air intake system, and a new optical interrogation technique. TAC-BIO is designed to detect airborne biomaterials, with an emphasis on bio-threat agents such as anthrax.

Contact: David Sickenberger • (410) 436-5533 • david.w.sickenberger.civ@mail.mil

DEPARTMENT OF DEFENSE – U.S. ARMY
U.S. Army Engineer Research and Development Center
Construction Engineering Research Laboratory

Nanometer-Scale Wet Sample Imagery for Transmission Electron Microscopes

Conducting real-time observation of materials interactions at molecular-level resolution and in the native gas or liquid environment has been one of the frontiers of electron microscopy. In transmission electron microscopy (TEM), imagery is subject to a high vacuum, making it extremely difficult to observe the dynamic interactions of unaltered samples in their native environments. The absence of an in-situ testing environment inside the microscope became a significant obstacle to advancing scientific observations across the fields of biomedical research, chemical engineering, materials science, and nanoscience.

A research team from the U.S. Army's Engineer Research and Development Center, Construction Engineering Research Laboratory (ERDC-CERL) recognized the emerging need for new methods to obtain basic physical properties of nanoparticles in solution while using conventional imaging equipment. They partnered with researchers at the University of Illinois' Frederick Seitz Materials Research Laboratory (UI FS-MRL) to perform further investigations. These efforts subsequently led to a joint patent application in February 2009 for a wet sample TEM holding device that would enable the observation of basic physical properties of nanoparticles in solution.

In 2008, ERDC-CERL brought commercial capabilities in this field together with funding from the Army Small Business Technology Transfer (STTR) research program. Hummingbird Scientific was awarded an STTR Phase I contract based on a work plan deploying its own independent research for a solution. After establishing the excellence of its project approach, Hummingbird Scientific was granted Phase II project funding in October 2009. Company researchers have achieved significant breakthroughs in the development of an in-situ TEM holder that enables high-resolution imaging of the microstructure of materials in liquid environments. This state-of-the-art device allows direct correlation of materials properties with their microstructure and processing conditions while in relevant environments.

Left to right: Dr. Charles Marsh, Norman Salmon
Not pictured: Bea Shahin

Hummingbird Scientific's specimen fluid holder devices have been commercially available since 2010. In addition, researchers from Department of Energy laboratories have bought systems to further their energy materials research goals by performing in-situ TEM research into electrochemical processes that are relevant to battery materials and corrosion. Hummingbird Scientific has been approached by research groups around the country interested in purchasing its liquid holders to further the goals set out by their sponsoring agencies, including the National Institutes of Health, National Science Foundation, and the Department of Commerce.

Contact: Bea Shahin • (217) 373-7234 • Bea.S.Shahin@usace.army.mil

Air-Conditioning System (OxiCool)

The Naval Air Warfare Center Aircraft Division, Patuxent River recently concluded a highly successful transfer of technology that promises to benefit numerous applications in both the military and commercial sectors for years to come. The transfer has its roots in the Navy's modular portable air conditioner (MPAC), a man-mounted, personal air-conditioning system capable of cooling aviators, soldiers, and other wearers in extreme heat conditions.

Entrepreneur Ravikant Barot expressed an interest in the MPAC technology, which the Center was receptive to. Patuxent River provided technical assistance from MPAC's inventors, and then helped establish a Cooperative Research and Development Agreement (CRADA) with Barot's new company, OxiCool, Inc.

During this effort, both parties began exploring alternative applications for the MPAC technology, which eventually led to the development of a patented "green," all-natural air-conditioning system. Unlike conventional electricity-driven cooling systems, the air-conditioning system does not need a compressor, uses water as a refrigerant, contains no harmful substances, and uses waste heat rather than electricity as its power source.

This unique cooling system has the potential for numerous applications throughout industry and the military. But the technology is currently being targeted to the trucking industry, which is facing ever-increasing restrictions on the idling time of tractor trailers. These regulations mean substantially higher costs to drivers, who no longer can stay in their cab's sleeping berths cooled by an idling engine. The new, all-natural air-conditioning system can cool truck berths without the engine running. OxiCool and its commercial partner (which requests anonymity as one of the nation's top three truck manufacturers) have pooled resources and are collaborating with Patuxent River to convert the air-conditioning system into OxiCool, a cooling system designed specifically for tractor trailers.

Top left to right: Rear Admiral Randolph L. Mahr, Dr. Jonathan W. Kaufman, Ravikant Barot, Stephan Coleman, Gary Kessler
bottom left to right: Paul Fritz, Michelle Miedzinski
Not pictured: Paul Dolinar

Tractor trailers are just one of many promising applications. After renewing the CRADA in 2010, researchers identified several military applications for which the OxiCool system can be adapted to provide quiet, environmentally clean cooling to mine-resistant, ambush-protected vehicles, tanks, and submarines, to name just a few opportunities. Eventually, OxiCool will target U.S. homes, where the system's non-reliance on electricity is expected to significantly reduce the load on the nation's electrical grid.

Contact: Paul Fritz • (301) 342-5586 • paul.fritz@navy.mil

DEPARTMENT OF DEFENSE – U.S. NAVY

Naval Air Warfare Center Aircraft Division, Patuxent River

NavSolve™ Environmentally Friendly Cleaning Solvent

Designed to meet the strictest air quality standards in the nation, NavSolve™ provides an environmentally friendly, nonpetroleum-based cleaning solution for military and commercial applications ranging from parts washing to weapons to aircraft engine cleaning. The solvent contains no hazardous air pollutants and fewer than 25 grams of volatile organic compounds (VOCs) per liter, and has been certified for use within the South Coast Air Quality Management District (AQMD).

The Navy began collaborating with the Defense Logistics Agency in 2008 to develop a low-VOC cleaner after the South Coast AQMD and other jurisdictions began enacting strict VOC regulations. Traditional petroleum-based cleaning solvents for Type II applications contain more than 700 g/l of VOCs, as well as high levels of hazardous air pollutants, which can lead to serious health and environmental problems. NavSolve offers a safe alternative, allowing Navy bases and other military facilities located in areas with strict VOC regulations to remain in compliance without compromising cleaning performance.

NavSolve was invented by Dr. El Sayed Arafat, who showed extraordinary perseverance and dedication in creating an alternative to high-VOC cleaners, thus resolving a significant threat to the Navy's ability to service its fleet. To ensure a competitive marketplace, Dr. Arafat and the Patuxent River technology transfer team determined that NavSolve should be commercialized by multiple licensees. Twenty-five potential licensees for NavSolve

Left to right: Rear Admiral Randolph L. Mahr, Dr. El Sayed Arafat, Gary Kessler

were identified, and 12 of those entered into partnerships with Patuxent River to conduct their own evaluation tests of the technology. In addition, Armick Chemicals of Grand Rapids, Mich., entered into a personal licensing agreement with Patuxent River in 2010 to add NavSolve to its product line, which includes cleaning agents NavClean and NavGuard. In 2011, Patuxent River signed a second Patent License Agreement (PLA) for NavSolve, this time with Ecolink, Inc., of Tucker, Ga.

Worldwide, cleaning solvents represent a $5 billion market. Although environmentally friendly solvents constitute just a portion of that, it is a significant portion. With the development and licensing of NavSolve, Patuxent River and its licensees are well-positioned to benefit from a growing demand for a high-performing, low-VOC solvent.

Contact: Dr. El Sayed Arafat • (301) 342-8054 • elsayed.arafat@navy.mil

Advanced Diver's Mask-Mounted Display System

Until now, divers working in dark, murky waters haven't been able to effectively survey and assess their surroundings. But with the Advanced Diver's Mask-Mounted Display System, it's a new underwater world. The transformational flip-up/flip-down device is like an "underwater night vision" system that allows divers to see what they're doing, whether looking for mines, scanning for intruders, inspecting ship hulls, recovering a body, searching for evidence, or studying fish behavior.

The 800 x 600 super video graphics array (SVGA) screen incorporates organic light-emitting diode (OLED) displays that are color-balanced and contrast-matched, giving the diver an astonishingly clear and actionable view. The fixed-focus optical system was designed and manufactured using multi-element lenses that provide an extended eye-relief, allowing the system to be placed outside the dive mask without losing full display-screen field-of-view. The binocular lens arrays are assembled at an offset angle that accommodates approximately 95 percent of divers without the need for inter-pupillary adjustment.

Dennis Gallagher

Built to withstand use at depths of 300 feet, the mask-mounted display system is a whole new ballgame when compared to anything previously available, offering higher contrast, brighter color, smaller size, lighter weight, larger eye relief, lower cost, and lower power consumption. In addition, a low-magnetic version will be available for use by Navy Explosive Ordnance Disposal divers.

The Advanced Diver's Mask-Mounted Display System technology was transferred via a Cooperative Research and Development Agreement (CRADA) and partially exclusive licensing agreement between the Naval Surface Warfare Center, Panama City Division and Sound Metrics Corporation. Based in Lake Forest Park, Wash., Sound Metrics was formed in 2002 by a group of researchers who had been working at the University of Washington's Applied Physics Lab. This was the company's first CRADA experience, and it has gone exceedingly well, with mask-mounted displays currently in manufacture and slated for availability to military and private-sector divers in December 2011.

Contact: Dennis Gallagher • (850) 235-5417 • dennis.g.gallagher@navy.mil

DEPARTMENT OF DEFENSE – U.S. AIR FORCE
711th Human Performance Wing
USAF School of Aerospace Medicine

Cone Contrast Test for Detection of Color Vision Deficiency

Performance experts at the Air Force Research Laboratory's 711th Human Performance Wing, USAF School of Aerospace Medicine, have collaborated with Innova Systems, Inc., in the deployment of a new color vision test system. The Cone Contrast Test (CCT) is a software-generated clinical test that indicates vision deficiency type and severity, and can quantify the realm of normal color vision. The CCT also can distinguish hereditary color vision loss from that caused by disease, trauma, medications and environmental conditions, and facilitates the detection and monitoring of disease.

Whether genetic or acquired, color vision deficiency—commonly known as color blindness—makes it challenging, or even impossible, to hold certain jobs in military and civilian sectors alike. Current test methods typically provide only a pass/fail determination. As a direct consequence to the USAF, candidates must be excluded as pilots if they have deficient color vision, despite the relative degree of deficiency. Furthermore, conventional testing is well-known to incorrectly label color vision as "normal" when it is actually deficient.

A person's ability to see colors depends upon a complex mechanism involving the retina, a neuro-membrane lining the inside-back portion of the human eye. The retina contains two types of light-sensitive cells, rods and cones, which convert light energy into signals carried via the optic nerve to the brain. Only the cones—characterized as red, green, and blue types—are sensitive to color. The CCT is superior to conventional color vision testing in that it presents a random sequence of colored letters, each visible to just one cone type at a time, in order to provide a cone-specific numeric score. This score determines the cone contrast sensitivity threshold, thereby enabling decisions about occupational selection and the risks posed to performance.

