FEDERAL LABORATORY CONSORTIUM

FLC

FOR TECHNOLOGY TRANSFER

2008 FLC Awards

2008 FLC Awards

May 8, 2008

Portland, Oregon

Adding value to the federal agencies, laboratories, and their partners
to accomplish the rapid integration of research and development
resources into the mainstream of the U.S. economy.

Welcome to the 2008 FLC Awards

Thank you for joining us for an evening of celebrating the success of technology transfer and the people who made that success possible. This year's theme is "On the Innovation Trail," which is the perfect metaphor for the efforts of this year's winners. The process of moving a technology from the laboratory to commercialization is, in many ways, a trail of initiating partnerships, testing prototypes, and marketing, among other things. Our winners have prevailed in navigating that trail and are most deserving of accolades.

Reflecting the diversity of technology transfer efforts within the FLC, we present awards in the following areas:

- Awards for Excellence in Technology Transfer—Presented to FLC member laboratories and their partners for successfully transferring federally developed technologies.

- Laboratory Director of the Year—Recognizes directors of FLC member laboratories for their contributions to the overall enhancement of technology transfer for economic development and their support of the FLC and its activities.

- FLC Service Awards—Presented to individuals, inside or outside the FLC, who have provided significant support to the technology transfer process, furthering the FLC's mission.

- Outstanding Technology Transfer Professional Award—Recognizes the efforts of a technology transfer professional who has demonstrated outstanding work in transferring a technology.

- Interagency Partnership Award—Honors the efforts of agency and/or laboratory employees from at least two different agencies who have collaboratively accomplished outstanding work in the process of transferring a technology.

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 these award winners used to take their technologies from the drawing board to the real world. I am extremely proud and pleased to present the recipients of the 2008 FLC awards.

Lorraine Flanders
Awards Committee Chair

2008 FLC Awards

Awards for Excellence in Technology Transfer

Novel Low-Glycemic Index Sweetener

A team from the Agricultural Research Service's (ARS) Midwest Area developed a technology that converts sugar and corn syrup to value-added carbohydrates. This technology was transferred to Cargill Sweeteners North America, leading to the development of a novel low-glycemic index sweetener, Xtend™ sucromalt. The product is named sucromalt because it is derived from a combination of sucrose (cane or beet sugar) and maltose (corn sugar).

Cargill's sucromalt provides food and beverage customers with a natural and slow release carbohydrate syrup. This fully digestible, low-glycemic syrup provides sweetness and body in one natural ingredient for products such as nutritional beverages and bars, ice cream, jams and jellies, and yogurts. The slow and complete digestibility of sucromalt makes it unique among other sweeteners. In food and beverage applications, sucromalt releases its carbohydrates into the bloodstream slowly, resulting in a muted blood sugar response and a 'sustained energy' release versus the 'fast energy' release and higher glycemic response of sugar. Slowly digestible sweeteners fill a functional gap between full-calorie sweeteners and reduced-calorie sweeteners, such as polyols.

Sucromalt is generally regarded as safe (GRAS), has no daily intake limit, and provides a satisfying sweet taste since it is 70% as sweet as sugar. Sucromalt allows manufacturers to simplify product labeling as it can replace multiple sweeteners and bulking agents. Sucromalt provides body and clean taste, and has physical properties similar to glucose syrups. Cargill anticipates that sucromalt will have broad applications, particularly in health-conscious foods and beverages requiring a low glycemic index.

Left to right: Dr. Greg Cote, Sheila Maroney, Dr. Tim Leathers and Melinda Nunnally

Left to right: Dr. Anton Woo, Dr. Ting Carlson and Dr. Greg Cote

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Development and Implementation of the Sprayed Lethality in Container (SLIC®) Process

Department of Agriculture
Agricultural Research Service-North Atlantic Area

Left to right: Mike Mandel, Rosemary Martinjuk, Neil Goldberg, Dr. John Luchansky, Jeffrey Call, Anna Porto-Fett, and Brad Shoyer

Due to the severity of human listeriosis and the scope, magnitude, and economic burden of costly product recalls, the Department of Agriculture and the Food and Drug Administration have declared a zero-tolerance policy and issued rules to manufacturers to control *Listeria monocytogenes* in ready-to-eat (RTE) meat and poultry products. Current practices, such as post-process thermal treatments and/or application of food-grade chemicals, have met with varying levels of success in reducing the prevalence of this pathogen. Thus, the Sprayed Lethality in Container (SLIC®) method was developed at the Agricultural Research Service's (ARS) Eastern Regional Research Center (ERRC) to deliver antimicrobials to packaged meats to control *L. monocytogenes*. Rather than incorporating an antimicrobial as an ingredient or applying it on or in the packaging material, manufacturers use SLIC® to introduce an antimicrobial solution into the packaging container just prior to when the finished meat or poultry product is placed in the package. They then rely on the vacuum-packaging step to evenly distribute the antimicrobial purge such that total coverage of both product and package is achieved.

The ERRC developed this technology in collaboration with Hatfield Quality Meats. It was transferred to the industry via peer-reviewed scientific publications; presentations at local, national, and international scientific and trade group meetings; and site visits with both regulators and key industry partners.

The laboratory also worked directly with personnel at three different plants to educate them about the theory behind the technology and assist them with reducing it to practice in their facility. In addition, followup collaborative research was conducted with a chemical supplier and an industry partner to expand/refine the technology for their specific needs.

As a result of these collective efforts, at least one small (cook-in-bag beef and poultry), medium (frankfurters), and large (ham) manufacturers are currently using SLIC® to potentially process 55 million pounds of product per year on their existing RTE commercial production lines. The SLIC® technology can eliminate 99.999% of *L. monocytogenes* on product surface and can be implemented and used for far less than any current technology without any deleterious effects on product taste or texture.

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Potato Systems Planner Decision Support CD

Department of Agriculture
Agricultural Research Service-North Atlantic Area
New England Plant, Soil and Water Laboratory

Identifying customers' priority research needs is one of the most critical steps to guiding the development of technology with the highest relevance and adoption potential. The New England Plant, Soil and Water Laboratory (NEPSWL) held a Research Visioning Workshop for the Maine potato industry, where their number one research priority was finding and developing profitable crop rotations for potatoes. In response to this research direction, 14 different cropping systems were evaluated for their impacts on potato yield and quality, nutrient availability, plant diseases, soil microorganisms, potential profitability, economic risk, and other factors.

This information was developed into the "Potato Systems Planner," a decision support tool on compact disc that assists growers with selecting profitable, environmentally sound cropping systems and management practices. For example, the Planner shows that growing sweet corn in rotation with potatoes can increase profitability by $400/acre. It also shows that the probability of an economic loss for the sweet corn-potato system is only 3%, while that for the potato-potato system is 37%. Furthermore, growing canola before potatoes reduces soil-borne diseases by 20-50%, which translates into higher potato yield and quality, along with substantial economic, environmental, and health/safety benefits associated with less pesticide needed to control these diseases. These and many other research findings are presented in the Potato Systems Planner so that growers can make the most informed cropping system selections and employ the most appropriate management practices that are economically and environmentally sustainable.

Left to right: Dr. Robert Larkin, Dr. John Halloran, Dr. Tim Griffin, and Dr. C. Wayne Honeycutt. Not pictured: Dr. Sukla Lakshman.

Since its release in 2005, over 1100 copies of the Potato Systems Planner have been requested by growers, consultants, extension specialists, and scientists who are now using the Planner in 26 states, 8 Canadian provinces, and 28 countries. The Potato Systems Planner was selected as one of only 11 science-track presentations at the World Potato Congress in Idaho and an International Symposium on Farming Systems in Italy. The transfer of this technology to customers, stakeholders, and federal laboratory partners is continuing to this day.

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Color-Infrared Digital Camera for Managing Agriculture and Natural Resources

Department of Agriculture
Agricultural Research Service–Beltsville Agricultural Research Center

Dr. Earle Raymond Hunt, Jr.

Dr. Earle Raymond Hunt, Jr. of the USDA's Beltsville Agricultural Research Center (BARC) modified a commercially available digital camera to make a low-cost color-infrared digital camera for vegetation monitoring. This camera can be used in unmanned airborne vehicles (UAVs) for the agricultural management of fertilizers, pesticides and growth regulators to enhance production and protect environmental quality.

Dr. Hunt conducted preliminary research on the utility of UAVs for agricultural remote sensing because this platform had the potential to overcome the limitations of satellite data for within-season agricultural management. IntelliTech Microsystems, located in Bowie, Maryland, manufactures UAVs for non-military applications and thought that agricultural management would be a potential new market. They sought out Dr. Hunt specifically because of his published research.

A Cooperative Research and Development Agreement (CRADA) was implemented in 2005 with IntelliTech for development of UAV-borne sensors and sensor-dependent algorithms for agricultural management. As the result of the CRADA, a patent application is being submitted for a color-infrared digital camera. IntelliTech has sold more UAVs with the camera included than without, generating $50,000 in extra value.

Furthermore, because of the CRADA, a new UAV is being designed and built for agricultural management. This UAV is easier to fly, can take off and land anywhere, and will cost customers less. Because most customers want to purchase data without buying the entire UAV system, IntelliTech formed a subsidiary, AeroView International LLC, to provide UAV services. With the extra capabilities provided by the transferred technology, IntelliTech Microsystems is actively pursuing new markets in natural resource management.

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Commercializing Optical Trap Detectors for Calibration of Laser Power

Department of Commerce
National Institute of Standards and Technology

A team at the National Institute of Standards and Technology (NIST) transferred the design, assembly, test and operational knowledge of a highly accurate optical power detector to Spectrum Detector, Inc., which has successfully commercialized six products based on this knowledge. The commercial availability of a metrology-grade trap detector is allowing companies that manufacture and use laser power and energy meters to obtain stable, high-accuracy transfer standards at a reasonable price. As a result of this technology transfer, Spectrum Detector is enabling innovation in such diverse areas as optical communications, laser machining, and medicine.

As the United States' National Metrology Institute, NIST is responsible for disseminating basic and derived units of measurement (such as laser power). A critical part of obtaining measurement traceability through a NIST calibration is the use of transfer standards. Ideally, these standards must be stable, exhibit low uncertainty, and be tolerant of variations in measurement procedure. NIST developed transfer-standard detectors based on an optical trap design that improved the dissemination of optical power internal to NIST and among metrology institutes in other countries. These optical trap detectors represent the state-of-the-art in calibration transfer standards for laser power measurements and form the basis of this technology transfer.

The novel trap design allows the measurement of a variety of optical beam geometries, thus supporting diverse optical sources such as laser beams, optical fibers, light emitting diodes (LEDs), and lamps, and provides improved accuracy while increasing the tolerance to optical beam variations. This invention has successfully decreased metrological uncertainty for commercial manufacturers and users of energy meters and National Metrology Institutes worldwide, and through this technology transfer is improving manufacturing operations and product quality across multiple industries.

Left to right: Don Dooley, Dr. John Lehman, Xiaoyu Li, Dr. Chris Cromer.