Top left to right: Col. John Gooch, Cheryl Nordstrom; Bottom left to right: Steve Nordstrom, Dr. Jeffrey Rabin

As a direct result of the technology transfer effort implemented by the USAF Aerospace Medicine Consultation Service with Innova Systems, the CCT has been implemented at more than 100 active duty and reserve USAF bases. The testing availability will reduce travel to test-specific bases, netting the USAF an estimated savings of about $100,000 per year. Savings resulting from improved safety, performance, and accident avoidance could easily reach tens of millions of dollars for every military aircraft accident avoided. As the system is adopted commercially, persons with occupations in the aviation, transportation and first responder industries will be tested to better determine their visual capabilities for operations in the color-rich world of digital display panels, in which undetected deficiency, however slight, can become problematic.

Contact: Dr. Jeff Rabin • (210) 842-8653 • rabin@uiwtx.edu

Method of Tampering Detection for Digital Devices (AutoBerry)

With more than 1.8 billion smartphones expected to be in use by 2013, the security of these and other digital devices are of critical concern to national security and global commerce. A team at the National Security Agency Information Assurance Directorate (NSA/IAD) has made a significant contribution to maintaining that security with their patented Method of Tampering Detection for Digital Devices, or AutoBerry.

The scanning software can quickly detect anomalies by extracting application and operating system files and comparing the results to a known good baseline. This "finger-printing," combined with AutoBerry's alert system that indicates level of risk associated with various anomalies, allows administrators, security personnel and other users to either quickly get the device back in use or, if compromised by tampering or other malicious activity, seek additional forensics support and remediation. The scan takes only 5 to 17 minutes depending on the device—a dramatic decrease from the 1.5 hours typically required for a manual security check—and requires minimal technical training.

AutoBerry was developed in 2006 and first used with the BlackBerry, then the predominant mobile device used throughout government. Not only was AutoBerry included in the Defense Information Systems Agency Security Technical Guide (DISA STIG) in 2008, federal agencies not mandated by STIG also began incorporating it into their guidelines, compounding its impact across government. At the time of transfer, more than 250,000 users at every level of government relied on it to maintain the integrity of their digital devices.

Left to right: Daryle Deloatch, Rick Segal, Mark Haney, Kathy Bogner

AutoBerry was transferred to Fixmo, Inc. in 2010, just three months after the company learned of the technology. Since then, Fixmo has launched three products, including Sentinel, its flagship product for government users, which offers enhanced AutoBerry features for BlackBerry, Android, iOS and Good devices, and which is marketed to industry as Sentinel Desktop; Sentinel Enterprise, an enterprise solution and expansion of Sentinel Desktop; and Sentinel Server Compliance Check, which audits, corrects and confirms server configuration. Fixmo anticipates $25 million in revenue in 2012 and has already applied for three additional patents for Sentinel-related technology.

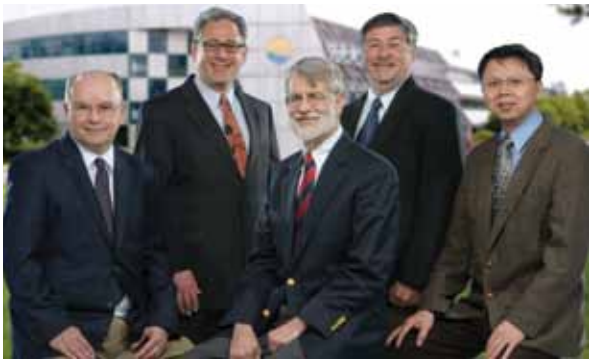
Contact: Daryle Deloatch • (410) 854-6263 • ddeloatc@restarea.ncsc.mil

DEPARTMENT OF ENERGY
Argonne National Laboratory

Resin Wafer Electrodeionization

A team from Argonne National Laboratory has developed innovative resin-wafer electrodeionization (RW-EDI) technology that is an advanced application of electrodialysis (ED). With ED, a solution is passed through a channel between ion exchange membranes. An applied electric field causes charged species to cross the membrane, while the neutral species pass down the channel. In RW-EDI, Argonne adds a manufactured wafer that adds conductivity to the process channel, enabling charged species to be recovered at much more dilute levels. RW-EDI uses less electricity than ED and works at much lower concentrations. The team is using it for both the recovery of charged products (renewable chemicals) and the removal of charged species from solution (desalination of water).

Argonne's resin-wafer technology is made from commercially available materials. By controlling dimensions, composition, porosity and conductivity, the resin-wafer technology can be easily adapted to a target product. Nalco Company licensed the RW-EDI technology from Argonne, and Archer Daniels Midland (ADM) will be one of its first end-users. Argonne, Nalco, and ADM are jointly developing the technology to improve energy efficiency and environmental performance in integrated biorefineries. RW-EDI will significantly reduce the cost of producing clean energy, renewable chemicals, and water used in industry.



Left to right: Michael Henry, William Ragland, and Dr. YuPo Lin standing from left to right: Seth Snyder and Edward St. Martin Not pictured: Manian Ramesh, Cathy Doucette, Lisa Wesoloski, Jitendra Shah, Wayne Carlson, Thomas Binder, Rishi Shukla and James Foster

One notable use for the technology is to process biomass-based feedstocks into biofuels and chemicals. Specifically, Argonne's patented technology allows for the deionizing or continuous removal of charged products, like organic acids, from aqueous streams and eliminates the requirement to continuously add neutralizing agents. Conventional bioprocessing technologies require significant capital expenditures or energy-intensive steps to recover these products, and they typically generate large waste streams. Controlling the processing costs is critical to the commercial success and growth of these product markets, especially if they are to be cost-competitive with fossil-based products.

Contact: Seth Snyder • (630) 252-7539 • seth@anl.gov

INFICOMM: Wireless Monitoring Technology for Oil and Gas Wells

Few issues have consistently captured national attention during the past year as energy security. Energy is the lifeblood of the world economy, and global energy demand continues to escalate. Ensuring that the United States has a reliable, affordable, and clean energy supply is critical to our national security. The transfer of INFICOMM (short for infinite communication), a wireless technology used to collect real-time temperature and pressure information from sensors in oil and gas wells, is helping to secure our energy future.

Left to right: John Russell, Manny Gonzalez
Not pictured: Scott Ellis

INFICOMM has no fragile wires, is low cost, and can operate in high-temperature environments. INFICOMM is based on the concept of "modulated reflectance," requiring electrical power only above ground. Specialized crystals in the downhole sensors react to signals sent by INFICOMM by vibrating, or resonating. The signal frequency that "reflects" wirelessly back up the hole, to be saved in a computer, is the crystal's distinct "vibe" that varies with (and thus reveals) downhole temperature and pressure. The collected data improves well yields, saving producers millions of dollars per well. In addition, it enhances oil recovery efforts that should increase domestic oil production and increase U.S. energy security.

The technology was developed at Los Alamos National Laboratory (LANL) as a battlefield communication capability for the Department of Defense. Chevron contacted LANL to see if this technology could solve problems faced by the oil industry. In 2004, LANL and Chevron entered into a Cooperative Research and Development Agreement that developed the INFICOMM application and also fostered the formation of the Alliance for Advanced Energy Solutions. Former LANL technical staff members were hired by Chevron to set up a workshop in Santa Fe, N.M. There, using the indispensable duct tape and silicon, they produced an INFICOMM prototype that worked better and longer than industry standards, and then refined the product.

In 2009, Chevron spun off INFICOMM as a separate commercial company that officially became INFICOMM, Inc. in 2010. The first INFICOMM-manufactured unit was used in the fall of 2011 in a well in Chevron's San Joaquin Valley, Calif., operations; and is scheduled to be used this year in Chevron's mid-continent and Alaska oil fields. Plans are being made for INFICOMM to be used in Texas and internationally, and sold to customers other than Chevron.

Contact: John Russell • (505) 665-3941 • jrussell@lanl.gov

Recycling of Strontium-82 for Use in Medical Diagnostic Imaging

Currently, there is a very high demand for radioisotopes used in medical diagnostics and nuclear medicine. Heart imaging using Positron Emission Tomography (PET) utilizes the Strontium-82 (Sr-82) isotope, which is used to diagnose coronary artery disease. Hospitals nationwide currently diagnose about 700 patients per day using PET heart imaging, and this number is rapidly increasing. Given this high and increasing demand, there is tremendous pressure to produce the Sr-82 isotope.

As the demand for this radioisotope has increased, demand has at times outstripped production; and there is always the potential for a shortage, which can cause thousands of patients to wait for diagnosis. The Sr-82 recycling process produces this isotope without the long periods of downtime and maintenance required by particle accelerator production facilities. Clinical and hospital facilities return the used product from PET imaging to Los Alamos National Laboratory (LANL). Manhattan Isotopes, LLC (MIL) obtains this material from LANL and recycles it, reducing waste and producing a viable and valuable product.

The LANL patented recycling process licensed to MIL produces a precursor radioisotope (Sr-82) required to make a radioactive heart imaging agent. The Sr-82 is called a "generator" because it generates the other, short-lived isotopes that are injected into the body for PET imaging.

Left to right: Larry Pitt, Suzanne Kitten, Jason Kitten
Not pictured: Rob Dye, Wayne Taylor

The LANL team working on the recycling process saw its potential for commercial production. As a result of their initiative, MIL was incorporated in New Mexico in 2009. The LANL Technology Transfer Division granted an exclusive license for the Sr-82 recycling process to MIL in 2010. Other awards followed, including a New Mexico Small Business Assistance agreement, and a LANL Venture Acceleration Fund (VAF), enabling the development and certification of a facility, as well as the verification and validation of the recycling process.

Contact: Jason Kitten • (806) 745-3300 • jkmanisotech@gmail.com

Development of a Platinum-Chromium Alloy for Improved Coronary Stents

Coronary stents save thousands of lives each year by providing a structural support to reopen blocked or restricted arteries and allowing blood to recirculate to cardiac tissue. A major limitation of current stents is radiopacity—the lack of visibility in x-rays—which makes it difficult to see the stent for proper placement. The platinum-chromium alloy, developed at National Energy Technology Laboratory (NETL), is a stainless steel formulation with a significant concentration of a highly radiopaque element (platinum) that makes it easier for coronary specialists to see the stent in the catheter during insertion, placement, and expansion. This alloy also increases the stent's corrosive resistance, strength, and flexibility—all of which offer positive benefits to patients and cardiovascular surgeons.

Left to right: Edward Argetsinger, Paul Jablonski, Paul Turner

Scientists from NETL worked closely with their counterparts from commercialization partner, Boston Scientific Corporation, to perform innovative alloy formulation and primary material process development. Boston Scientific utilized the improved alloy performance to develop new coronary stent products with superior properties compared to existing stainless steel stents.

After a lengthy series of clinical trials, Boston Scientific received foreign regulatory market approval in November 2009, and the new coronary stents were marketed as the PROMUS® ELEMENT™ in Europe and the rest of the world. Boston Scientific's stents have gained a 45-percent market share using the alloy, and the company plans to use it exclusively in all of its stents. In early 2011, market approval was received from U.S. and Canadian regulatory agencies. In North America, the stents are marketed under the ION™ brand name. Global sales since market entry have exceeded $1 billion, and the stent will soon be sold in China, which is the largest stent market in the world. *R&D Magazine* recognized the team's effort by selecting them as a winner of the 2011 R&D 100 Award.

Contact: Paul Turner • (541) 967-5863 • paul.turner@netl.doe.gov

Materials for a Low-Cost, Clean Cookstove

According to the World Health Organization, toxic fumes from traditional cookstoves and open fires cause the premature deaths of nearly 2 million people worldwide every year. Further, these emissions are estimated to account for discharge of up to one-third of the world's black carbon, which has been implicated as a significant contributor to global warming.

Envirofit International is a U.S. tax-exempt, nonprofit corporation that manufactures low-cost, clean cookstoves for the developing world. The company has developed and implemented new combustion chamber technology that significantly reduces emissions and improves efficiency. Its initial cookstove product utilized a ceramic combustion chamber. Although successful, the ceramic material limited future design options for further reductions in emissions. The fragility of ceramics also led to a shorter product life, and complicated the transportation and delivery of cookstoves to remote areas in the developing world due to component breakage. Envirofit contacted Oak Ridge National Laboratory (ORNL) in 2007 for assistance selecting low-cost metal alloys capable of surviving the harsh, high-temperature and highly corrosive conditions encountered in cookstove combustion chambers. Several technology transfer mechanisms were used by ORNL to assist Envirofit. ORNL was able to quickly provide materials selection guidance by leveraging extensive past experience in high-temperature materials gained under Department of Energy programs. This effort resulted in a joint U.S. patent application among Envirofit, Colorado State University (which provided research and development services to Envirofit), and ORNL.

Ongoing materials characterization studies by ORNL are being used to provide guidance for specifying and optimizing acceptable alloy composition ranges and impurity levels to achieve the lowest cost material that also meets durability requirements. Envirofit's G-3300 cookstove, utilizing the metal combustion chamber, was successfully launched in the summer of 2009. The G-3300 has been demonstrated to reduce smoke and harmful gases by up to 80%, reduce fuel use by up to 60%, and reduce cooking time by up to 50% compared with traditional cooking fires and stoves. The core technology developed for the G-3300 has now been integrated across six models of wood and charcoal stoves. To date, more than 150,000 units have been sold in the developing world.

Top left to right: Alex DeTrana, Tim Theiss, Nathan Lorenz, Michael Brady, Joe Marasco, Larry Walker
Bottom left to right: David Stinton, Jesse Walker, Dr. Tom Roseel, Frank Damiano, Dr. Brian Wilson, Dr. Morgan DeFoort

Contact: Dr. Michael Brady • (865) 574-5153 • bradymp@ornl.gov

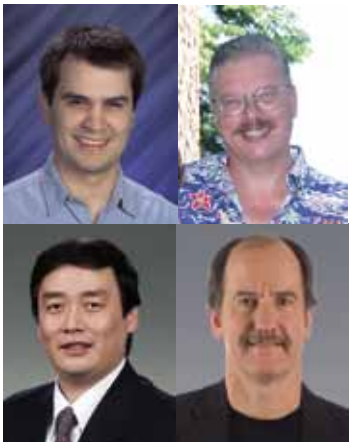
Chemically Etched Emitters for Nanoelectrospray Ionization Mass Spectrometry

Electrospray ionization-mass spectrometry (ESI-MS) has become an invaluable tool for chemical and biological research due to its high sensitivity and straightforward online coupling with liquid-phase separations. In 2005, researchers at Pacific Northwest National Laboratory (PNNL) developed a process for creating nanoelectrospray emitters used in the ionization process of mass spectrometry. These emitters enabled greatly improved stability, reproducibility, and longevity.

In 2009, representatives from Michrom Bioresources, Inc., were eager to sell its new CaptiveSpray™ source to the mass spectrometry facility at PNNL and sent a demo unit. PNNL researchers were impressed upon evaluating the product, but felt their emitter etching technology could improve it. Subsequently, a batch of etched emitters was sent to Michrom for testing at its facility and several customer sites.

Both Michrom and its customers were immediately pleased with the etched emitters' sensitivity, stability, and consistency. The company approached PNNL about licensing the technology, and a nonexclusive license was executed in August 2010. In parallel, Michrom requested that PNNL manufacture an initial batch of emitters to rapidly enable new product introduction. However, as a national research laboratory, PNNL was not in a position to act as a contract manufacturer.

PNNL researchers realized that the best way to assist Michrom and facilitate a technology transfer was to quickly help them become proficient in fabricating the etched emitters. Sending the primary inventor, Dr. Ryan Kelly, to Michrom's Auburn, Calif., facility would be the most effective means to transfer critical knowledge to Michrom staff; however, a way to fund this needed to be found. Michrom applied for project funding through PNNL's Technology Assistance Program (TAP); this was quickly approved and the visit ensued. Within days of Dr. Kelly's visit, Michrom staff had institutionalized the fabrication process.



Top left to right: Dr. Ryan Kelly, Kelly Nugent
Bottom left to right: Dr. Keqi Tang, Bruce Harrer

In October 2010, Michrom began selling its new emitter tips. In February 2011, Michrom was acquired by a global scientific instrumentation company, Bruker Corporation. This acquisition should further expand the benefits of the emitter tip technology transfer to the mass spectrometry community.

Contact: Dr. Ryan Kelly • (509) 371-6525 • ryan.kelly@pnnl.gov

DEPARTMENT OF ENERGY
Sandia National Laboratories

Fuel Cell Mobile Light

The fuel cell mobile light is bringing clean hydrogen fuel cell lighting products to industry. By doing so, Sandia National Laboratories (SNL) is helping the U.S. to reduce diesel and greenhouse gas emissions, and lower dependence on foreign oil. In its design, the fuel cell mobile light features a quiet, zero emissions fuel cell to replace the noisy diesel-powered generators that provide energy for mobile lights used by highway construction crews, airport maintenance personnel, film crews, and many others.

Transfer of the technology was initiated as part of an SNL/Boeing umbrella Cooperative Research and Development Agreement, and a strategic partnership that included an innovative coalition of funding sponsors, fuel cell and lighting technology experts, equipment manufacturers, and diverse end-users. This coalition has led to a commercial product that promotes the Department of Energy goal of bringing clean fuel cell technology to the marketplace in new applications, and it also furthers Boeing's desire to bring fuel cell technology to aviation.

An Intellectual Property Management Plan transferred the technology to commercial partner, Multiquip, Inc., a leading manufacturer of rental construction equipment in the U.S. While Multiquip is the main recipient of the technology transfer from SNL, all of the project coalition members have been sharing knowledge and technology. SNL has been guiding and facilitating this technology transfer throughout the life of the project.

A successful transfer has been realized with the rollout of the H2LT (H2 Light Tower). Multiquip has already received 30 preorders for the H2LT, which became available in early 2012. Airlines and airports will also have commercially manufactured H2LT units available to use as airport ground support equipment, reducing emissions at airports and supporting the Boeing goal of introducing fuel cell technology to aviation.

SNL will continue to work on advanced designs, such as a "Hybrid System" that uses metal hydride storage of hydrogen to improve on the high-pressure storage of hydrogen used on the current H2LT product. In addition, SNL will supervise the current deployment of the H2LT technology with a number of field-test partners, including Paramount Pictures, NASA's Kennedy Space Center, the California Department of Transportation, and San Francisco International Airport.

Left to right: Joe Breit, Dr. Tom Damberger, Torsten Erbel, Dr. Lennie Klebanoff, Chris Radley, Gerald Rea, Russ Sanders
Not pictured: Nico Bouwkamp, Geoff Brown, Dr. Ben Chao, Bruce Coleman, Robert Drake, Bill Elrick, Derek Fliess, Jennifer Hamilton, Roger Hooson, Terry Johnson, Mickey Oros, Steve Prey, George Roe, Candace Saunders, Thomas Skradski, Dr. Steve Velinsky, Wil White, Steve Wingert, Randy Woolley, Michael Zelinsky

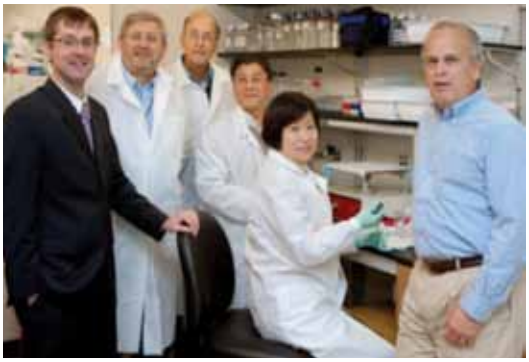
Contact: Dr. Lennie Klebanoff • (925) 294-3471 • lekleba@sandia.gov

Heat-Inactivated Rotavirus Vaccine

Rotavirus is the single most important cause of severe diarrhea among children throughout the world, and it is responsible for millions of hospitalizations and an estimated 527,000 deaths per year, with 85% of these deaths occurring in developing countries. While live oral rotavirus vaccines have demonstrated good efficacy against severe rotavirus diarrhea in clinical trials conducted in the Americas and Europe, data on the efficacy in developing countries has raised concern about efficacy in resource-limited settings, where an effective vaccine is needed most.

Over the past decade, Centers for Disease Control and Prevention (CDC) scientists have been conducting research and development on an inactivated rotavirus vaccine as an alternative to the live oral rotavirus vaccines. To produce an inactivated rotavirus vaccine, CDC entered into a Cooperative Research and Development Agreement (CRADA) with Sanofi Pasteur. Under this successful collaboration, CDC scientists identified new and improved methods to inactivate rotavirus. This novel approach used heat inactivation instead of the more common chemical inactivation methods. Compared to chemical methods, the CDC method is rapid, simple, maintains the integrity of the virus particles, and preserves their antigenicity.

Over the past few years, CDC has entered into patent license agreements with five Chinese vaccine manufacturers (two evaluation licenses and three full commercial licenses), one Indian vaccine manufacturer, and one company in Vietnam. In addition, CDC has signed evaluation agreements with three domestic companies to evaluate CDC's technology as part of their potential vaccine pipelines.



Left to right: Dr. Donald Prather, Dr. Jon Gentsch, Dr. Roger Glass, Dr. Baoming Jiang, Yuhuan Wang, Francisco Candal

Through the continued efforts of CDC laboratory scientists, technology transfer professionals and private sector partners, this inactivated rotavirus vaccine will alleviate the morbidity and mortality associated with rotavirus. With rotavirus the primary cause of severe diarrhea among children throughout the world, this vaccine will substantially reduce the millions of hospitalizations and the estimated 527,000 deaths per year due to rotavirus infections.

Contact: Dr. Baoming Jiang • (404) 639-2861 • bjiang@cdc.gov

An Interactive Software Package for the Analysis of Microarray Data

The emergence of bioinformatics tools, which integrate molecular biology and genomics with computer-based information technology, is bringing about a revolution in our understanding of the molecular mechanisms underlying normal and dysfunctional biological processes. The microarray is one such tool that caused a paradigm shift in how researchers collect and analyze genetic data. Microarrays allow researchers to monitor the whole genome in a single experiment, thus enabling researchers to obtain a picture of the complex and orchestrated interactions that exist among thousands of genes simultaneously.