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ProjNet[SM]

Jeffrey Kirby

Dr. E. William East

Engineers at the U.S. Army's Engineer Research and Development Center, Construction Engineering Research Laboratory (ERDC-CERL) have developed and transferred a suite of innovative web-based software that significantly improves the design, bid, and build phases of facility construction.

The ProjNet[SM] modules were created to help project participants collate and review the voluminous data involved in the vast array of facilities constructed by government and commercial groups.

The software package addresses specific stages of building design, allowing preapproved team members to post documents, exchange comments, and make real-time decisions online.

The CERL team initially developed the software to aid federal agencies in their building programs, resulting in considerable cost savings through expedited review processes. Aware of similar data-overload issues in private industry, the nominees initiated transfer of their software to the nonprofit trade association, the National Institute of Building Sciences (NIBS), which will market ProjNet[SM] to both government and commercial subscribers. In 2006, CERL and NIBS simultaneously signed a patent license agreement and a renewable five-year Cooperative Research and Development Agreement (CRADA), creating a two-way partnership wherein CERL engineers continue their development of new or enhanced modules in response to needs identified by NIBS.

ProjNet[SM] offers important cost-saving benefits to the building industry through reduced meeting and review times, convenient collation of data and comments, updated standards and specifications during design phases, greater participation by all relevant team members, rapid communications across time zones, complete records of each interaction, online real-time sharing of documents and review comments, and more. Stringent security measures ensure that only preapproved individuals participate in each phase of a project.

The success of ProjNet[SM] suggests similar approaches to other project-oriented efforts weighed down by too much information and widely diverse team profiles, such as personnel management or accounting departments in multinational companies.

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Managing Aquatic Weeds in Our Nation's Waterways

Department of Defense – U.S. Army
U.S. Army Engineer Research and Development Center
Environmental Laboratory

Front row, from left: Angela Poovey and Dr. Linda Nelson
Back row, from left: John Skogerboe, Dr. Kurt Getsinger, and Dr. Michael Netherland.

The U.S. Army Engineer Research and Development Center, Environmental Laboratory (ERDC-EL) in Vicksburg, Mississippi, has been the primary research entity evaluating new chemical control techniques and transferring those technologies to other agencies, the private sector, and the general public. To ensure that technical expertise and capabilities for managing vegetation in and around water bodies were not lost, the Aquatic Ecosystem Restoration Foundation (AERF), a nonprofit organization, was formed by concerned private and public groups to support applied research and development. Cooperative Research and Development Agreements (CRADAs) were established between AERF and ERDC-EL to provide a mechanism for transferring chemical control technology from ERDC-EL to academia, industry, and government. Maintaining weed management options with both newer and older herbicides is a significant accomplishment of the ERDC-EL team. To date, AERF has sponsored over $2 million via the CRADA for use in aquatic herbicide research and technology transfer.

Maintaining an adequate and high-quality water supply is a high priority among research scientists, natural resource agencies, and those responsible for the management of water resources. Non-native plants can destroy aquatic ecosystems as they out-compete and replace native plant communities that are critical for fish and wildlife habitat.

Because natural water bodies are sensitive ecological systems, any management techniques used to reduce nuisance vegetation must focus on species-selective control, while minimizing the adverse impact to the aquatic environment and to those using the resources. The development of such management tools requires sustained, adequately funded, high quality, applied research programs. Through the encouragement and leadership of the R&D team at ERDC-EL and the availability of resources via AERF, a number of researchers in government and academic facilities have become involved with supporting the testing and development of new and older chemicals for use in aquatic systems. Sharing the results through AERF from university researchers and ERDC-EL and private laboratories allowed the registrants to have a large database from which to develop their registration submissions.

AERF essentially has become a clearinghouse for water resource management information among government, academic, and private sector researchers and a way for new products to be evaluated. By partnering with industry and academia, ERDC-EL through AERF is positively affecting the national research focus, while being able to have a greater impact on the direction of aquatic herbicide research and providing new chemical control products and techniques that are transferred to industry and the public.

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Composite Acoustic Attenuation and Vibration Damping Materials

Department of Defense – U.S. Navy
Naval Aerospace Medical Research Laboratory

The Naval Aerospace Medical Research Laboratory (NAMRL) partnered with ElastoCall Services to develop and patent a new composite technology that provides a lightweight, inexpensive means of stopping low-frequency (below 125 Hz) noise such as that from roads, motors and generators, stereo bass, and aircraft. The technology works by improving the low-frequency sound-blocking characteristics of a variety of materials such as epoxies, resins, silicon gels, polyurethane foams, plastics, and silicon- and carbon-based rubbers with which it is combined. Applications of this technology are particularly important in reducing noise in marine vessels, homes that may be located near an airport or industrial plant, aircraft cockpits, and aircraft carrier flight decks. The technology has equally important application for the Joint Strike Fighter (JSF) rotary wing environment, where low-frequency, high-energy noise is a significant problem.

Existing sound-absorptive materials are generally good barriers for acoustical noise above 500 Hz, but poor at lower frequencies. The new technology takes advantage of the fact that acoustical energy (noise) is inefficiently transferred between media differing in characteristic acoustical impedances, thus significantly increasing their sound-damping capability. The sound-absorptive materials dampen low-frequency sound while adding only marginally to the weight characteristics of the base material. Unlike the vast majority of sound-attenuating materials, doubling the thickness or weight of the product doubles its sound-attenuating properties. Another advantage is that components can be manufactured in a variety of ways, including casting, spraying, extrusion, and molding processes.

In 1995, the original patented technology was transferred via a Cooperative Research and Development Agreement (CRADA) from NAMRL to Moldex Rubber Company, which subsequently applied for a nonexclusive license and developed the technology for the automotive industry. In 2000, ElastoCall Services, Inc. was also granted a nonexclusive license to the original patent and entered into a CRADA with NAMRL. It was under this CRADA that the matrix material was combined with a second layer of a decoupling material that serves to effectively isolate the matrix material and reduce its tendency to vibrate. For this invention, a second patent was issued and an exclusive license to ElastoCall resulted in 2007. ElastoCall incorporated the composite technology into its marine product line and, with NAMRL, has made large surface area sheets of the material, which has a well-defined potential in the marketplace for use under carpet mats, in headliners for cars, and for sound barriers for highways. Structural materials that dampen sound and vibration have an enormous application in the manufacturing of anything using an advanced composite. Products being sold using this technology will broadly benefit military and civilian areas, including automotive, marine, industrial, and aircraft markets.

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Transparent Spinel Ceramic

Material scientists at the Naval Research Laboratory (NRL) have developed and commercialized a novel process to produce transparent spinel ceramic with qualities superior to traditional materials used for windows, protective armor, and numerous other government and private sector applications. The NRL team overcame failures in existing processing techniques to produce, for the first time, a cost-effective, high-optical-quality spinel ceramic that was more rugged than glass, transparent to more light wavelengths than sapphire, and otherwise superior to the standard commercially available materials.

Within six months, the NRL team successfully transferred its spinel ceramic technology to MER Corporation of Tucson, Arizona, by providing research-based guidance and regular technical support to company personnel during initial stages of commercial production. Concurrent patent licensing and Cooperative Research and Development Agreements (CRADAs) between NRL and MER expedited the transition of this new processing technique to the private company, now the first U.S. supplier of the breakthrough material.

The NRL-patented processing method and its spinel ceramic product together represent notable advances over traditional processing methods and transparent materials in terms of scalability, production rates, performance, durability, cost-effectiveness, and range of potential applications. The transferred technology yields material of superior strength and clarity, with marked advantages. Anticipated military applications range across the spectrum, from personnel protective items like face shields to explosive-resistant windows in aircraft, ground vehicles, and submarines, to high-energy laser systems. Commercial uses appear nearly limitless, given the ubiquity of consumer electronics using rugged transparent materials, e.g., display windows. Reduced manufacturing costs and improved performance assure that the NRL-patented spinel ceramic processes could reshape industry technologies and product standards, with the potential to capture a multi-billion dollar share of the global market.

Left to right: Dr. Ish Aggarwal, Dr. Shyam Bayya, Dr. Rita Manak, Dr. Guillermo Villalobos, Amanda Horansky-McKinney, Dr. Jas Sanghera.

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QwikLite 200™

Department of Defense – U.S. Navy
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The Assure Controls Team

Just as canaries were used underground to warn miners of harmful gases in the air, certain species of plankton are now being used as bio-indicators of toxicity in water or soil samples. Under normal conditions, these plankton produce a visible blue-green light when agitated. In researching the predictability of this bioluminescence, Dr. David Lapota, a senior scientist with the Environmental Sciences and Applied Systems Branch of the Space and Naval Warfare Systems Center, found that the bioluminescence was measurably affected by exposure to toxins.

Realizing that plankton were much more sensitive than the shrimp and juvenile minnows used in traditional bioassays, Dr. Lapota invented the field-deployable bioluminescent bioassay system called QwikLite. The Navy licensed this technology to Assure Controls, Inc. of Carlsbad, California, in April 2005; and, with commercialization support from the Center for Commercialization of Advanced Technology, two Cooperative Research and Development Agreements and four more patents, it is now on the market as the QwikLite 200 ™.

About the size of a briefcase, the unit includes a battery-operated instrument that interfaces with a handheld PDA, laptop or personal computer, and disposable test kits of packaged dinoflagellate plankton, which require no food or water changes and have a shelf life of several months.

In addition to providing a more accurate measurement of toxicity, QwikLite is much less costly than traditional bioassays because it can be done in the field. It also produces results in as little as 24 hours, while traditional assays take days. With the QwikLite 200™ instrument, the test can be done onsite, the data collected automatically, and toxicity can be determined in as little as 24 hours for a fraction of the cost.

Water is often said to be our most precious commodity. This technology offers the hope of saving billions of gallons of water in every part of the world through simple, affordable regular testing, ensuring that toxin levels are monitored, known and addressed through both cleanup and preventative measures. Internationally, the technology can be used to protect the military in the field, as well as help deliver clean water to citizens in areas such as Iraq.

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The Civilian American and European Surface Anthropometry Resource (CAESAR™) Project

Department of Defense – U.S. Air Force
Air Force Research Laboratory, Human Effectiveness Directorate

Anthropometry research—the study of human body measurements—at the Air Force Research Laboratory's Human Effectiveness Directorate (AFRL/RH) has dramatically transformed the engineering of virtually all products people wear or use by providing fit visualization and analysis capabilities never before possible.

This technology transfer enables the international interoperability of equipment and apparel, ensures that products made anywhere in the world will accommodate their target populations, and is important to the development of biometric identification systems.

A Cooperative Research and Development Agreement (CRADA) was established between AFRL/RH and the Society of Automotive Engineers International. The CRADA brought 35 companies into partnership with the government, including apparel makers, defense contractors, tractor manufacturers, automakers, and general merchandise retailers. Recognizing the potential of the technological challenge they had accepted, the diverse group embarked on the creation of the Civilian American and European Surface Anthropometry Resource, or CAESAR™, the world's first body-measurement survey to deliver raw three dimensional (3-D) scans of every subject.

Using a 3-D scanner, researchers can capture hundreds of thousands of data points of the human body in just a few seconds. Through a second CRADA, General Dynamics Advanced Information Systems operates the AFRL/RH's Computerized Anthropometric Research and Design (CARD) Laboratory and coordinates CAESAR data dissemination. The development of the first laser-based system of measuring humans in 3-D and obtaining a comprehensive database of body measurements has resulted in a worldwide organization known as WEAR (World Engineering Anthropometry Resource) that unites scientists in ten countries on six continents in a quest to better fit the human body to its clothing, technology, and environment.

CAESAR's complete 3-D data help manufacturers revamp antiquated sizing methods, especially for women's wear. Designers can extract an almost infinite number and variety of measurements from the database. Whole body scans reduce the guesswork about the measurements of the body surface and provide more accurate measurements. Thanks to CAESAR, daily life is easier, safer, more comfortable, and more productive for civilians and military personnel.

Front row, from left: Cecelia Mitchell, Dr. Kathleen Robinette, Teresa Crase
Back row, from left: Scott Fleming, Dr. Gregory Zehner, Dr. Jeffrey Hudson
Not pictured: Sherri Blackwell, Mark Boehmer, and Dennis Burnsides.

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Helical Fiber Amplifier

Department of Defense – U.S. Navy
Naval Research Laboratory

Department of Energy
Sandia National Laboratories

Dr. Jeffrey Koplow (left) and Dr. Dahv Kliner. Not pictured: Dr. Lew Goldberg

Physicists affiliated with the Naval Research Laboratory (NRL) and Sandia National Laboratories (Sandia) have developed and commercialized a patented laser component that revolutionizes the potential applications of fiber lasers. The NRL/Sandia team discovered that coiling laser fibers in precise dimensions will filter out undesirable light modes, thereby making high-power fiber lasers possible. Their inventive solution resolved the power limitations of fiber lasers that had stymied the industry since these lasers were first developed in 1963, while preserving high beam-quality output. The groundbreaking discovery now allows production of high-power fiber lasers that are more cost-effective, rugged, and compact than other types of lasers.

Following patent approval in 2002, the team initiated transfer of its helical fiber amplifier (also called a mode-filtering fiber amplifier) to several commercial laser manufacturers: Nufern of East Granby, Connecticut; LIEKKI Corporation of Lohja, Finland; and IMRA America, Inc., of Ann Arbor, Michigan. By 2006, all three companies had received patent licenses allowing use of the innovative technology in their laser-based product lines. Over time, the technology transfer involved a changing list of collaborative partners and agreements as the inventors moved on to other research institutions. Despite the complexities involved, the outcome has been impressive, with new products already on the market and vast potential markets awaiting the new award-winning technology.

The collaboration between Department of Defense and Department of Energy researchers to develop the NRL and Sandia-patented technology will significantly affect industries like telecommunications, materials processing, and remote sensing by enabling lasers with higher power capability, superior performance features, lower maintenance costs, and smaller size. Applications range across the private and public sectors from real-time contaminant sensing and precision circuitry manufacture to secure high-bandwidth communications. Helical fiber amplifiers are already changing the worldwide fiber laser industry, shaping multibillion dollar market shares and creating new-product possibilities.

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Antibody Profiling Identification

Left to right: Debby Bruhn, Gregory Lancaster, Elizabeth Taylor, Dr. William Apel, Gordon Lassahn, Lawrence Cook, Dr. Vicki Thompson, Heather Silverman, Karen Delezene-Briggs, Joni Barnes. Not pictured: Dr. John Snyder.

In the popular TV series CSI: Crime Scene Investigation, the investigators receive DNA test results in minutes and by the end of a one-hour show, arrest their suspect. Real-life forensics testing takes longer—sometimes months longer. If the crime being investigated is perpetrated by a serial criminal, this means not only wasted time, but additional victims. Today, a new technology can quickly screen forensic samples and reduce the number of samples requiring more extensive DNA testing—Antibody Profiling Identification (AbP ID™).

First identified in 1988, these particular antibodies are called Individual Specific Autoantibodies (ISAs), and they perform a "housekeeping" role in the body by removing dead and diseased cells. Because they are directed against an individual's own tissues, ISAs are unique to each person—and are as individual as a fingerprint. These individual-specific autoantibodies are present throughout life, and their production isn't changed by illness, medication, or food or drug intake. Humans are born with a full complement of ISAs; however, newborns have the same ISA pattern as their mothers. Humans develop their own unique ISA pattern by the age of two, and after this age, even though body chemistry changes, the ISA profile does not.

Developed by researchers at Idaho National Laboratory (INL), AbP ID™ is a powerful new forensic tool that uses a special class of antibodies found in all body fluids, including blood, saliva, urine, perspiration, tears and semen. Coupled with Image ID™, INL's proprietary digital imaging software, this technology provides a low-cost, easy-to-use, accurate, and fast method to identify suspects through forensic evidence and build a searchable database. Although the chemistry behind AbP ID™ is complicated, the test procedure itself is not. At a fraction of the cost of a DNA test, an assay can be prepared in about two hours by someone with a high school education and the most basic lab equipment. This makes AbP ID™ perfect for preliminary screening of forensic samples, ensuring that only the most likely candidates undergo more expensive, time-consuming DNA testing.

DNA testing costs from $200 to $1,200 or more per assay and, because it requires specialized equipment and highly trained personnel, is only performed at large forensic labs or private DNA testing labs. DNA testing also takes a minimum of 48 hours to complete, but can take weeks, depending on the type of test, and sometimes months, depending on the backlog of cases at the lab. At a projected price that is much lower than the least expensive DNA test, AbP ID™ brings high-level forensic screening capability to law enforcement agencies of all sizes, regardless of geographic location or financial limitations.

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Dielectric Wall Accelerator for Proton Therapy

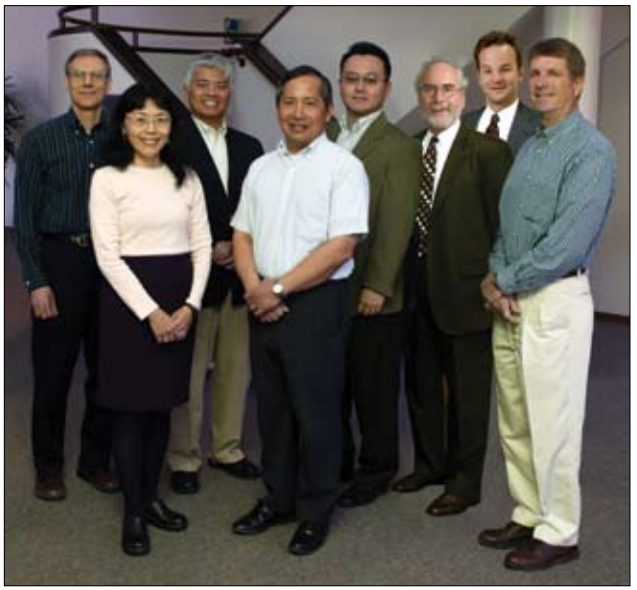
Department of Energy
Lawrence Livermore National Laboratory

More than half of the roughly one million people diagnosed with cancer each year will be treated using radiotherapy. Conventional radiotherapy kills cancer cells using X-rays that deliver high energies to the tissues they travel through, from the point they enter the body until they leave it. A more advanced form of radiation therapy uses proton beams that deposit almost all of their energy on the target, enabling doctors to hit tumors with more effective radiation doses than is possible with conventional radiation.

Despite its usefulness, proton therapy remains available at only 25 cancer centers worldwide due to the substantial size and cost of implementing the technology. The Dielectric Wall Accelerator (DWA)—the technology behind a proton therapy system that is expected to fit in standard radiation oncology clinics and cost significantly less than conventional proton therapy systems—intends to overcome these hurdles and make proton therapy more widely available. An offshoot of defense-related research at Lawrence Livermore National Laboratory (LLNL), the DWA accelerates protons to the required energies for cancer treatment without using bending magnets or other techniques that take up space and generate unwanted radiation.

In 2005, the DWA research team, jointly funded by LLNL and the University of California (UC) Davis Health System, achieved component feasibility for a compact proton accelerator that uses the DWA. Efforts to commercialize the technology failed, however, because the project lacked a working prototype. In early 2006, both parties took the unusual step of investing $1.5 million each toward development of a prototype. Because of the DWA, LLNL created a strategic technology maturation fund for technologies that provide a demonstrable spin back to a LLNL program or that can make significant contributions to an important national problem—in this case, cancer therapy.

The team then looked for a commercial partner that could integrate the DWA into a proton therapy system. TomoTherapy, Inc. was one of the companies that expressed interest. It officially submitted a commercialization plan in June 2006, and by February 2007 a license and a Cooperative Research and Development Agreement were executed. The successful transfer of the DWA technology is serving as a model for future endeavors. LLNL and UC Davis are now collaborating on more than a dozen projects that promise breakthroughs in the detection, treatment, and prevention of cancer.



Left to right: Dr. George Caporaso, Dr. Yu-Jiuan Chen, Genaro Mempin, Dr. Steve Sampayan, James Tak, Dr. Dennis Matthews, Tod Stoltz and Dr. Roger Werne

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Fission Meter™

Front row, from left: Dr. Daniel Dietrich, Catherine Elizondo, Dr. Manoj Prasad, Dr. Tim Twomey and Dr. Daniel Upp
Back row, from left: Dr. Mark Rowland, Ray Pierce, Dr. Neal Snyderman, Pedro Castro
Not pictured: Dr. Ray Alvarez, Doug Howard, Dr. Phillip Kerr

International terrorist activity during the last several years has created a worldwide demand for detectors that can identify fission material—an essential ingredient in nuclear explosives. To meet this demand, Lawrence Livermore National Laboratory (LLNL) developed an advanced neutron source identification system for the interdiction of fissionable material.

The ORTEC Fission Meter™ is the first portable neutron detector that can distinguish between a fissile and a non-fissile neutron source in real time. This detector provides "proof positive" identification of fissile neutron sources such as uranium-233, uranium-235, and plutonium-239, and is a valuable companion to the ORTEC Detective family of portable radiation identifiers.

The advanced technology consists of a low-cost digital data acquisition unit that collects data at a high rate and in real time processes large volumes of data directly into information that a first responder can use to differentiate fissile from non-fissile materials.

Entering into a partnership to transfer this technology was AMETEK, a leading global manufacturer of electronic instruments and electromechanical devices. AMETEK's Advanced Measurement Technology ORTEC Division was granted nonexclusive rights to commercialize the Fission Meter™ technology in August 2005. The nonexclusive license grants the use of three patents (pending) and a copyright. The Fission Meter's™ field-of-use limitation requires that the technology be developed specifically for handheld portable background radiation and neutron source characterization for first-responder search applications.

The Fission Meter™ is being marketed commercially for the federal government, first responders, state and local entities, and foreign governments. As one of the world's leaders in manufacturing radiation detectors and portal monitors, ORTEC has worked with U.S. government agencies, national laboratories, foreign government entities, and private industries, and is a current LLNL licensee for other homeland security technologies.