Since many biologists are not trained in computer programming and statistical analysis, they often have difficulty translating microarray data into meaningful biological conclusions. To address this need, a team at the National Cancer Institute's (NCI) Biometric Research Branch (BRB) invented a comprehensive desktop software package. The software performs sophisticated and powerful calculations that allow scientists to analyze their microarray data by discovering biologically significant patterns in gene expression data. The package, known as BRB-Array Tools, is widely recognized as the most statistically sound package available for the analysis of microarray data.

Left to right: Michael Shmilovich, Dr. Richard Simon
Not pictured: Robert Wagner

BRB-Array Tools has been transferred using mechanisms designed to facilitate broad dissemination of the software to a variety of users. To accomplish this goal in the most effective manner, a model for distribution was developed and implemented whereby the software could be downloaded from the BRB site at no cost to users from academic and nonprofit institutions, and to commercial users for a reasonable, one-time fee.

This technology transfer effort represents a successful experiment in providing researchers with powerful tools to analyze complex information in the most efficient manner possible. BRB-Array Tools has been the subject of over 13,000 Software Transfer Agreements to government agencies, universities, and research institutions in 66 countries, as well as 35 nonexclusive licenses to commercial entities.

Contact: Dr. Richard Simon • (301) 496-0975 • rsimon@mail.nih.gov

Development of Eribulin, a Potent Anti-cancer Agent, From a Marine Sponge

Natural products have formed the basis of traditional medicine systems for thousands of years and have been the single most productive source of leads for the development of cancer drugs. Halichondrin B is a compound isolated from a species of marine sponge, used for pre-clinical and clinical research and development of a related synthetic compound into the novel cancer drug Eribulin.

Left to right: Dr. David Newman, Dr. Sherry Ansher

After halichondrin B was isolated by Japanese scientists from Eisai, Inc. in 1986, the National Cancer Institute (NCI) accepted the compound for initial preclinical testing and made it the original test case for the NCI 60 cell line screen. During this testing, halichondrin B's unique mechanism of action as a microtubule destabilizer was demonstrated.

Realizing the compound had tremendous potential as an anti-cancer agent, NCI began to explore methods to generate sufficient quantities for further preclinical and clinical testing. A Letter of Collection was put into place between NCI and the New Zealand government to harvest the species of sponge that yields halichondrin B. After discovering that one metric ton of sponges would yield only 300 mg of the compound, it became clear that the development of synthetic analogs would be the most viable option for further development of the compound. Supported by grants from NCI, Harvard researchers developed synthetic methods and licensed the synthetic methodologies and patents to Eisai, which subsequently developed many synthetic analogs to halichondrin B.

Studies demonstrated that the synthetic analogs were as safe and effective as the parent, and provided strong rationale for the product's continued development. In 2004, Eisai and NCI entered into a clinical trials Cooperative Research and Development Agreement (CRADA) to finalize pre-clinical studies and initiate early phase 1 clinical trials in patients with cancer. These studies resulted in FDA priority approval of Eribulin in 2010 for the treatment of patients with metastatic breast cancer. This technology transfer effort has been of critical importance as there are limited treatment options for women with aggressive forms of late-stage breast cancer who have already received other therapies. The CRADA term was extended, and the parties currently have plans to explore development of the synthetic analog of halichondrin B for treatment of other types of tumors.

Contact: Dr. Sherry Ansher • (301) 496-7912 • anshers@ctep.nci.nih.gov

Use of Therapeutic Antibodies as a Novel Treatment for Multiple Sclerosis

Multiple sclerosis (MS) is a disease of the central nervous system in which the immune system attacks the brain and spinal cord, typically resulting in muscle weakness, problems with vision and coordination, pain and, in some patients, cognitive impairments. The disorder affects approximately 400,000 people in the U.S. and more than 2.5 million people worldwide. Patients with relapsing forms of MS are currently treated with one of three FDA-approved interferon-beta agents or with glatiramer acetate. Unfortunately, these treatments are not effective in a substantial number of patients; therefore, there is an urgent need to develop new and more effective treatments for MS.

A team from the National Institute of Neurological Disorders and Stroke (NINDS) discovered that daclizumab, a humanized antibody to the interleukin-2 receptor alpha chain (IL-2Rα), is effective in treating MS. Daclizumab was first developed and approved in the U.S. for preventing organ transplant rejection. A team at the National Institutes of Health (NIH) led a small clinical trial of patients with MS who did not respond to interferon-beta alone and found that adding daclizumab improved patient outcome. Patients who received the combined therapy had a 78-percent reduction in new brain lesions and a 70-percent reduction in total lesions, along with other significant clinical improvements. Daclizumab was also tolerated very well. Based on this trial, the NIH team anticipated that daclizumab and other anti-IL-2Rα antibodies would be useful either as combination therapy or stand-alone treatment.

The technology is exclusively licensed to Abbott (formerly Facet Biotech/PDL), which in collaboration with Biogen Idec has initiated and is currently enrolling patients for a Phase III study. The licensee recently concluded a study that enrolled 230 patients with MS that confirmed using daclizumab as an add-on therapy helped patients whose symptoms had relapsed while they were taking interferon-beta. Several other small-scale clinical trials at NIH have led to the conclusion that daclizumab monotherapy is effective in most patients who experienced persistent MS disease activity with interferon-beta therapy. While the NINDS team helped transfer this technology from bench to bedside by conducting clinical trials and disseminating the results of their findings, the technology transfer professionals at NIH transferred this valuable technology to biopharmaceutical companies to ensure that FDA-approved therapies are developed that can further help in treating MS worldwide.

Team members: Dr. Surekha Vathyam, Dr. Bibiana Bielekova, Dr. Roland Martin, Dr. Henry McFarland, Dr. Thomas Waldmann, Dr. Melissa Maderia, Dr. Martha Lubey, Dr. Charlotte McGuinness, Thomas Clouse, Mojdeh Bahar, Richard Rodriguez

Contact: Dr. Surekha Vathyam • (301) 435-4076 • vathyams@mail.nih.gov

Vibro-Tactile Stimulation Device and Method for Swallowing Disorders

The Vibro-Tactile Stimulation Device is a noninvasive, intensive, swallowing retraining device that combines sensory stimulation with motor retraining to rehabilitate swallow function, initially targeted for dysphagia patients. Dysphagia is a common disorder that creates difficulty swallowing. Patients at risk of choking on fluid or food face the risk of life-threatening aspiration pneumonia and may need to be fed through a tube. Dysphagia may occur as a result of stroke, brain injury, tumor removal, or neurodegenerative disease.

The overall purpose of the technology is to provide a new system for daily self-training of swallowing that is less costly and potentially more effective than options currently available. The device triggers the reflexive component of swallowing synchronous with volitional retraining throughout the day in a patient's own environment. This can augment or replace current approaches to rehabilitation that depend on the patient having access to speech pathologists for a limited intervention of only a few hours a week.

The Vibro-Tactile Stimulation Device was licensed to Passy-Muir, Inc., a small, privately owned company based in Irvine, Calif., with a worldwide reputation for the delivery of high quality medical devices for voice and swallowing. Its product line includes non-mechanical swallowing and speaking valves for adults and children. Passy-Muir was granted rights to the technology under an exclusive license with the National Institutes of Health.

Team members: Heather Gunas, Dr. Christy Ludlow, Laurie Arrants, Michael Shmilovich, Dr. Susan Ano

Contact: Heather Gunas • (301) 496-0477 • gunash@mail.nih.gov

Stretched Lens Array: Ultra-Light, Affordable Green Energy Technology

The Stretched Lens Array (SLA) is a high-performance, ultra-light solar concentrator for space and grid-scale power applications. Developed through multiple funding source contracts with Entech® Solar, Inc., in partnership with NASA's Glenn Research Center, the innovation employs a thin film lens to concentrate a large area of sunlight onto a small area of photovoltaic (PV) cells. In space, this record-breaking technology has been optimized for the best performance, reliability, and efficiency through NASA's award-winning space demonstration on Deep Space 1, a highly successful asteroid/comet rendezvous mission and the first space mission to be powered by triple-junction cells. On the ground, it is now being used with the commercial launch of Entech Solar's new terrestrial product, the SolarVolt™ module. The SolarVolt™ module uses a thin 20X concentrator over simple crystalline silicon PV cells, resulting in a high efficiency, yet low-cost solar panel.

This technology transfer effort is unique in that it has benefitted both NASA and Entech Solar through a "round-trip" innovation process. Entech Solar's terrestrial solar power concentrator was spun into a space concentrator in the 1980s. Nearly 30 years later, the company's SolarVolt™ module is a new solar concentrator that is a direct spinoff from the space technology. The roots of the technology transfer are in NASA's Small Business Innovation Research and Small Business Technology Transfer programs, but transfer efforts over three decades have grown to include numerous other contracts

Left to right: Michael Piszczor, Mark O'Neill, Almus McDanal

at Glenn and other NASA centers. The NASA Glenn team devised innovative and creative ways to test the SLA innovation for performance, from specialized testing in thermal and radiation environments; to performance evaluation under space conditions using the Glenn Lear Jet solar cell calibration facility; and high voltage experiments conducted on the peaks of Mt. Haleakala in Hawaii.

Entech Solar has developed and patented multiple advancements in the solar concentrator arena. Green energy U.S.-based jobs will be created as Entech Solar commercializes the SolarVolt™ module and implements its 2012 mass production plan. At Glenn, collaborative work continues, as innovators work with Entech Solar and other firms to support the emerging in-space transportation market. In journeying from the Earth to space and back again, the super-efficient SLA concentrator technology will enable future NASA missions, further the commercial development of space, and provide environmentally renewable energy to utility-scale power plants.

Contact: Mike Piszczor • (216) 433-2237 • michael.f.piszczor@nasa.gov

EVALUATOR PANEL
Awards for Excellence in Technology Transfer

Representing a cross-section of federal laboratories, industry and academia, the members of the Evaluator Panel enthusiastically devoted their time and effort to judging the dozens of nominations submitted for the Awards for Excellence in Technology Transfer. Selecting the winning technologies was a difficult task, but these evaluators admirably rose to the challenge. The FLC recognizes their tireless efforts and expresses its gratitude.

Tom Anyos
Technology Ventures Corp.

Dr. Krishna Balakrishnan
National Institutes of Health

Dr. Sudeep Basu
Frost & Sullivan

Cordell Benton
NNSA Kansas City Plant

Ryan Besand
NNSA Kansas City Plant

Dr. Keith Bupp
National Cancer Institute

Kyle Byers
NNSA Kansas City Plant

Steven Ferguson
National Institutes of Health

Dr. Suzanne Frisbie
National Institute of Allergy and Infectious Diseases

James Genovese
U.S. Army Edgewood Chemical Biological Center

Marcia Graeff
TechLink

Nicholas Karvonides
Institute for Defense Analyses

Mark Langguth
Argonne National Laboratory

Andrew Loebl
Oak Ridge National Laboratory

Dr. Eric Lund
Pacific Northwest National Laboratory

Duncan McKinley
U.S. Forest Service

Susan McRae
Army Space & Missile Defense Command

Tod Neidt
NNSA Kansas City Plant

Dr. Mariappan Paranthaman
Oak Ridge National Laboratory

Keith Quinn
Air Force Research Laboratory - Propulsion Directorate

Linda Schilling
National Cancer Institute

Joe Sciabica
Air Force Research Laboratory

Johnette Shockley
Army ERDC Cold Regions Research and Engineering

Dr. Courtney Silverthorn
SAIC-Frederick, Inc./ National Cancer Institute at Frederick

Jessica Sosenko
National Energy Technology Laboratory

Dr. Herbert Spiegel
Applied Science & Technology Associates, Inc.

Larry Steele
Skymetrics, Inc.

Janet Stockhausen
Forest Products Laboratory

Kathryn Townsend
Naval Meteorology and Oceanography Command

Tim Wittig
Technology Management Advisors - SAIC

Individual and Team Awards

INTERAGENCY PARTNERSHIP AWARD

DEPARTMENT OF DEFENSE – NAVY
Naval Sea Systems Command
Naval Surface Warfare Center, Carderock Division

DEPARTMENT OF ENERGY
Pacific Northwest National Laboratory

Pacific Northwest NATIONAL LABORATORY
Proudly Operated by Battelle *Since 1965*

Self-Assembled Monolayers on Mesoporous Supports (SAMMS®) technology is part of a new class of hybrid nanoporous materials. These materials are typically comprised of highly porous silica decorated with molecular monolayers custom-designed to target and capture specific contaminants or trace components. When first developed by researchers at Pacific Northwest National Laboratory (PNNL) in the 1990s, SAMMS technology was found to have the capability to rapidly capture contaminants such as mercury, silver, cadmium, copper, and lead from aqueous environments. SAMMS material binds with the targeted contaminants, removing and recovering them without creating secondary waste.

Existing carbon dioxide (CO2) removal techniques involve contacting the CO2-laden air with an air scrubber using a liquid monoethanol amine (MEA) solution. MEA, in use aboard

Left to right: Robin Benzel, Wah Lee, John Segelhorst, Patrick Tyler, Tracy Shadle, Rich Hagar, CDR John Vlattas

Contact: Cheryl Cejka • (509) 375-3700 • cheryl.cejka@pnl.gov

submarines for over half a century for atmospheric control, is bulky, heavy, corrosive, malodorous, and has a limited lifespan—serious and long-standing issues the Navy was highly motivated to solve. In order to support the Naval Surface Warfare Center Carderock Division's (NSWCCD) mission of new technology acquisition, PNNL investigated atmosphere control technologies that were available for leveraging for use by the U.S. Navy. Through early and persistent petitioning on behalf of the SAMMS technology, PNNL was able to secure funding through the Office of Naval Research to evaluate the SAMMS technology for efficacy of CO2 removal for use in submarine atmosphere control. Significant input was provided by PNNL and the Naval Sea Systems Command (NAVSEA).

NSWCCD has established plans to deploy the first full-scale SAMMS-based breathing air sanitation units in the Virginia class submarine fleet. The class consists of 12 nuclear-powered fast attack submarines designed for a broad spectrum of open-ocean and littoral missions. Other classes currently under consideration for subsequent deployment (retrofit) of this technology include the Ohio (18 in service), Seawolf (3 in service), and Los Angeles (43 in service) classes.

Researchers at PNNL are also currently exploring its potential fit with technology needs at NASA (breathing air for extravehicular activity [EVA] suits and aboard spacecraft such as the Orion). Another project under consideration is with the U.S. Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) to reduce the amount of air exchange required in commercial building operation, thereby alleviating associated heating and cooling costs.

Top left to right: Greg Anderson, Audrey Bauer, Ray Bauer, Dustin Caldwell, Dr. April Carman, Dr. Glenn Fryxell
Middle left to right: Richard Hagar, Ben Letter, Dennis Mullen, Ian Peek, Kenneth Rappe, Tracy Shadle
Bottom left to right: Jay Smith, Matt Smith, Jake Tucker, Jesse Willett, Dr. Thomas Zemanian
Not pictured: Edward Ammeen, James Boyd, James Concannon, Roberta Rule

STATE AND LOCAL ECONOMIC DEVELOPMENT AWARD

DEPARTMENT OF ENERGY

Sandia National Laboratories
Sandia Science and Technology Park

The Sandia Science & Technology Park (SS&TP) was conceived as a partnership between Sandia National Laboratories (SNL) and public and private partners. The SS&TP has successfully met the need for technology transfer, increased need for business space near SNL for current and potential industry partners, and added desirable jobs to a state, city and neighborhood where high-paying jobs were sorely lacking. By working with the city of Albuquerque and the state of New Mexico, SNL was able to realize its vision for the creation of a high technology community that continues to grow and thrive.

Since its inception, 31 companies/organizations have moved into the 340-acre SS&TP, with more than 2,200 employees in 20 buildings. Over the years, the SS&TP has steadily grown in international stature and was recognized by the Association of University Research Parks as the 2008 Outstanding Research Park of the Year.

EMCORE was the first company to move into the Park. They have licensed solar cell and transponder technologies from SNL, received industrial revenue bonds from the city to build in the Park, and utilized state job training incentive funds to train employees. A publicly traded company, EMCORE has relocated its corporate headquarters to the SS&TP from out-of-state, and is a thriving company with 400+ employees working in the Park.

The city of Albuquerque and state of New Mexico have seen the positive economic impact the SS&TP has had bringing in successful companies and jobs to the area. To date, there have been 2,284 direct jobs created by entities in the Park, plus 5,441 indirect jobs created, for a total of 7,725 jobs. The cumulative impact on gross receipts tax revenue for the state was $57,519,508 and for the city $8,231,707. Jobs in the SS&TP are high paying, averaging $71,612 compared to the city average of $39,342. Another impact due to the success of the SS&TP is that new investment has been brought into New Mexico. Just recently, Raytheon, a Fortune 200 company, and Air Products, a Fortune 300 company, have acquired businesses located in the Park.

Team members: Jackie Kerby Moore, John Garcia, Deirdre Firth, Jon Barela

STEM AWARD

Ricardo Negron

DEPARTMENT OF DEFENSE – AIR FORCE

Air Force Research Laboratory

Ricardo Negron is Chief of the Domestic Partnering Branch of the Air Force Research Laboratory (AFRL) and head of all AFRL science, technology, engineering, and mathematics (STEM) education activities. Since 2006, he has pioneered innovative applications of federal statutes to forge tactical STEM partnerships, played a critical role in developing an outreach network that founded and maintains the Dayton Regional STEM School and the Dayton Regional STEM Center, secured more than $7 million to fund STEM programs, and been designated as the STEM outreach coordinator for the entire U.S. Air Force.

Relying on his previous STEM experience and extensive outreach network, Negron co-founded EDvention, a not-for-profit whose mission was to develop the STEM talent needed to propel regional growth. Negron's grassroots role in EDvention presented another opportunity in 2007 when the Ohio legislature allotted funds for five STEM schools. Negron determined that the technology transfer statutes would allow AFRL to serve as the school's technology partner. He then assisted partners Wright State University (WSU) and EDvention with a proposal to locate one of the schools in the Dayton region.

The Dayton Regional STEM School opened its doors to a class of 92 ninth graders in August 2009. Negron helped develop a funding strategy to ensure the school's long-term viability. He has also taken an active role in the staffing and continued growth of the school. In 2010, the school expanded to serve grades 8, 9, and 10. In fall 2011, only two years into its existence, the school moved to a larger location to accommodate the expanding enrollment in grades 7-11. The program is on track to offer a full combined middle school and high school campus, grades 6-12, next fall, and will graduate its first class of seniors in spring 2013.

The Dayton STEM Center's approach to collaborative curriculum development and professional training sets it well apart from traditional piecemeal STEM education. The curriculum is created by STEM Fellows, who include AFRL scientists and engineers, higher education professors, teachers from grades K-12, and industry scientists who work together to create inquiry-based, project-based lessons that encourage students to struggle, explore, and experiment with solutions. In the first year, nearly 70 lessons were created to national and international academic standards, hundreds of teachers honed their skills in STEM training workshops, and several dozen principals and superintendents participated in STEM overview sessions. The program was off and running to rave reviews and excellent educator feedback, and more than 11,000 students were impacted by the STEM Center's activities.

Contact: Ricardo Negron • (937) 255-6793 • ricardo.negron@wpafb.af.mil

ROOKIE OF THE YEAR AWARD

Holly Victorson

DEPARTMENT OF DEFENSE – AIR FORCE

Air Force Research Laboratory, Space Vehicles Directorate

Holly Victorson has demonstrated exceptional service performing technology transfer at the Phillips Research Site (PRS) of the Air Force Research Laboratory (AFRL). With less than one year of technology transfer experience, she assumed the lead position of the joint Office of Research and Technology Applications (ORTA) for the Directed Energy and Space Vehicles Directorates in 2010, and has led a diverse team of contractors from industry and academia to increasing successes for AFRL in the areas of technology transfer and STEM (science, technology, engineering, and mathematics) outreach.

Victorson has been the driving force behind some of the most creative and cutting-edge technology transfer activities at PRS. In 2011 she conceived, led, and enabled the award of a first-of-a-kind "collaborative activity ability" through a Partnership Intermediary Agreement with New Mexico Institute of Mining and Technology. This innovative technology transfer method was seized by AFRL scientists and engineers immediately upon its creation, and the first collaborative event was held in September 2011 when the Space Vehicles Directorate formed a board of high-level satellite design experts from state and local governments, academia, and the private sector to assist with formulating a sound maturation and transition plan for the Space Plug and Play Architecture technology.

Victorson utilized tech transfer mechanisms to create and expand the Advanced Sciences and Technology Research Institute for Astrodynamics (ASTRIA), an institute consisting of 15 university education partnerships spanning research areas in four AFRL directorates. Additionally, when the legal authority that allows AFRL to perform K-12 STEM activities through the AFRL La Luz Academy came into question, Victorson independently developed four different legal paths that would allow the continued performance of the La Luz mission. Without her analysis and tireless advocacy for STEM outreach, the AFRL La Luz Academy, a program named by the Secretary of the Air Force as a flagship STEM program, would have had to cancel all FY11 student flights, a move that would affect more than 5,000 students.

Even while Victorson has pursued innovative and creative solutions for technology transfer and STEM outreach at PRS, she has also served as the lead ORTA for two AFRL directorates. Under her leadership, the number of active Cooperative Research and Development Agreements at PRS increased over 11 percent. Education Partnership Agreements have also accelerated due to the increasing reach of the AFRL La Luz Academy. All the while, she trimmed the overall budget for the technology transfer office from $883K in FY09 to $521K in FY11, a reduction of more than 40 percent—funds that go directly back to the cutting-edge research performed at the directorates.