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Greg Failla, Chief Executive Officer of Transpire, Inc., has plenty of reasons to be proud of what the company has accomplished in the past six years. In 2002, Radion Technologies (later reincorporated as Transpire, Inc.) was founded by Failla and two former Los Alamos National Laboratory (LANL) scientists, Drs. John McGhee and Todd Wareing. Drs. McGhee and Wareing launched the startup company while on an entrepreneurial leave of absence from LANL, where they worked as scientists. They were joined soon after by Dr. Allen Barnett, who previously worked as a shielding engineer in the U.S. Navy's Naval Nuclear Propulsion Program.

Through a licensing agreement with LANL, the company built on core technology that originated at the laboratory to develop a complete radiation transport software product, Attila, that can predict how radiation behaves in a broad range of applications faster and more accurately than just about anything else.

Since the first official release of Attila in January 2004, interest has grown rapidly. Attila is now being used in over seven countries for applications as diverse as radiation shielding, radiotherapy, medical imaging, fusion research, homeland security, spacecraft design and reactor analysis. In addition, the company has received numerous Small Business Innovation Research grants, including two from the National Cancer Institute for medical imaging and radiotherapy, which total almost $2 million.

Left to right: Gregory Failla, Dr. Allen Barnett, John Davies, Dr. John McGhee, Dr. Todd Wareing

In 2007, Transpire generated close to $1 million in revenue from software and training alone, and anticipates exceeding this in 2008. Because of these revenues and the large number of grants, Transpire will be able to broaden the software for additional markets. The software has recently been added to the short list of validated codes for International Thermonuclear Experimental Reactor (ITER) neutronics analyses. ITER is a joint international research and development project that aims to demonstrate the scientific and technical feasibility of fusion power and involves partners from all over the world. The company also has a multi-year project with Pacific Northwest National Laboratory to develop a scenario analysis tool to detect radiological threats at U.S. ports of entry. The software has been licensed by leading healthcare companies involved in both radiotherapy and medical imaging. Additionally, Transpire has active collaborations with the University of Texas M.D. Anderson Cancer Center for radiotherapy and Baylor College of Medicine for medical imaging.

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High-Definition Laser Scanners for Surveying

Department of Energy
Los Alamos National Laboratory

LANL Hi-Def Laser Scanner Team

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When Los Alamos National Laboratory (LANL) scientist Dr. James Lunsford received a patent for his Offset Stabilizer for Comparator Output, he never imagined it would become a crucial component in a line of high-definition surveying (HDS) laser scanners produced by Leica Geosystems, a world-class manufacturer of precision measuring instrumentation.

Dr. Lunsford developed his technology to satisfy the need for more precise time-interval measurement increases "as we probe ultrafast processes in the physical and biological worlds." It contributes the ability to maintain the high accuracy of 6 millimeters at a distance of 50 meters (1.5 mm for extracted targets) during a survey, reducing or eliminating the need for costly return visits to a site. It also contributes to more accurate, complete as-builts for retrofit design projects, which translates into better, more cost-effective retrofit designs. This sub-microsecond interval timing ensures that each interval is absolutely equal to other intervals. Such accurate measurements from period to period are required in instrumentation used in the national security programs at LANL.

In 1997, Cyra Technology licensed Dr. Lunsford's technology for integration with its Cyrax 3-D imaging system to produce more accurate as-built drawings of existing structures (plants, buildings, etc.). Acquired by Leica Geosystems in 2001, Cyra was renamed Leica Geosystems HDS in 2004.

In 2003, Leica introduced the HDS3000 laser scanner, an improved version of the Cyrax 3-D system, with increased speed and accuracy, to the market. In 2006 and 2007, Leica introduced ScanStation and ScanStation 2. ScanStation 2 is on the order of 1000 percent faster in many situations. While the laser in the HDS3000 and ScanStation was limited to 4000 points per second at peak, ScanStation 2 runs at 50,000 points per second at peak, with its speed and accuracy directly attributable to the LANL patented technology.

Second-Generation High Temperature Superconducting Wire

Department of Energy
Los Alamos National Laboratory

Second-generation (2G) high temperature superconducting (HTS) wire is a revolution in the electric power industry. Using a patented deposition method developed at Los Alamos National Laboratory (LANL) in collaboration with industry partner SuperPower Inc., the 2G HTS wire can carry 200 times more current than traditional copper wires. Compared to other HTS wire, the LANL 2G HTS wire is faster to produce, inexpensive, and can be manufactured in kilometer lengths.

SuperPower Inc., a wholly owned subsidiary of Intermagnetics General Corporation, develops state-of-the-art 2G HTS wire and electric power components such as underground transmission and distribution cables, transformers and fault current limiters, all used to transmit electricity. LANL and SuperPower began collaborating in 2000 when the first Cooperative Research and Development Agreement (CRADA), originally with Intermagnetics, was executed for the development of an earlier version of the coated conductor technology. With the formation of SuperPower, Intermagnetics made a commitment to invest significant resources in the scale-up of 2G conductors. That CRADA remains an ongoing collaboration, which has had multiple modifications, and is now focused on lowering the cost of 2G HTS wire and simplifying the wire architecture.

As one of only a handful of companies working on 2G HTS wire development, SuperPower, based in Schenectady, New York, is targeting the $18-billion electric power industry. The company began manufacturing the wire in 2006. Using first-generation HTS wire, SuperPower has already implemented its first commercial in-grid demonstration of the technology in Albany County, New York, connecting two power substations by running a 350-meter superconducting wire. Additionally, SuperPower has manufactured enough 2G HTS wire to replace a 30-meter section of the 350 meters in Albany County that was slated to be energized by the end of 2007. Through the CRADA and new license agreements, the LANL continues to work with SuperPower on improvements to transfer the latest research that will enable the broader commercial viability of the material.

Left to right: Dr. Quanxi Jia, Dr. Paul Arendt, and Dr. Steve Foltyn
Not pictured: Dr. Venkat Selvamanickam, Dr. Xuming Xiong, Dr. Yimin Chen

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Coal Chemistry Module

Dr. Chris Guenther and Dr. Madhava Syamlal

Researchers at the National Energy Technology Laboratory (NETL) developed the Coal Chemistry Module (CCM) software as a means to incorporate coal chemical reactions into physics-based models of multiphase reactors to solve scale-up problems for advanced power plants using coal gasification, such as integrated gasification combined cycle (IGCC) plants. Advanced power plant technologies combine the technology of multiphase reactors with high-temperature chemical reactions for processing fossil fuels.

With industry partners, NETL is leading the way to a new generation of simulation software capable of integrated solutions to this technology challenge. The effort has resulted in the development of CCM, which has been incorporated in the NETL open-source multiphase flow code MFIX (Multiphase Flow with Interphase eXchanges). Code MFIX was the winner of a 2007 R&D 100 Award and has been used in collaborative projects with end users. Technology transfer of CCM is being done under a Cooperative Research and Development Agreement (CRADA) with FLUENT, a well-known fluid dynamics code. These developments have had a positive impact on not only the primary target, the fossil fuel industry, but also coal conversion R&D at universities and national labs.

Researchers at NETL and design engineers at Southern Company and Kellogg Brown & Root (KBR) are using the CCM as part of an overall MFIX simulation of the transport gasifier at the Power Systems Development Facility in Wilsonville, Alabama. The transport gasifier is a promising process for use in high-efficiency, low-emission IGCC systems. The simulations convincingly showed gasifier developers that the model does not merely reproduce what is already known, but provides insight into unobserved phenomena, which they could later verify experimentally. Also, CCM was used with MFIX to predict the expected gasifier behavior almost a year before certain design modifications were completed. KBR design engineers are using similar simulations to help with the design of a commercial-scale Clean Coal Power Initiative (CCPI) transport gasifier at Orlando, Florida.

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High-Temperature Sorbent to Control Mercury in Gasification Processes

Department of Energy
National Energy Technology Laboratory

In this project, researchers at the National Energy Technology Laboratory (NETL) developed a novel technology to remove mercury in gasification-based electric power generation systems, and transferred the technology to Johnson Matthey Corporation (JM) for commercialization. The technology was developed by in-house research at NETL. The technology transfer activities included licensing a patent on a technique to remove the pollutant mercury in gasification-based power generators and a Cooperative Research and Development Agreement (CRADA) between NETL and JM. JM not only wished to pursue this mercury removal technology, but also realized the future importance of coal gasification as a means to produce power, hydrogen, and chemicals. NETL's idea for mercury removal was licensed to JM under the CRADA. The potential market for the technology is significant. Additionally, when the technology is implemented, the American public will benefit because low-cost electric rates would continue and ambient air would be free of mercury.

Over 50% of U.S. electric power comes from coal. A major concern for power generation systems that use coal as an energy source is air emissions from the plant. Although certain gaseous emissions are currently regulated, the emergence of new regulations governing mercury by the Environmental Protection Agency (EPA) will have a direct impact on coal-using facilities, both conventional steam generating systems as well as advanced power systems such as integrated gasification combined cycle (IGCC) systems.

Gasification is an important strategy for increasing the utilization of abundant domestic coal reserves and is a key to the improved power generation thermal efficiency of IGCC. The Department of Energy envisions increased use of gasification in the U.S. during the next several decades, particularly for its adaptability to remove carbon dioxide, a greenhouse gas. As such, the gasification-based technology strives to approach a near-zero emissions goal with respect to pollutants. Mercury is a pollutant that must be addressed by gas cleaning and conditioning. With the EPA's March 2005 Clean Air mercury rule and many states promulgating their own regulations, the need exists for a low-cost mercury removal technique that can be applied to gasification-based processes (e.g., IGCC) and conventional coal-burning plants. Thermal efficiency considerations and completeness of removal are two concerns that are alleviated when elevated temperature removals of mercury are conducted in a gasification system.

Henry Pennline and Dr. Evan Granite

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High-Performance Lanthanum Manganese Oxide-Enabled, High-Temperature Superconducting Tape

Department of Energy
Oak Ridge National Laboratory

Dr. Venkat Selvamanickam, Dr. Amit Goyal, Dr. M. Parans Paranthaman, Dr. Xuming Xiong, and Dr. Tolga Aytug

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The SuperPower/ORNL High-Performance Lanthanum Manganese Oxide-Enabled, High-Temperature Superconducting Tape (LMOe-HTS) is a robust, high-current second-generation superconducting wire. The technology was developed by means of a Cooperative Research and Development Agreement between Oak Ridge National Laboratory (ORNL) and SuperPower, Inc., of Schenectady, New York.

The Department of Energy (DOE) has funded three different Superconductivity Partnerships for Industry (SPI) projects to demonstrate the use of HTS power cables for electric transmission and distribution.