Contact: Holly Victorson • (505) 382-2606 • holly.victorson@kirtland.af.mil

OUTSTANDING TECHNOLOGY TRANSFER PROFESSIONAL AWARD

Dr. Charles Schlagel

DEPARTMENT OF DEFENSE – NAVY

Naval Medical Research Laboratory

From 1999 to his retirement in 2011, Dr. Charles J. Schlagel served as the first Director of the Office of Technology Transfer (OTT) at the Naval Medical Research Center (NMRC). In this role, he brought energetic, goal-driven leadership to Navy technology transfer efforts after his previous career in the Naval Medical Service Corps. He skillfully promoted and oversaw technology transfer at some of the nation's most prolific research institutions, including the NMRC, the Naval Health Research Center, and the Naval Medical Centers in Bethesda, Md., Portsmouth, Va., and San Diego, Calif. His support of technology transfer efforts at NMRC included three overseas detachments in Cairo, Egypt; Lima, Peru; and Southeast Asia.

Thoroughly familiar with both basic research and real-world potential through his background in biomedical research, Dr. Schlagel quickly invigorated technology transfer within the Navy medical system. He developed a comprehensive strategic plan for the NMRC OTT, including plans for expansion. Dr. Schlagel reviewed and assisted in negotiating all Cooperative Research and Development Agreements and Patent License Agreements for the entire Navy medical system, resulting in a dramatic increase in Navy technology transfer partnerships with industry and significantly improving the Navy medical system's ability to accomplish its mission. His highly effective efforts to maximize technology transfer in the U.S. Navy were recognized in 2004, when he received the Department of Defense's first annual George F. Linsteadt Technology Transfer Achievement Award.

Dr. Schlagel has had remarkable success building partnerships between some of the nation's best medical researchers and entrepreneurial companies anxious to market Navy innovations to both military and civilian customers. An active member of the Licensing Executives Society, he regularly attended meetings with biomedical and pharmaceutical industry representatives. In April 2011 he represented Navy technology transfer efforts at the World Vaccine Congress attended by key stakeholders in the vaccine market, and met with specific private industry and government groups before, during, and after the event. His mediation skills and collaborative technology transfer philosophy were responsible for a growing tradition of rewarding teamwork between the Navy and industry. He facilitated the transfer of high-impact products across the medical spectrum, including a reduced oxygen breathing device that simulates hypoxic conditions for mask-wearing users to facilitate high altitude flight training and research at relatively low cost and risk; a "hearing aid" technology that allows the wearer to detect whether radar is sweeping the area; and a "hearing pill" that uses amino acide N-acetylcysteine to help protect, and even repair, inner ear cells against damage.

LABORATORY DIRECTOR OF THE YEAR

Dr. Samuel Aronson

DEPARTMENT OF ENERGY

Brookhaven National Laboratory

Brookhaven National Laboratory (BNL) has a long history of transferring technology developed from fundamental science to the private sector. From video games through maglev trains to medical imaging, BNL's innovations have had an enduring and worldwide impact. Under Dr. Samuel Aronson's leadership, an expanded focus on moving from discovery to deployment has broadened and intensified this impact.

With a rich history of inventions under Dr. Aronson's leadership, an emerging aspect of BNL's science and technology agenda focuses on research at the gap between basic and applied science to provide an environment where research innovations may be developed to the point of being deployed more rapidly. The BNL effort is taking full advantage of Work for Others, Cooperative Research and Development Agreements, and intellectual property licensing to engage with the eventual users of technology. The laboratory has already established partnerships with industry to pursue the commercialization of some of its climate- and energy-related applications, and has plans to expand the deployment side of its accelerator science and technology core capability.

Dr. Aronson has provided strong leadership for technology-based entrepreneurship on several levels. In collaboration with the Small Business Development Center at Stony Brook University, BNL has developed a series of educational workshops for lab employees and local residents. To further expand the laboratory's ability to transfer technology to startups, Dr. Aronson supported development of a formal policy by which Brookhaven Science Associates (BSA), the contractor operating BNL, can take equity as partial consideration for licenses to BNL technology.

New York Governor Andrew Cuomo appointed Dr. Aronson, along with other distinguished local leaders, to the new Long Island Regional Economic Development Council (LIREDC). The Council has worked at a rapid pace to develop an economic development strategic plan and associated regional projects. Through Dr. Aronson's efforts, BNL is playing important roles in developing the regional strategy and project plans in innovation and industry as well as education and workforce development. Dr. Aronson has made significant contributions to the overall enhancement of technology transfer at BNL that are leading to improved economic development at the lab—and more broadly on Long Island and in New York State.

Contact: Dr. Samuel Aronson • (631) 344-2772 • samaronson@bnl.gov

LABORATORY DIRECTOR OF THE YEAR

Douglas Bowers

DEPARTMENT OF DEFENSE – AIR FORCE

Air Force Research Laboratory, Propulsion Directorate

Since becoming Director of the Air Force Research Laboratory (AFRL) Propulsion Directorate in 2008, Douglas Bowers has provided unwavering support for the Directorate's technology transfer program. He works tirelessly to close the gaps in overall technology developments, and has implemented new programs and procedures that empower Directorate personnel to pioneer innovative uses of technology transfer to accomplish the lab's broad mission. Bowers' management style motivates a spirit of entrepreneurship that encourages responsibility and accountability at all levels of operation.

Bowers is responsible for $3 billion in propulsion and power research facilities at the Wright-Patterson and Edwards AFB sites, where he leads a workforce of more than 1,000 people and oversees an annual budget of $400 million. He entered federal service in 1972 as a project engineer in the Flight Dynamic Laboratory (now Air Vehicles Directorate). Bowers served in a variety of senior technical positions in the Air Force, and has been a technical consultant on a number of aircraft development programs. As a division chief, he led all aspects of the technical and administrative program for development of breakthrough aerodynamic components that enhance warfighter capability. This background has given him insights and skills that translate directly into effective and perceptive leadership for the Propulsion Directorate.

Throughout his tenure as director, Bowers has been a major, proactive advocate for the Propulsion Directorate's technology transfer program. One of his first actions after becoming Director was to partner with a local organization, the Wright Brothers Institute (WBI), to assist with technology transfer efforts. Specifically, the Directorate engaged WBI to create a strategy for ensuring the development and commercialization of alternative fuels that would lead to national energy security. By summer 2011, two different alternative fuels had been certified for use in both commercial and military aircraft.

In 2012, the Propulsion Directorate will merge with the Air Vehicles Directorate to create the new Aerospace Systems Directorate. In recognition of his tremendous leadership skills, vision and energy, the Air Force has tapped Bowers to head the new organization. Describing himself as a "servant leader," Bowers looks forward to bringing a new sense of entrepreneurship into the Directorate.

Contact: Douglas Bowers • (937) 656-2807 • douglas.bowers@wpafb.af.mil

LABORATORY DIRECTOR OF THE YEAR

Michael Kluse

DEPARTMENT OF ENERGY

Pacific Northwest National Laboratory

Pacific Northwest
NATIONAL LABORATORY
Proudly Operated by Battelle *Since 1965*

Technology transfer has flourished at Pacific Northwest National Laboratory (PNNL) since Michael Kluse took the helm as Laboratory Director in January 2007. Patent activity has kept and exceeded the per capita average among Department of Energy (DOE) laboratories, numerous key licenses have been executed with both small and large companies, major commercialization-focused grants have been secured, and licensing returns to the Laboratory—and their subsequent reinvestment in new commercially promising research—have reached record levels. To top it off, national awards recognizing this level of excellence in transferring breakthrough technologies to industry have been rolling in at a steady rate.

During Kluse's five-year tenure, PNNL has received numerous national commercialization-focused awards, including 16 R&D 100 Awards and 12 FLC Awards for Excellence in Technology Transfer. In late 2010, one of PNNL's most prolific inventors was recognized with *R&D Magazine's* highest honor, Scientist of the Year, a first for a scientist at any DOE laboratory in the awards program's 45-year history.

Under Kluse's leadership, and with his involvement, PNNL played a leadership role in transforming Washington State's multiple, underfunded technology transfer organizations into a single, innovative, statewide, quasi-public organization. This required restructuring several state agencies and independent programs into a single organization that focuses on delivering services with the direct input and involvement of industry partners. To build broad support for this effort, Kluse brought together the state's universities, high tech and business associations, clean energy businesses, and environmental organizations to build a strong coalition for the restructure. The new organization, Innovate Washington, operates as a nonprofit rather than a state program, which allows the organization to partner with and receive funding from a much wider range of partners, including industry, nonprofits, and venture capital partners.

Kluse also uses his leadership position to influence policy. By speaking frequently at major events in the state, region and around the country, he reinforces the message that strategic alignment of research with technology transfer directed at outcomes will yield greater social and economic benefits for our nation.

Contact: Michael Kluse • (509) 375-6600 • mkluse@pnl.gov

REPRESENTATIVE OF THE YEAR AWARD

John Dement

DEPARTMENT OF DEFENSE - NAVY

Naval Surface Warfare Center, Crane Division

John Dement of Naval Surface Warfare Center, Crane Division (NSWC Crane) has been leading the charge for aggressive and progressive technology transfer at his lab and within the FLC under the bold banner of "information and entrepreneurship for all!"

Driven by his determination to illustrate the return-on-investment, quantifiable value of technology transfer, Dement conceived the idea of a study to capture a snapshot of the economic impact of technology transfer activity on the government and the private sector. He submitted a proposal to the Navy, received Navy technology transfer pilot project funding, and wrote a contract with Indiana University's Kelly School of Business to conduct the study. In "The Economic Contribution of the Department of the Navy Technology Transfer Program," Dement dramatically showed that technology transfer agreements with Navy labs create high-wage jobs; enhance local, regional, and federal tax receipts; support small businesses; and stimulate economic development. The FLC Executive Board asked Dement to present his findings at the 2011 national meeting and, as a result, the Departments of Commerce and Energy and the Agricultural Research Service are now considering similar studies for their own programs.

Dement has created and implemented innovative technology transfer methods and strategies, which he has shared and actively promoted throughout the FLC community. These include a focused strategy involving outreach to external partners and intermediaries. In just the last year, Dement has engaged with six Indiana universities and three schools outside the Indiana University system, targeting business and entrepreneurial schools and outreach departments, and implemented eight local Partnership Intermediary Agreements (PIAs), including economic development organizations and incubators. Thanks to his direct efforts, at least 14 new participants from the university, PIA, and industry sectors attended the FLC's 2011 national meeting.

Dement brings energy and attitude to his work for and through the FLC, and is tireless in his efforts to support the organization as broadly as possible. He is both a willing leader and a diligent participant in FLC activities, and his entrepreneurial spirit on technology transfer processes and methods is creating fresh momentum.