The LMOe-HTS has the unique combination of strength, flexibility, throughput, and low cost needed for power-grid applications, including coils and motors. It can be fabricated at high throughput rates using reel-to-reel processes. The key to its success, as well as the key improvement from previous technology, is the development and use of an epitaxial $LaMnO_3$ (LMO) buffer layer, which can be deposited at high rates homogenously in long lengths. The use of this buffer enables fabrication of the complete substrate for growth of superconductors at very high throughput rates. The buffer layer also enables formation of very high performance superconducting films.

SuperPower licensed this technology from ORNL (via UT-Battelle, LLC, the management and operations contractor for ORNL, under contract to DOE) under an exclusive, field-of-use license agreement, for the purpose of incorporating LMO into its superconducting wires, tapes, and cables to improve performance. Sumitomo Electric Industries of Osaka, Japan, in partnership with SuperPower, has used LMOe-HTS wire to construct a 30-meter cable that was slated to be installed in the national grid in Albany, New York, in 2007. It is the world's first second-generation HTS device. Two other demonstration projects are planned in Long Island, New York, and Columbus, Ohio. The LMOe-HTS won an R&D 100 Award in 2007.

Energy Expert

From left: Robert Pratt, Bob Silva, Michael Brambley, Patrick O.Neill, David Chassin, Paul Bursch, Teresa Carlon, Sarah Benjamin, David Hunt, Srinivas Katipamula, Shirley Schultz, Krishnan Gowri

Energy Expert is the commercial name given to the newly adapted version of Pacific Northwest National Laboratory's (PNNL) Whole Building Energy Diagnostician (WBE). The technology was originally designed as a stand-alone software tool for monitoring a building's energy use. More specifically, the WBE is a software tool that monitors energy use in whole or major building systems.

The technology uses trend data to automatically detect and provide alerts for anomalies in energy consumption, as well as supporting information on causes. The technology automatically creates a model of energy use as data are accumulated. The model is then used to predict future energy use and alerts building operations staff to variances between actual measured consumption and the expected measurements.

NorthWrite, Inc. realized the commercial potential of the software, but needed it reconfigured to operate as a Web-based technology. NorthWrite approached PNNL to help them make the adjustments. Using funds from the Federal Energy Management Program, a team from PNNL and NorthWrite enhanced the tool to increase its flexibility and usability by converting it to a Web-based application. These enhancements eliminated the need for costly equipment and additional software, making the tool less expensive and easier to maintain.

The WBE is the computation engine behind NorthWrite's user interface in the software tool called the Energy Expert. Energy Expert is now the centerpiece in NorthWrite's energy business development efforts. It is offered as part of a suite of diagnostic tools called WorkSite™.

In the past, building operations managers could only track a building's energy consumption through monthly utility bills. With the WBE in Energy Expert, they can identify unexpected changes in energy usage on a consistent basis and at a moment's notice. This ability to continuously monitor energy usage means expensive fluctuations in energy performance can be addressed sooner, resulting in greater energy efficiency and lower energy costs.

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Reflector Compact Fluorescent Lamps Market Transformation Project

Department of Energy
Pacific Northwest National Laboratory

From left: Jeff McCullough, Kathi Ruiz, Linda Sandahl, Marc Ledbetter, Terri Gilbride, Terry Shoemaker

Recessed downlights are among today's most popular lighting fixtures, with an estimated 350 million installed in U.S. homes. The vast majority of these fixtures are fitted with incandescent reflector lamps (R-lamps), which typically draw 65 to 100 watts of power per lamp. Of the estimated 120 to 140 million R-lamps sold in the U.S. each year, roughly half are for residential use. Why are they so popular? Recessed "cans" are relatively inexpensive compared to other types of installed lighting fixtures for the home, and they provide an unobtrusive, directed source of light for kitchens, hallways, and living rooms.

Many incandescent R-lamps can be replaced with reflector compact fluorescent lamps (R-CFLs), which provide similar light output while using just one-third of the energy. In non-airtight cans, screw-in CFLs can replace incandescent lamps for immediate energy savings. However, until recently, few R-CFLs were available in consumer markets. Further, when higher wattage R-CFLs are used in an insulated ceiling-rated airtight (ICAT) recessed can, an additional challenge arises: heat generated by the lamp and ballast can be trapped inside the fixture, and excessive heat can cause lower light output as well as shorter lamp and fixture life spans.

To address the heat challenge, Pacific Northwest National Laboratory's (PNNL) Technology Procurement Program implemented a market transformation project to develop R-CFLs specifically designed for use in ICAT recessed can fixtures that also meet other minimum performance criteria, including minimum light output and size restrictions (to ensure they fit in standard residential recessed cans).

Commercial buildings, such as restaurants, hotels, and multifamily housing facilities, are also sometimes equipped with recessed can fixtures. Apartment buildings and hotels, for example, often use recessed cans in common areas, many of which remain lit for extended hours. Energy use in these applications is reduced significantly by using R-CFLs instead of incandescent reflectors.

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Titanium Metal Injection Molding

Department of Energy
Pacific Northwest National Laboratory

From left: Dr. Scott Weil, Dr. Eric Lund, Eric Nyberg, Kevin Simmons

Titanium has the strength of steel but is 43% lighter, is twice as strong as aluminum, and is more corrosion-resistant than stainless steel. This super-metal is able to withstand attack by acids, salts, chlorine, and sea water, and is highly resistant to metal fatigue. It is the only metal known to display osseointegration, the ability to form a direct structural and functional connection with living bone.

Praxair and Pacific Northwest National Laboratory (PNNL) joined forces in 2006, each bringing a missing piece to the titanium manufacturing puzzle. Praxair, a global Fortune 300 supplier of atmospheric, process, and specialty gases, interested in opening new markets for its gases, brought its knowledge of industry, contacts in the manufacturing world, and financial support to the licensing agreement. PNNL, committed to developing a new titanium manufacturing process with more than $100,000 of internal funds invested, brought its titanium metal injection molding (Ti MIM) process. The Ti MIM process—a quantum leap forward in titanium metallurgy—overcomes barriers of impurity intrusion to enable the cost-effective production of titanium parts that is finally on par with steel and stainless steel manufacturing.

The Ti MIM technology allows small, precision, detailed components to be produced more cost effectively than machining. Machining takes more time to produce a single part and in the process wastes expensive materials, both of which drive up cost. Ti MIM technology allows many parts to be molded at once with very little waste, resulting in significant costs savings. Additionally, the process allows shapes and angles to be molded into parts that would be difficult or impossible to machine. The technology relies on a unique binder that evaporates out of the part quickly and completely without bloating, distorting, or leaving behind residual impurities. The binder makes it possible to produce high-quality titanium parts by powder injection molding, which offers lower cost, higher precision, and faster output than previous titanium parts production methods and can benefit the medical, aviation, transportation, and chemical processing industries currently using titanium components. Applied in a manufacturing process, Ti MIM cuts raw materials requirements and manufacturing time significantly, providing U.S. industries and individuals with all of the benefits of titanium at a fraction of current costs.

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ElectroNeedle™ Biomedical Sensor Array

Department of Energy
Sandia National Laboratories

From left to right: Dr. Brent Burdick, Dr. Kent Schubert, Dr. Chris Apblett, Kerry Kampschmidt, Dr. Paul Smith, Dr. Steve Casalnuovo, Dr. Stanley Kravitz, and Craig Wingate. Not pictured: Dr. Colin Buckley, Jeb Flemming, Dr. David Ingersoll, and Carrie Schmidt.

The ElectroNeedle™ Biomedical Sensor Array is a device that, when pressed against the skin, provides rapid, on-demand, multiplexed, point-of-care biomedical assays for medical diagnosis in emergency, battlefield, and remote settings where time constraints or distance make it impractical to send the patient's samples to a conventional laboratory for analysis. It will also eliminate delays experienced by many patients and physicians when waiting for diagnostic test results. Finally, it will enable a new dimension in home healthcare, where patients can be routinely monitored and the results transmitted to a physician.

By combining electrochemical measurement techniques with well-defined recognition chemistries and an easy-to-use sensor, it is possible to detect a range of biologically important species, including carbohydrates, electrolytes, lipids, enzymes, toxins, proteins, viruses, and bacteria in a patient's blood or cellular fluid. This technology provides a painless and rapid measurement without having to extract fluids for later analysis.

The significance of ElectroNeedle™ technology has been recognized by both the commercial sector and the medical community. Two new biotechnology companies—New Mexico Biotech, Inc., and Life BioScience, Inc.—have been formed in Albuquerque explicitly to commercialize ElectroNeedle™. One company has already licensed the intellectual property (IP) portfolio that became available during 2006, and negotiations are underway with the second. Sandia National Laboratories (SNL) will provide ongoing research into the technology and technical guidance to the licensing organizations. The licensee(s) are expected to develop the commercial product, pursue FDA approval for the product, and provide funding to SNL for continued research and development.

When this technology is fully commercialized, it will revolutionize healthcare worldwide. Not only will it help Department of Defense personnel on the battlefield and provide faster, more accurate healthcare to U.S. citizens and other members of the developed world, it will also provide vast improvements to healthcare in developing nations.

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Secure Sensor and Seal Technologies for Global Nuclear Nonproliferation

Department of Energy
Sandia National Laboratories

From left to right: Dr. Brent Burdick, Barry Schoeneman and Steve Blankenau

Sandia National Laboratories (SNL) transferred the technology for the T-1A optical seal, an active radio frequency-based (RF) device that is used to monitor high-value assets, and its technological successor, the Secure Sensor Platform (SSP). The T-1A seal makes it highly difficult to remove material or containers without breaking the seal on the fiber-optic loop. When the seal is broken, the T-1A transmits the event by RF and an associated monitoring system collects the information for storage and review. These seals are intended for long-term use without maintenance, up to five years on one battery. The device electronics are housed in a plastic case about the size of two decks of cards and can monitor a fiber-optic loop up to 50 meters in length. The T-1A provides periodic state-of-health communications as well as immediate event notification. The device is also capable of message authentication and has active and passive tamper-indicating features.

SNL initiated the partnership by proposing that Canberra Albuquerque commercialize the T-1A and collaborate on development of the SSP. The innovative and creative technology transfer event was to combine a license agreement for the current T-1A sensor with a Cooperative Research and Development Agreement (CRADA) to jointly develop the next-generation SSP sensor. Not only was the current T-1A product brought to market successfully through the licensing of SNL intellectual property, but the CRADA will provide a streamlined commercial launch of the SSP sensor. The transfer for the SSP has been funded entirely by Canberra. The production of the T-1A units is funded primarily by Canberra, with some minimal funding provided by the Department of Energy's Savannah River Site as the domestic customer for the seal. All technology transfer efforts and associated costs in terms of negotiating and executing the CRADA and license agreement were assumed by the Strategic Relationships Center at SNL.

A direct benefit of the T-1A is the extension of the periods between physical taking of inventory. The first increase was from one to two years, and recently the interval was extended to three years. Additionally, daily manual administrative checks have been eliminated because the seals automatically "report in" several times a day. As well as reducing administrative overhead, the T-1A seals enhance security and confidence. People lose confidence in mechanical seals as soon as they are applied because they are not monitored directly and continuously. Active seals—such as the T-1A and the SSP—renew confidence in their security each time they report their status. Also, the two-person rule has been eliminated for material monitored by an active seal system. An additional benefit is the reduction of the radiation dose received by security personnel, who do not need to be physically present with the stored material as frequently.