Contact: John Dement • (812) 854-4164 • john.dement@navy.mil

HAROLD METCALF AWARD

Victor Chavez

DEPARTMENT OF AGRICULTURE
Agricultural Research Service, North Atlantic Area

Victor Chavez has been active in the FLC for over 20 years, serving in a variety of positions that include Mid-Continent Region Deputy Regional Coordinator; Awards Committee Chair; Member-at-Large; and member of the Program, State and Local Government, and Education and Training committees.

Chavez's participation on various panels, and his involvement as a facilitator and trainer have demonstrated his leadership and support of the FLC. In recent years he has been very active in the FLC Mid-Atlantic Region and has supported the Regional Coordinator's Regional Network and Outreach Initiative. Chavez has also worked closely with the Maryland Technology Development Corporation (TEDCO) in establishing the Northeastern Maryland Rural Agricultural and Business Innovation Forum, which addresses innovations and technological solutions that impact Maryland farmers and agri-business. His activities have been key drivers in the newly established Agricultural Technology Innovation Partnership program.

Chavez's long history of innovation is demonstrated through the Sandia Entrepreneurial Program, which he created while formerly employed at Sandia National Laboratories. This program is unique in that it allows Sandia staff to leave the laboratory, license technology, and create new businesses or expand existing business with new technologies/products, while providing a safety net to the entrepreneurs if the enterprise does not succeed. Chavez assisted over 100 staff members with utilizing this program, and the success rate was over 70 percent.

Another noteworthy outreach and partnering activity Chavez was involved in was the development, implementation, and funding of the New Mexico Small Business Assistance Program. This program required an innovative approach in that Chavez had to influence the New Mexico Legislature to pass legislation and negotiate with the Governor's Office to authorize Sandia National Laboratories to receive $1.8 million in funding, through a tax credit for providing Small Business Technical Assistance; and access to unique user facilities and encourage the transfer of technology. He was also able to subsequently influence the New Mexico Legislature to increase the funding amount to $2.4 million and provide the same capability to Los Alamos National Laboratory at the same funding level. After ten years of successful technology transfer, this program was selected to receive the inaugural FLC State and Local Economic Development Award.

Contact: Victor Chavez • (215) 233-6610 • vic.chavez@ars.usda.gov

Regional Award Winners & Honorable Mention

2011 REGIONAL AWARD WINNERS

The FLC congratulates the following regional award winners who were recognized in 2011.

FAR WEST

Outstanding Commercialization Success

NASA Ames Research Center
"Powder Handling Device for Analytical Instruments"

Idaho National Laboratory
Optisense Network
"How Idaho National Laboratory Developed Technology, an Optical Sensor, and Empowered the Smart Grid"

Jet Propulsion Laboratory
Medical Technologies International, Inc.
"ArterioVision"

Lawrence Livermore National Laboratory
eBioscience
"Commercialization of Glycophorin Cell Lines"

National Energy Technology Laboratory
*"Development of a Platinum-Chromium Alloy for the Manufacture of Improved Coronary Stents"**

Pacific Northwest National Laboratory
"Low Noise Quantum Cascade Laser Current Controller"

Pacific Northwest National Laboratory
Archer Daniels Midland Company
"Propylene Glycol From Renewable Sources"

USDA ARS Carl Hayden Bee Research Center
"HOPGUARD"

USDA ARS Small Grains and Potato Germplasm Laboratory
"ARS Plant-based Trout Diet"

Outstanding Partnership

California Department of Water Resources, NASA Ames Research Center, Jet Propulsion Lab, NASA Marshall Space Flight Center, California State University Monterey Bay, University of Alabama Huntsville
"Water Management in California: A NASA-CDWR Partnership"

Outstanding Technology Development

Idaho National Laboratory
"Impedance Measurement Box"

Lawrence Livermore National Laboratory
"MEMS-Based Adaptive Optics Optical Coherence Tomography"

SPAWAR Systems Center Pacific
"Adaptive Linear Filter"
"Directional Ad Hoc Networking Technology"

Technology Transfer Professional of the Year

Catherine Elizondo
Lawrence Livermore National Laboratory

Laboratory Representative of the Year

Brian Suh
SPAWAR Systems Center Pacific

MID-ATLANTIC

Awards for Excellence in Technology Transfer

National Energy Technology Laboratory
"APECS v2.0 With ANSYS® DesignXplorer™ and ROM Builder"

National Energy Technology Laboratory
"Novel Pyrochlore Catalysts for Hydrocarbon Reforming"

National Energy Technology Laboratory
"Electroplated Mn-Co Coating for Solid Oxide Fuel Cell Interconnects"

National Institute of Neurological Disorders and Stroke
*"Use of Therapeutic Antibodies as a Novel Treatment for Multiple Sclerosis"**

State and Local Economic Development Award

National Institutes of Health, National Institute of Standards and Technology, National Cancer Institute, Department of Energy, NASA Langley Research Center

STEM Award

NASA Goddard Space Flight Center
"NASA OPTIMUS PRIME Spinoff Award"

NASA Goddard Space Flight Center
"Massively Multiplayer Online Educational Game"

Educational Institution and Federal Laboratory Partnership Award

USDA Agricultural Research Service, The Pennsylvania State University, Virginia Polytechnic Institute and State University, University of Maryland Eastern Shore, University of Maryland, Cornell University, University of Delaware, University of Maryland, Army Research Laboratory

Rookie of the Year

Dr. Samuel Bish
National Institutes of Health

Outstanding Technology Transfer Professional Award

Laurie Arrants
National Institutes of Health

Laboratory Director of the Year

Rear Admiral Randolph L. Mahr, USN
Naval Air Warfare Center Aircraft Division

*Also a 2012 National Award Winner

MID-CONTINENT

Outstanding Laboratory

USDA ARS Forest Range Research Laboratory

USDA ARS Poisonous Plant Research Laboratory

Outstanding Regional Partnership

STC.UNM and Sandia National Laboratories

Outstanding STEM Mentorship

Dr. William Crisler
U.S. Air Force Academy

Dr. Prashant Rao and Dr. Subra Sankaran
NASA Johnson Space Center

Excellence in Technology Transfer

USDA ARS Production and Processing Research Unit
"Biodegradable Molded Packaging and Insulation Board Products from Cotton Gin Byproducts"

USDA ARS Roman L. Hruska U.S. Meat Animal Research Center
"iPSNP Consortium Development of the Illumina PorcineSNP60 BeadChip™"

National Renewable Energy Laboratory
Innovalight, Inc.
"Silicon Ink"

National Renewable Energy Laboratory
US e-Chromic Accelerate
"Electrochromic Window Technology"

Los Alamos National Laboratory
L-1 Agrosciences
"The Commercialization of the Transgenic Expression of a Plant Growth Compound"

Sandia National Laboratories
"Solar Glitter"

Notable Technology Development

Sandia National Laboratories
"Gemini-Scout"

USDA Agricultural Research Service
"Range Management Software System"

National Renewable Energy Laboratory
"Black Silicon Etch"

Air Force Research Laboratory, Directed Energy Directorate
"Intelligence Data Analysis System for Spacecraft"
"Counter Electronics High Powered Microwave Advance Missile Project"

NASA Johnson Space Center
"Deployable Fresnel Ring"

Los Alamos National Laboratory
"Movies of eXtreme Imaging Experiments (MOXIE)"

Outstanding Laboratory Representative

Carrieann McDonough
National Renewable Energy Laboratory

MIDWEST

Award for Excellence in Technology Transfer

USDA Agricultural Research Service, Midwest Area
"Commercialization of Estolides as a Biobased Functional Fluid"

NASA Glenn Research Center
*"Stretched Lens Array: Ultra-Light, Affordable Green Energy Technology"**

Partnership Award

Dr. Michael Goldsby

Ball State University Entrepreneurship Center
"Military 2 Market"

Regional Coordinator's Excellence Award

Laurie Stauber
NASA Glenn Research Center

Regional Appreciation Award

Brian Geiselhart
Ball State University Entrepreneurship Center

NORTHEAST

Excellence in Technology Transfer Award

Air Force Research Laboratory, Information Directorate
"The CONDOR Cluster Super Computer"

U.S. Army Benet Laboratories
"Transferring Weapon Modeling Technology from Battlefield to the Medical Field"

John A. Volpe National Transportation Systems Center
"SafeTrip-21"

SOUTHEAST

Project of the Year

USDA ARS, Honey Bee Breeding, Genetics and Physiology Laboratory
*"Honey Bees with Varroa Sensitive Hygiene"**

Excellence in Technology Transfer Award

Centers for Disease Control and Prevention
*"Heat-Inactivated Rotavirus Vaccine"**

DOE Y-12 National Security Complex
"Express Licensing of RonJohn® Solvent to RockinBoat LLC"

USDA Agricultural Research Service, Mid-South Area
"Health Benefits of Pterostilbene"

*Also a 2012 National Award Winner

HONORABLE MENTION

AWARDS FOR EXCELLENCE IN TECHNOLOGY TRANSFER

The FLC recognizes the following nominees for their commitment to technology transfer and support of our mission.

Department of Agriculture

ARS Aquatic Animal Health Research Unit
"Bilingual Reference Manual on the Important Diseases of Farmed Tilapias"

ARS Eastern Regional Research Center, Dairy and Functional Foods Research Unit
"Ready-to-Eat Emergency Air Foods"
"Biocompatible Porous Polymeric Matrix for Human Bone and Tissue Repair"

ARS Midwest Area
"Commercialization of Estolides as a Biobased Functional Fluid"

ARS Natural Products Utilization Research Unit
"Health Benefits of Pterostilbene"

ARS North Atlantic Area, Appalachian Fruit Research Station
"Development, Technology Transfer and Adoption of Innovative Blackberry Trellis System"

ARS North Atlantic Area, Pasture Systems and Watershed Management Research Unit
"Subsurface Application of Manure and Poultry Litter"

ARS South Atlantic Area
"Development of Specialty Wheats and New Markets"

ARS Southern Regional Research Center
"Low Oil Uptake Rice Flour Based Batters"

Carl Hayden Bee Research Center
"Control of Varroa Mites in Honey Bee Colonies"

Cotton Production and Processing Research Unit
"Development of Biomass Materials for Use in Mycellum-Based Biodegradable Packaging"

Invasive Insect Biocontrol and Behavior Laboratory
"Pink Hibiscus Mealy Bug Pheromone"

Roman L. Hruska U.S. Meat Animal Research Center
"iPSNP Consortium Development of the Illumina PorcineSNP60 BeadChip™ "
"SNPs to Differentiate Pathogenic and Nonpathogenic *E. coli* O157:H7 Strains"

Small Grains and Potato Germplasm Research Unit
"Development of Improved Trout and Trout Feed for U.S. Aquaculture"

U.S. Forest Service, Wildland Fire Management Research, Development and Application Program
"Developing the Wildland Fire Decision Support System (WFDSS)"

Department of Defense – Army

U.S. Army Benet Laboratories
"Transferring Weapon Modeling Technology from Battlefield to the Medical Field"

U.S. Army Edgewood Chemical Biological Center
"Agents of Biological Origin Identification (ABOid) System"