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Dual Antigen Detection Assay for Syphilis

Department of Health and Human Services
Centers for Disease Control and Prevention

Dr. Arnold Castro

Syphilis is a sexually transmitted disease (STD) caused by the spirochete bacterium Treponema pallidum. Over 100,000 cases of adult syphilis are reported worldwide each year. In addition, syphilis can be transmitted congenitally and it affects more than 3,000 infants annually. A technology invented by the Centers for Disease Control and Prevention (CDC) is directed toward the development of a rapid, point-of-care test for the improved detection of syphilis.

This invention detects nontreponemal antibodies, helping to fill a long-felt need for a combined test detecting both treponemal and nontreponemal antibodies. One of the major technical challenges overcome by this technology is the ability to attach cardiolipin, the nontreponemal antigen, to membrane surfaces. The nonpolar nature of the fatty acid side chains of the cardiolipin antigen imparts a high degree of hydrophobicity to the molecule and makes it difficult to bind to polar surfaces. The present technology provides an approach for modifying cardiolipin so that it can be covalently conjugated to a protein carrier that can be used as a linker to attach to a solid surface without losing its antigenicity.

When combined with the treponemal antigen, this improved method for binding cardiolipin to a solid support enables a rapid test to detect treponemal and nontreponemal antigens in the same assay. This allows rapid testing for syphilis, which is critical so that patients are notified of their infection status immediately, begin treatment promptly, and avoid unknowingly infecting additional sexual partners.

The value of this dual antigen detection assay for the diagnosis of syphilis was readily recognized by the private sector. The CDC's Technology Transfer Office entered into seven commercial evaluation license agreements (CELAs) with three international and four domestic diagnostic reagent manufacturers. This technology has also led to the implementation of two Cooperative Research and Development Agreements (CRADAs) and a nonexclusive patent license agreement. Thus, in addition to its benefits to public health, the technology also gives economic benefits to the private sector by providing a successful commercial product and providing additional jobs and resources directed at this problem.

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TRACeR III-V (NASA-enhanced X-ray Fluorescence XRF Scanner)

NASA
Marshall Space Flight Center

The Marshall Space Flight Center (MSFC) and KeyMaster Technologies, Inc., have collaborated to enhance the company's X-ray fluorescence (XRF) scanners. During the effort, a vacuum capability for the scanners was developed. Prior to this, all available XRF scanners detected only heavier metals because air impedes the detection of weak-return x-rays from lighter ones. When a scanner is operated in a vacuum, however, the detection range is extended to elements of lower atomic numbers—such as aluminum and silicon. High-strength aluminum alloys now can be analyzed easily. Silicon, a major contaminant to some processes, now can be detected before a process is begun, possibly eliminating weld or adhesion problems. Exotic alloys can be evaluated before being placed in service where lives depend on them. Substandard bolts and fasteners can be evaluated at receiving and never allowed to enter operation.

Through a Space Act Agreement, MSFC and KeyMaster Technologies have collaborated to make ground-breaking enhancements to the company's XRF scanners. The resulting product, the TRACeR III-V, is approximately the size of a portable drill and weighs less than 5 pounds. The instrument has opened the door to new markets, and the product is available commercially around the globe. KeyMaster sold two devices abroad before the product was even announced in any news releases.

NASA has become the first to benefit from the handheld device. Already in use in the Space Shuttle program, the technology takes the chemistry lab to the shop floor and to the launch pad, something that was not practical to do before with large products such as reusable solid rocket motors. And with the next-generation vehicles being Shuttle-derived, this technology will continue to benefit the space program for the foreseeable future.

A major new development involves the technology being used in a testing program for high-efficiency vacuums and extraction cleaners. Equipment that passes these tests, which are being used to set carpet/rug cleaning equipment and chemistry performance standards for the entire industry, will receive the Carpet & Rug Institute's Seal of Approval and certification from the Space Foundation.

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Sammy Nabors

Harry Schramm

Not pictured: Bruce Kaiser, Paul Hale

2008 FLC Awards

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.

Phil Allen, Grace Engineered Products

Tom Anyos, Technology Ventures Corporation

Donna Bialozor, National Cancer Institute

Dr. Michelle Booden, National Institutes of Health

James Burns, Naval Surface Warfare Center Carderock Division

Dr. Chekesha Clingman, National Institutes of Health

Donald Dahlheimer, Telemedicine and Advanced Technology Research Center

Pat Dillon, Wisconsin Entrepreneurs' Network

Edward Glaser, Technology Commercialization Center

Mark Langguth, Argonne National Laboratory

Andrew Loebl, Oak Ridge National Laboratory

Betsy Lulfs, Minnesota Department of Employment & Economic Development

Marianne Lynch, National Heart, Lung and Blood Institute

Terry Lynch, National Institute of Standards and Technology

Dr. Shas Mattigod, Pacific Northwest National Laboratory

Dr. Christophe McCray, Office of Naval Research

Margaret McNamara, University of Buffalo

Paul McQuade, Greenberg Traurig, LLP

Susan McRae, Army Space & Missile Defense Command

Dr. Michael Muthig, Concurrent Technologies Corporation

Adaku Nwachukwu, National Institutes of Health

Belinda Padilla, Los Alamos National Laboratory

Brad Parish, Scientific Investments Industrial Development Institute

Keith Quinn, Universal Technology Corporation

Patrick Rodriguez, Air Force Research Laboratory Directed Energy Directorate

David Sikora, Ball Aerospace & Technology Corporation

Maurice Smith, NSA Kansas City Plant (retired)

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

Susan Sprake, Los Alamos National Laboratory

Dr. Thomas Stackhouse, National Cancer Institute

Larry Steele, Skymetrics, Inc.

Mark Surina, The MITRE Corporation

Dr. Joseph Teter, Naval Surface Warfare Center Carderock Division

Kathryn Townsend, Naval Meteorology and Oceanography Command

Diana Tucker, Agricultural Research Service

Tim Wittig, Technology Management Advisors - SAIC

2008 FLC Awards

Laboratory Director of the Year

Dr. R. Ilker Adiguzel

Department of Defense - Army
U.S. Army Engineer Research and Development Center (ERDC)
Construction Engineering Research Laboratory

Director of the Construction Engineering Research Laboratory (CERL) since June 2006, Dr. R. Ilker Adiguzel has held almost every technical position in the laboratory related to infrastructure and environmental sustainability. Dr. Adiguzel brings an extraordinary depth of experience to his current position. That experience, combined with his passionate commitment to dual-use technologies, consistently benefits the military and the public alike.

Dr. Adiguzel has worked hard to build on CERL's legacy of technology transfer by expanding its relationships with academic and private sector partners. His guiding philosophy has been two-fold: first, for CERL scientists and professionals to focus on the most important technology for Army application; and second, to identify and communicate early on with prospective academic and industry collaborators to determine potential commercial standards and applications. This subtle but effective shift in emphasis is helping to ensure that CERL technologies receive the widest possible dissemination among prospective users—which in turn will push continuous development and product improvement, and yield the best possible benefits for the military mission.

Recognizing the importance of protecting Army intellectual property, Dr. Adiguzel has encouraged researchers to file product name and symbol trademarks. CERL is also one of the few federal laboratories to have actively pursued trademark protection. Two of the first trademark licenses in negotiation are those for the web-based Dr.Checks and ProjNet services in 2007.

Under Dr. Adiguzel's leadership, CERL signed 3 new Education Partnership Agreements, 20 interagency agreements, and 9 Memoranda of Agreement or Understanding. CERL also leads Engineer Research and Development Center laboratories in Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) awards, with more than 20 in various stages over the past year bringing in more than $1.5 million in funding to CERL partners.

In summary, CERL's legacy of technology transfer has grown exponentially in the past year due to Dr. Adiguzel's efforts. His active support and encouragement of the technical staff has created an exciting environment that truly integrates technology transfer into all aspects of the laboratory's culture.

Dr. Adiguzel's emphasis on technology transfer has increased outreach to both private industry and academia, and expanded the use of CERL technology tools within the Department of Defense, the federal government, and industry.

Captain Michael Byman, Donald Aker, Dr. Paul Lefebvre

Department of Defense – Navy
Naval Undersea Warfare Center Division Newport

Captain Michael Byman

Donald Aker

Dr. Paul Lefebvre

The 138-year history of the Naval Undersea Warfare Center (NUWC) Division Newport is steeped in the tradition of providing technology for the U.S. Navy's fleet. From its modest beginnings of developing torpedoes and experimenting with undersea acoustics, Division Newport has expanded to become the Navy's full-spectrum research, development, test and evaluation engineering and fleet support center for submarine warfare systems, autonomous underwater systems, offensive/defensive submarine weapons systems, and surface ship sonar systems associated with undersea warfare.

Under the senior leadership of Captain Michael Byman, USN, Commander Division Newport; Dr. Paul Lefebvre, Division Newport Technical Director; and Donald Aker, Division Newport Deputy Technical Director, technology transfer continues to be a major component to the overall science and technology thrust at the facility. For example, they championed the creation of the Technology Partnership Enterprise Office (TPEO) in 2006. A goal of TPEO was to seek out opportunities and establish the appropriate partnership and business agreements to bring new and beneficial technology to the fleet. Since its establishment, TPEO has continued to meet that goal, with the signing of 22 Cooperative Research and Development Agreements (CRADAs) and amendments totaling $1.8 million.

Division Newport's leadership has made a special effort to reach out to the medical community, realizing that many of the technologies under development may have applications in health care and medical research. As a result, the groundbreaking digital image enhancement (DIE) technology has been successfully transferred and commercialized under a patent license agreement with Advanced Image Enhancement, Inc. Originally used to help sailors identify mines in a cluttered underwater environment, DIE uses mathematical functions called wavelets to help doctors detect tissue anomalies and interpret digital mammograms. With DIE in place at hospitals and clinics across the nation, doctors will be able to refine and enhance regions of concern within mammography images to improve the detection of cancer in its early stages.

The Division Newport leadership team's staunch support of technology transfer is also evident in their holistic and far-reaching approach to fostering an environment rich in technology transfer opportunities. A prime example of this is their active participation in many internal technical talent pool development initiatives. These initiatives focus on the personal and collective growth of Division Newport scientists and engineers to make their careers more rewarding and to ensure that Division Newport is capable of fulfilling its undersea warfare mission. Initiatives include diversity summits, career enhancement opportunities, electronic communication tools, and the development of a Career Path Planning Guide.

Joe Sciabica

Department of Defense – Air Force
Air Force Research Laboratory, Sensors Directorate

Joe Sciabica was named director of the Air Force Research Laboratory (AFRL) Sensors Directorate (RY) in May 2005. Since beginning his career with the Air Force in 1982 as a program manager at the Air Force Rocket Propulsion Laboratory, he has held a variety of assignments with progressive responsibility in both management and technical leadership. As he rose through the ranks, his accumulating experience reinforced his belief that technology is a contact sport, not an intellectual exercise. As he says, "Take a risk. Get your fingernails dirty, feel the technology and go build something." That philosophy serves him well as he works to build collaborations and partnerships that bring together researchers, private industry and academia to work on some of the most pressing needs of the country's warfighters.

Mr. Sciabica became director of RY at a crucial juncture. Created in 1997 when RY-predecessor organizations in three separate locations were consolidated at Wright-Patterson Air Force Base (WPAFB), the directorate was significantly affected by 2005 base realignments and closures. Over the next few years, all of the Air Force's sensor research programs will be co-located at RY, making it the world's premier site for advanced sensor technology. To guide that transformation, Mr. Sciabica developed what he calls the "layered sensing vision," in which all sensor technologies in an environment have the capability for integrated communication, creating a "sensor web." With Mr. Sciabica's layered sensing vision serving as the touchstone for technology development and commercialization, the role of technology transfer has been dramatically elevated within RY.

The changes in process and the increased visibility of the benefits that technology transfer offers the directorate are increasing its numbers of completed CRADAs. In 2007, RY entered into 10 CRADAs, doubling its active number to 20. Two Patent License Agreements (PLAs) were signed, one an exclusive license and one nonexclusive. Other agreements include 13 Education Partnership Agreements (EPAs), four of which were signed this year; and one Assignment on an Invention to the University of Connecticut.

Another of Mr. Sciabica's accomplishments is the establishment of the Tec^Edge Innovation and Collaboration Institute. Tec^Edge offers a neutral environment in which multidisciplinary teams can come together in intense collaborations to focus on some of the nation's most challenging and pressing issues. Tec^Edge was launched in January 2007 and is an operational element of the Wright Brothers Institute. The AFRL and the Dayton Region are its foundational stakeholders; participants come from military, government, academia and industry. Their interactions take place via developmental sessions, solution forums, resident teams and rapid reaction/prototyping teams. Since its launch, nearly 2,000 individuals have participated in Tec^Edge collaborations.

2008 FLC Awards

Service Awards

Edward Linsenmeyer

Department of Defense – Navy
Naval Surface Warfare Center, Panama City

Harold Metcalf Award

Ed Linsenmeyer's commitment to the field of technology transfer has driven his tireless service to his own laboratory, the Navy and, quite notably, the FLC. The FLC and the entire technology transfer community have reaped tremendous rewards from his concentrated efforts and exemplary leadership.

Mr. Linsenmeyer's involvement with the FLC spans more than 15 years. During that time he has served as Southeast Region Deputy Regional Coordinator, followed by two terms as the Regional Coordinator. As Regional Coordinator, he initiated a partnership between the FLC and Rehabilitation Engineering Research Centers to identify technologies in federal laboratories that could be transferred and applied to meeting the needs of people with mobility, communication, and other physical disabilities.

Mr. Linsenmeyer then moved on to become Vice-Chair of the FLC. In this capacity, and later as FLC Chair, he provided the calm and steady presence that enabled productive discussions and positive decision making.

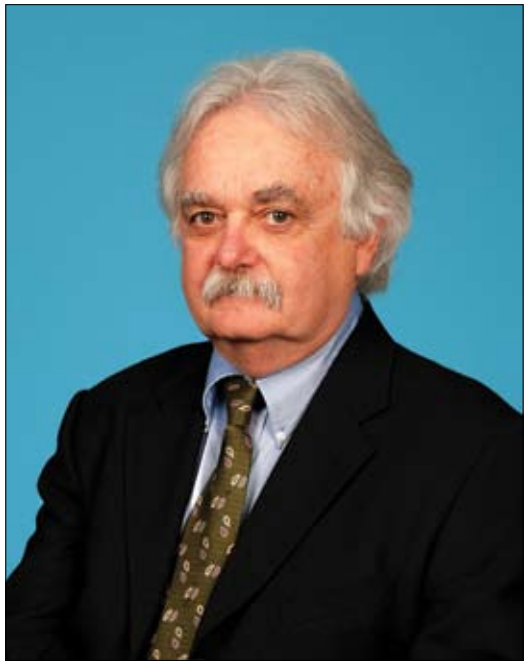
The FLC has long emphasized member training and recognition of technology transfer accomplishments by scientists at federal labs. This internal focus is important, but Mr. Linsenmeyer understood that the next necessary step in the growth of the organization would come through outreach. He began a concentrated effort to communicate and work with other technology transfer organizations, such as the Association of University Technology Managers, the International Society for Optical Engineering, and the Industrial Research Institute. The World's Best Technology (WBT) Showcase perfectly exemplifies an outreach effort nurtured to great success by Mr. Linsenmeyer. What began as a concept in the early 2000s is now an unparalleled, deal-focused forum that brings together investors, licensees, and technology transfer professionals. Showcased technologies are selected by and presented to established venture investors and Fortune 500 licensing scouts representing a spectrum of industries. All presenters are coached in making concise, investor-oriented presentations geared toward securing investment capital or licensing partners. According to the WBT website, the forum "offers a level playing field for participating universities and labs to present the highest quality opportunities free of sector limitations or political agendas."

Mr. Linsenmeyer has worked tirelessly to resolve conflicts, foster consensus, and encourage participation in the FLC for newcomers and veterans alike. His advocacy of the FLC at numerous events has generated renewed visibility for the organization among scientific and professional associations, within Congress, among high-level federal agency managers, and in industry.

Dr. Stephen Lieberman

Department of Defense – Navy
Space and Naval Warfare Systems Center, San Diego

Representative of the Year Award



As Head of the Office of Research and Technology Applications (ORTA) for the Space and Naval Warfare Systems Center – San Diego (SSC San Diego), Dr. Stephen Lieberman is leading federal technology transfer in new directions, as a mentor to young business and research professionals and through his ambitious schedule of outreach to industry nationwide and local entrepreneurs.

His influence is magnified through his other role as the Technical Program Manager for the Center for Commercialization of Advanced Technology (CCAT), a congressionally supported program to promote public-private partnerships between industry, academia, and government that is focused on commercializing early-stage technologies with applications for the Department of Defense and the Department of Homeland Security.

Dr. Lieberman's many contributions to technology transfer have had positive, real-world outcomes far beyond SSC San Diego, through his interwoven connections with other government entities, private businesses, and universities. His leadership in federal outreach to industry is recognized by his peers, with his recent election as Far West Regional Coordinator—representing more than 75 federal laboratories and facilities in 8 western states (i.e., Alaska, Arizona, California, Hawaii, Idaho, Nevada, Oregon and Washington).

Dr. Lieberman's energetic promotion of technology transfer programs has significantly expanded ORTA and CCAT efforts at SSC San Diego. As ORTA, he facilitates the commercialization of technologies developed by SSC San Diego and manages a portfolio of approximately 400 patents and patent licenses. Since he began in 2004, technology transfer funding handled annually in the ORTA office has risen from about $20,000-$40,000 to this year's potential for multimillion-dollar agreements in their final stages.

Dr. Lieberman does not focus solely on building innovative, nontraditional collaborations between industry and federal laboratories. Looking toward the future, he also assures the continued vitality of technology transfer through his extensive efforts to educate tomorrow's investors and inventors. At CCAT, he implemented the successful Student Intern Program, which gives graduate students from the University of California and San Diego State University the opportunity to learn technology transfer up close with real Navy inventions as examples.

Dr. Lieberman's ongoing collaborations with the diverse communities so essential to successful commercialization—from inventors in federal labs to local manufacturers—are leading federal technology transfer in productive directions. His farsighted emphasis on building opportunities for future inventors and investors addresses the much-noted need for a more globally competitive U.S. technology sector, as well as for enhanced capabilities in national security.

Interagency Partnership Award

The technology transferred during this project was a new type of robotic crane, the Aerial Multi-axis Platform (RoboCrane/AMP), which originally was developed at the National Institute of Standards and Technology (NIST). The RoboCrane/AMP uses six computer-controlled hoists and cables to stabilize and maneuver suspended cargo. The cables are directed through three pairs of pulleys mounted in a triangular configuration to a ceiling or overhead gantry. The cables descend inward from the pulleys and attach to a much smaller suspended frame onto which a platform or tool can be attached. The RoboCrane/AMP features stable control over the position, orientation, and velocity of a suspended platform. The computer control system automatically adjusts cable lengths to maneuver the suspended platform through a large work volume underneath the pulley triangle. The operator can intuitively drive the platform from a single joystick.

The initial recipient of the transferred technology was the Warner Robins Air Logistics Center (ALC). The first RoboCrane/AMP systems were installed in its hangar used for de-painting cargo aircraft such as the C-130 and C-141. Additional RoboCrane/AMP systems are being installed in a new hangar for the C-5, the largest aircraft in the fleet.

The need for this technology was clear. De-painting and maintaining large aircraft have always posed problems for workers, especially when trying to access elevated surfaces. The existing floor-based equipment used to position personnel, sometimes called "shooting booms" or "cherry-pickers," is difficult and time consuming to maneuver. Scaffolding, hoses, and other ground clutter also inhibit efficient movement around the aircraft, which increases the overall flow-time of the aircraft in the de-paint process. Recent changes in environmental regulations have reduced the use of chemical solvents and increased the need for abrasive blasting techniques, which lead to increased operator fatigue and injury for workers wearing breathing apparatus in dust-filled hazardous environments.

Each organization on the project team played a critical role in making the overall project successful. The Air Force Research Laboratory (AFRL) provided funding for the project and organized the various team members. NIST provided the general technical expertise to implement the RoboCrane/AMP research for this application. U.S. Technology Corporation, a supplier of plastic media blasting equipment, provided the critical expertise necessary to adapt the RoboCrane/AMP for aircraft maintenance and essential insights into the ergonomic design of the system to allow safe and intuitive operator control of the process. The corporation also provided critical new blasting equipment and techniques that allowed use of simultaneous nozzles to drastically increase overall de-paint efficiency and facilities to perform harsh environment testing. In addition, U.S. Technology purchased all system components and helped fabricate and install the prototype. It has since licensed the applicable patents from NIST, and has built and installed production units.

David Goldheim

Department of Energy
Sandia National Laboratories

Outstanding Technology Transfer Professional Award

David L. Goldheim joined Sandia National Laboratories' Technology Transfer Office as its director in 1999. His significant contributions include leadership, inventiveness, and tenacity in developing and shepherding innovative programs that support Sandia's business development and strategic intellectual property (IP) management efforts. During his tenure, the partnering processes at Sandia have matured, as well as expanded into new and innovative areas.

Mr. Goldheim's model of strategic IP management emphasizes identifying existing IP and not-yet-market-ready technical capabilities; then, with the capabilities and the existing IP bundled, using an inventive set of tools to bring the technology from the lab to the marketplace. This strategy requires trust and support among the research institutions to identify a lead lab negotiator and a royalty distribution approach, as well as business savvy to represent the interests of multiple parties.