U.S. Army Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory
"FMCW Radar Antenna to Detect Oil in Ice"

U.S. Army Engineer Research and Development Center, Environmental Laboratory
"Enhanced Sorption Material (MSorp™) to Remediate Heavy Metal Contaminants"

Department of Defense – Navy

Naval Air Systems Command (NAVAIR) Integrated Diagnostics and Automated Test Systems (IDATS), Lakehurst
" 'Smart Connector' Avionics Diagnostic Testing System"

Naval Facilities Engineering Services Center
"Internal Locking Device for High Security Applications"

Department of Defense – Air Force

Air Force Research Laboratory, Directed Energy Directorate Satellite Assessment Center
"IDASS Space Surveillance System"

Department of Energy

Argonne National Laboratory
"Compact and Lightweight Ceramic Film Capacitors for Power Electronics"
"Autonomie: Innovative Simulation and Modeling Tool for the Automotive Industry"

Lawrence Livermore National Laboratory
"MIR: The Physician's GPS Inside the Human Body"
"Treasures in the Attic: Commercialization of Glycophorin Cell Lines"

Los Alamos National Laboratory
"Muon Tomography Radiation Detector"

National Energy Technology Laboratory
"APECS v2.0 With ANSYS® DesignXplorer™ and ROM Builder"
"Novel Pyrochlore Catalysts for Hydrocarbon Reformulation"
"Electroplated MN-Co Coating for Solid Oxide Fuel Cell Interconnects"

Oak Ridge National Laboratory
"Alumina-Forming Austenitic Alloys"
"Mesoporous Carbon for Capacitive Deionization Electrodes for Destination"
"Superhydrophobic Diatomaceous Earth for Pipes"

Pacific Northwest National Laboratory
"Dynaforge"
"Array Detection Technology for Mass Spectrometry"
"LED Site (Parking Lot) Lighting Technology Specification Project"

Sandia National Laboratories
"Gemini-Scout"

Savannah River National Laboratory
"MicroBlower™ Passive Soil Vapor Extraction System"

Y-12 National Security Complex
"Express Licensing of RonJohn® Solvent to RockinBoat LLC"

Environmental Protection Agency

National Risk Management Research Laboratory
"Developing Media to Remove Mercury and Other Metals from Water"

Department of Health and Human Services – National Institutes of Health

National Institute of Diabetes and Digestive and Kidney Diseases
"A Paradigm-Changing DNA Insulator Element for Efficient Gene Expression"

National Aeronautics and Space Administration

Ames Research Center
"Sample Handling Device for X-ray Diffraction Instruments"

John F. Kennedy Space Center
"Activated Metal Treatment System"

Johnson Space Center
"Solar-Powered Battery-Free Refrigeration System"

Department of Transportation

Volpe National Transportation Systems Center
"Integrated Vehicle Based Safety Systems (IVBSS) Save Lives on Highways"

INTERAGENCY PARTNERSHIP AWARD

The FLC recognizes the following nominees for their joint efforts in technology transfer.

Air Force Research Laboratory Propulsion Directorate, Federal Aviation Administration, Volpe National Transportation Systems Center, and Defense Advanced Research Projects Agency

Volpe National Transportation Systems Center, I-95 Corridor Coalition, and California Department of Transportation

Sandia National Laboratories, Department of Homeland Security, and Federal Emergency Management Agency

U.S. Army Armament Research, Development and Engineering Center, and Department of Homeland Security

USDA APHIS Emerald Ash Borer Biological Control Laboratory, USDA APHIS PPQ Center for Plant Health & Technology, Forest Service, Northern Research Station, ARS North Atlantic Area, and Beneficial Insects Introduction Research Units

STATE AND LOCAL ECONOMIC DEVELOPMENT AWARD

The FLC recognizes the following nominees for their successful partnerships between state and local economic development groups, and federal laboratories for economic benefit.

Air Force Research Laboratory

Air Force Research Laboratory, Information Directorate

National Institutes of Health, National Cancer Institute, National Aeronautics and Space Administration, and National Institute of Standards and Technology

Naval Surface Warfare Center, Carderock Division

Naval Surface Warfare Center, Crane Division

STEM AWARD

The FLC recognizes the following nominees for their outstanding work in support of science, technology, engineering, and mathematics (STEM) education during the past year.

Department of Commerce

National Institute of Standards and Technology

Department of Defense – Army

Tank Automotive Research, Development and Engineering Center

U.S. Army Edgewood Chemical Biological Center

Department of Defense – Navy

Naval Surface Warfare Center, Crane Division

Naval Surface Warfare Center, Dahlgren Division

Naval Surface Warfare Center, Panama City Division

Department of Defense – Air Force

Air Force Research Laboratory, Air Vehicles Directorate

Air Force Research Laboratory, Information Directorate

Air Force Research Laboratory, Space Vehicles Directorate

National Aeronautics and Space Administration

NASA Goddard Space Flight Center

NASA Johnson Space Center

ROOKIE OF THE YEAR AWARD

The FLC recognizes the following nominees for their outstanding efforts in the field of technology transfer in a manner significantly over and above what was called for in the normal course of their work.

Department of Defense – Navy

Emiliano Aragon
SPAWAR Systems Center Pacific

Michael Larkin
Naval Undersea Warfare Center Newport

John Rein
Office of Naval Research

Department of Health and Human Services – National Institutes of Health

Dr. Samuel Bish
National Institutes of Health

OUTSTANDING TECHNOLOGY TRANSFER PROFESSIONAL AWARD

The FLC recognizes the following nominees for their efforts advancing technology transfer at their facilities.

Department of Defense

National Security Agency Technology Transfer Program Team

Department of Defense – Navy

Naval Air Warfare Center Aircraft Division Business and Partnership Office Team
Naval Surface Warfare Center Crane Division Team

Department of Defense – Air Force

Michael Crane
U.S. Air Force Academy

Department of Energy

Catherine Elizondo
Lawrence Livermore National Laboratory

Deborah Payne
Sandia National Laboratories

Department of Health and Human Services – National Institutes of Health

Laurie Arrants
National Institute of Neurological Disorders and Stroke

National Aeronautics and Space Administration

Laurel Stauber
NASA Glenn Research Center

LABORATORY DIRECTOR OF THE YEAR AWARD

The FLC recognizes the following nominees for their efforts in making maximum contributions to the overall enhancement of technology transfer for economic development.

Department of Agriculture

Dr. Sevim Erhan
USDA ARS Eastern Regional Research Center

Department of Defense – Army

Dr. Beth Fleming
U.S. Army Engineer Research and Development Center, Environmental Laboratory

Joseph Wienand
U.S. Army Edgewood Chemical Biological Center

Department of Defense – Navy

Duane Embree
Naval Surface Warfare Center, Crane Division

Donald McCormack
Naval Undersea Warfare Center

Department of Defense – Air Force

Dr. Davy Belk
Air Force Research Laboratory, Information Directorate

Department of Energy

Dr. Adam Cohen
Princeton Plasma Physics Laboratory

Dr. Anthony Cugini
National Energy Technology Laboratory

Dr. Alexander King
The Ames Laboratory

Department of Homeland Security

Dr. Susan Fowler-Hallowell
Transportation Security Laboratory

Department of Transportation

Dr. Wilson Felder
FAA William J. Hughes Technical Center

FLC SERVICE AWARD – REPRESENTATIVE OF THE YEAR

The FLC recognizes the following nominee for his significant contribution to the FLC in the past year.

Department of Defense – Navy

Brian Suh
SPAWAR Systems Center Pacific

AWARDS COMMITTEE

The FLC expresses its gratitude to the members of the Awards Committee for their tireless efforts in making the 2012 awards program a success.

James Poulos, III (Committee Chair)
USDA ARS Beltsville Area

Dr. Mark Allen
Sandia National Laboratories

Tom Anyos
Technology Ventures Corporation

Mojdeh Bahar
National Institutes of Health

Dr. Theresa Baus
Naval Undersea Warfare Center Division Newport

Cheryl Cejka
Pacific Northwest National Laboratory

Dale Clarke
Goddard Space Flight Center

Chris Currens
National Institute of Standards and Technology

Dr. J. Scott Deiter
Naval Surface Warfare Center Indian Head

Joshua Forbes
Air Force Research Laboratory

Cathy Fore
Oak Ridge Associated Universities

Dr. Suzanne Frisbie
National Institute of Allergies and Infectious Diseases

Marcia Graeff
TechLink

Amanda Horansky-McKinney
Naval Research Laboratory

Gary Jones
Federal Laboratory Consortium for Technology Transfer

Ann Kerksieck
FLC Mid-Continent Regional Support

Dr. Robert Lynch, Jr.
Naval Undersea Warfare Center Division Newport

Carrieann McDonough
National Renewable Energy Laboratory

Carolyn McMillan
Marshall Space Flight Center

Steve Neighbors
Strategic & Operational Solutions

Melissa Ortiz
Air Force Research Laboratory Space Vehicles Directorate

Keith Quinn
Air Force Research Laboratory Propulsion Directorate

Linda Schilling
National Cancer Institute

David Sikora
Air Force Research Laboratory

Asuncion Simmonds
Naval Air Warfare Center - Training Systems Division

Susan Sprake
Los Alamos National Laboratory

Dr. Thomas Stackhouse
National Cancer Institute

Kathryn Townsend
Naval Meteorology and Oceanography Command

Dr. Thomas Valco
USDA ARS Mid South Area

Dr. Suzanne Winfield
National Institute of Mental Health

Paul Zielinski
National Institute of Standards and Technology

FLC AWARDS PROGRAM CALENDAR

The calendar year for the FLC awards program runs from June to May. Each year, awards are presented in the following categories:

- Awards for Excellence in Technology Transfer
- Interagency Partnership Award
- State and Local Economic Development Award
- STEM Award
- Rookie of the Year Award
- Outstanding Technology Transfer Professional Award
- Laboratory Director of the Year
- FLC Service Awards
  - Harold Metcalf Award
  - Representative of the Year Award
  - Outstanding Service Award

The following timeline reflects the awards program activity as of press time. Please refer to the FLC website (www.federallabs.org) for updates.

June/July
Criteria for all awards are reviewed and revised.

August/September
Nomination forms for all categories are distributed via e-mail, standard mail, FLC roundtables, and the FLC website.

October
Completed nominations for all categories are submitted to the Management Support Office for processing.

November/December
Judging period for submitted award nominations in all categories.

January
Notification of award winners and non-winners in all categories.

February/March/April
Award winners register for FLC national meeting; non-winners of the Awards for Excellence in Technology Transfer receive written feedback from award evaluators.

May
Awards presented at FLC national meeting.

FLC™

FEDERAL LABORATORY CONSORTIUM
FOR TECHNOLOGY TRANSFER

FLC Washington, DC Office
1001 Connecticut Ave. NW, Suite 735
Washington, DC 20036

FLC Management Support Office
950 North Kings Highway, Suite 208
Cherry Hill, NJ 08034
(856) 667-7727
www.federallabs.org