Intellectual property professionals recognize the value of this model. Members of Sandia's team took the bundling concept outside the walls of the lab in 2006 and received a Licensing Executives Society "Deals of Distinction" award, which recognizes transactions involving the licensing and transfer of intellectual property. Sandia, Los Alamos National Laboratory, the University of New Mexico's Science & Technology Corp., New Mexico State University, New Mexico Institute of Mining and Technology, the MIND Institute, and the National Center for Genome Resources forged an inter-institutional agreement that improves access to technology and eases the complexity of negotiating license agreements by forming a contract that allows the bundling of patents and identifies one organization as responsible for negotiations.

Other examples of Sandia's use of innovative mechanisms include the Business Intelligence/ Market Research team, Equity and Royal Sharing programs, Technology Maturation Fund, Mission-Centric Venturing, Entrepreneur-in-Residence, Sandia Science & Technology Park, Shared Vision program, business development, business intelligence, and market research.

Mr. Goldheim's qualifications as a technology transfer professional are indisputable. He demonstrates business acumen and specific skills in technology transfer in his capacity as Sandia's lead representative in establishing and maintaining strategic relationships that support the laboratories' crucial national security missions.

2008 FLC Awards

Honorable Mention

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

Department of Agriculture
Agricultural Research Service, Mid South Area
"Improved Oxygen Management in Channel Catfish Hatcheries"
"Transfer of Green-Cane Production of Best Management Practices"
"Ventilation and Nutritional Guidelines for Commercial Broiler Grown to Heavy Weights"

Agricultural Research Service, Midwest Area
"Biobased Hot/Cold Rolling Oil in Metalworking Industry"
"Improved Green Industry Crop Production Through Enhanced Research Communication"

Agricultural Research Service, Pacific West Area
"For Sustained Technology Transfer Excellence Contributing to Enhanced Foreign Market Access for U.S. Tree Fruit"
"For Development and Transfer of Technology Related to Guayule"
"For Registration of a Phytosanitary Irradiation Treatment Protocol"

Agricultural Research Service, South Atlantic Area
"Charleston Greenpack, a New Southernpea Cultivar with Persistent Green Seed"
"GIS-Model for Hurricane Spread of Citrus Canker for Regulatory Intervention"
"Technology for the Environmentally Sustainable Treatment of Livestock Manure"

Beltsville Agricultural Research Center
"The Ground Beef Calculator"

Department of Defense – Army
Natick Soldier Research Development & Engineering Center
"Self Heating 'Kitchen in a Carton' for Remote Feeding Situations"

U.S. Army Edgewood Chemical Biological Center
"All Hazard Receipt Capability"

Department of Defense – Navy
Naval Surface Warfare Center Carderock Division
"Threat Containment Unit"

Department of Defense – Air Force
Air Force Research Laboratory
"Vehicle Halting Systems"

Air Force Research Laboratory, Human Effectiveness Directorate
"AFRL Bioscience Collaboration with University of Cincinnati"
"Biomarker Discovery and Biomonitor Device Development"
"Innovative Facilities CRADAs Offering Significant Benefit to Government and Industry"

Department of Defense – Army & Department of Energy
Army Research Laboratory & National Energy Technology Laboratory
"Commercialization of Cast Steel Armor for Department of Defense"

Department of Energy
Argonne National Laboratory
"Near-Frictionless Carbon Coatings"

Idaho National Laboratory
"Tactical Timed Firing Device"

Lawrence Livermore National Laboratory
"Durable Silver Reflector for High Efficiency Solar Cells"

Oak Ridge National Laboratory
"Automated Image Retrieval"
"IC-221M Cast Nickel Aluminide for Improved Heat-Treating Furnace Performance"
"Rail-to-Rail Operational Amplifiers for Harsh Environments"

Pacific Northwest National Laboratory
"Integrated Cargo Container Control (IC3) System"

Princeton Plasma Physics Laboratory
"Miniature Integrated Nuclear Detection System"

Sandia National Laboratories
"Computational Analysis Tools for Goodyear Assurance Tires – Featuring TripleTred Technology"
"Self-Assembling Process for Fabricating Tailored Thin Films"

Department of Health & Human Services

Centers for Disease Control and Prevention
"Maxforce® Tick Management System"

National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases
"Targeted Treatment for Chronic and Painful Diseases"

NASA
Glenn Research Center
"A Compact Non-invasive Device for Early Detection of Cataracts"

Goddard Space Flight Center
"Goddard's SpaceWire Link and Switch ("Router")"

John F. Kennedy Space Center
"Liquid Galvanic Coatings for Protection of Imbedded Metals"

Marshall Space Flight Center
"Auto-Adjustable Pin Tool for Friction Stir Welding"

Honorable Mention | Service Awards

The FLC recognizes the following nominee for his longstanding service and support.

Dr. James Kearns
Department of Defense – Air Force
Air Force Research Laboratory, Human Effectiveness Directorate

Honorable Mention | Outstanding Technology Transfer Professional of the Year

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

Department of Defense – Navy
Paul Fritz
Naval Air Warfare Center Aircraft Division

Dr. Charles Schlagel
Naval Medical Research Center

Department of Energy
R. Diane Newlon, National Energy Technology Laboratory

NASA
HHT Team (Nancy Pekar, Enidia Santiago-Arce, Laura Schoppe)
Goddard Space Flight Center

Ted Mecum
Goddard Space Flight Center

Honorable Mention | Interagency Partnership Award

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

Air Force Research Laboratory and Federal Aviation Administration
Ames Laboratory and National Institute of Justice
Grain Marketing and Production Research Center and Centers for Disease Control and Prevention

2008 FLC Awards

Regional Award Winners

The FLC congratulates the following FLC regional award winners who were recognized in 2007.

Far West Region

Laboratory Representative of the Year
Ida Shum
Idaho National Laboratory

Outstanding Technology Development
Idaho National Laboratory
"Syngas Generation from Co-electrolysis (Syntrolysis)"

Outstanding Technology Development
Lawrence Livermore National Laboratory
"Dielectric Wall Accelerator for Proton Therapy" (also a 2008 FLC national award winner)

Outstanding Partnership
Idaho National Laboratory
Baard Energy

Hybrid Plasma Reactor for Production of Nanoparticles
Idaho National Laboratory
PPG Industries, Inc.

Outstanding Commercialization Success
Lawrence Livermore National Laboratory
"Fission Meter: A High-Sensitivity, Advanced Portable Neutron Source Identification System" (also a 2008 FLC national award winner)

Lawrence Livermore National Laboratory
"Durable Silver Reflector for High Efficiency Solar Cells"

Pacific Northwest National Laboratory
"The Morning Report"

SSC San Diego/Omega Sensors, Inc.
"MEMSUSA"

Pacific Northwest National Laboratory
"Grid Friendly™ Appliance Controller for Grid Frequency Monitoring and Stabilization"

Far West & Mid-Continent Regions

Distinguished Service Award
George Linsteadt, founder and first FLC Chair

Notable Technology Development
Sandia National Laboratories
"TufFoam™"

Award of Appreciation
Edward Linsenmeyer
Naval Surface Warfare Center, Panama City (also a 2008 FLC national award winner)

Patrick Rodriguez
Air Force Research Laboratory

Mid-Atlantic Region

Excellence in Technology Transfer Award
National Energy Technology Laboratory
"High-Temperature Sorbent to Control Mercury in Gasification Processes" (also a 2008 FLC national award winner)

National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases
"Targeted Treatment for Chronic and Painful Diseases"

Naval Research Laboratory
"Transparent Spinel Ceramic Armor" (also a 2008 FLC national award winner)

Outstanding Technology Transfer Professional
Paul Fritz, Naval Air Warfare Center Aircraft Division

Mid-Continent Region

Outstanding Achievement in the Mid-Continent Regional Award Program
Air Force Research Laboratory – Kirtland AFB
Ames Laboratory
Los Alamos National Laboratory
NASA Johnson Space Center
Rocky Mountain Oilfield Testing Center
Sandia National Laboratories
State of New Mexico
USDA Agricultural Research Service Northern Plains Area

Notable Technology Development
Air Force Research Laboratory
"Junior Force Vehicle Stopper Program"

Los Alamos National Laboratory
"RaveGrid: Raster-to-Vector Graphics for Image Data"

Outstanding Laboratory
Ames Laboratory, Department of Energy

Outstanding Partnership
University of New Mexico and Los Alamos National Laboratory
"New Mexico Center for Isotopes in Medicine"

Excellence in Technology Transfer Award
Sequoia Technologies and Air Force Research Laboratory

Sandia National Laboratories
"Electroneedle™ Biomedical Sensor Array" (also a 2008 FLC national award winner)

Willowstick Technologies, LLC and Rocky Mountain Oilfield Testing Center
"AquaTrack"

Outstanding Laboratory Representative
Cal Thorson
USDA ARS Northern Great Plains Research Laboratory

Distinguished Service
John E. "Jack" James
NASA Johnson Space Center

Award of Appreciation
Debra Covey
Ames Laboratory

Midwest Region

Excellence in Technology Transfer Awards
Air Force Research Laboratory, Human Effectiveness Directorate
"Biomarker Discovery and Biomonitor Device Development"

Argonne National Laboratory
"Near Frictionless Carbon Coatings"

Glenn Research Center
"Secure Mobile Networking for Space Communication, National Security & Commercial Products"

Regional Coordinator's Excellence Award
Dr. James Kearns
Air Force Research Laboratory, Human Effectiveness Directorate

Partnership Award
Air Force Research Laboratory, Human Effectiveness Directorate and University of Cincinnati

Northeast Region

Excellence in Technology Transfer Award
Princeton Plasma Physics Laboratory
"Miniature Integrated Nuclear Detection System"

Regional Laboratory Award
Naval Undersea Warfare Center Division Newport

Southeast Region

Project of the Year
Oak Ridge National Laboratory
"IC-221M Cast Nickel Aluminide for Improved Heat-Treating Furnace Performance"

Laboratory Representative of the Year
Edward Linsenmeyer, Naval Surface Warfare Center, Panama City (also a 2008 FLC national award winner)

Excellence in Technology Transfer Awards
Marshall Space Flight Center
"The TRACeR III-V Scanner Detects Lighter Elements" (also a 2008 FLC national award winner)
"Maxforce® Tick Management System"

Oak Ridge National Laboratory
"Automated Image Retrieval: Semiconductor-Specific Image Retrieval Method and System"
"High-Performance Lanthanum Manganese Oxide-Enabled, High Temperature Superconducting Tape" (also a 2008 FLC national award winner)
"World's First Rail-to-Rail Operational Amplifiers for Harsh Environments"

Savannah River National Laboratory
"Multi-Layered Protective Film for Isolator Systems 'ProTec Tear-Offs™' "
"RadRope™ Nuclear Material Detection System"

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
- Laboratory Director of the Year
- FLC Service Awards
  - Harold Metcalf Award
  - Representative of the Year Award
  - Outstanding Service Award
- Outstanding Technology Transfer Professional Award
- Interagency Partnership Award

The following timeline reflects the awards program's 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 as needed.

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.

2008 FLC Awards