FLC
NATIONAL MEETING

AWARDS

APRIL 26, 2017
SAN ANTONIO

Spurring Innovation Through Technology Transfer

AWARDS SUMMARY

FLC
Federal Laboratory Consortium for Technology Transfer

Promoting, Educating and Facilitating Technology Transfer

Formally chartered by the Federal Technology Transfer Act of 1986, the Federal Laboratory Consortium for Technology Transfer (FLC) is a nationwide network of over 300 federal laboratories, agencies and research centers that fosters commercialization best practice strategies and opportunities for accelerating technologies out of the labs and into the marketplace. The American taxpayers' investment in our federal laboratories' research and development (R&D) efforts has spurred scientific and technological breakthroughs that can return dividends for our economy—such as creating new industries, businesses and jobs—when introduced to the marketplace.

The FLC's mission is to promote, educate, and facilitate federal technology transfer (T2) among its member labs and institutions, and create a social and economic impact with new innovative technologies. Through the various resources, events, education and training, tools, and services the FLC creates and provides for members throughout its six regions and on federallabs.org, our federal laboratories are better able to create partnerships, navigate the commercialization process, and achieve market success.

By serving as the touchstone for technology transfer communication, education, and open data services tools, the FLC plays a central role in providing the skilled tech transfer workforce that our country needs. These highly motivated tech transfer professionals are the driving force behind improving the ability of federal labs to partner effectively with the private sector. The FLC strives to support the dedicated individuals who make up the federal laboratory system by continuing to serve as a gateway for industry, government, and academia to access R&D and stimulate our nation's economic health.

MESSAGE FROM THE AWARDS COMMITTEE CHAIR

Welcome to the 2017 FLC National Awards Ceremony

Thank you for attending the 2017 FLC national awards ceremony. The FLC's annual awards program is one of many avenues used to advance the Consortium's goal of fostering and promoting the economic and societal benefits of federal laboratory technology. This event is an opportunity to publicly honor exceptional federal technology transfer professionals and their partners who diligently work together, much of the time, behind the scenes—in laboratories, in office cubicles, onsite at a farm or a factory—without fanfare or cheers.

The theme of this year's national meeting is "Spurring Innovation Through Technology Transfer," and this publication features numerous examples of unique and useful technologies that are making an immediate commercial impact thanks to the collaborative efforts of federal scientists and engineers, technology transfer professionals, and their partners.

In 2016 the FLC embarked on a new avenue to demonstrate the technologies and capabilities of the federal labs within a particular task area. We are pleased to introduce a new awards category this year: the FLC Executive Board Technology Focus Award.

The FLC 2017 national awards are presented in the following categories:

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

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

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

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

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

FLC Service Award/Outstanding Service Award – recognizes an individual who is not an FLC laboratory employee for a notable contribution to the FLC in terms of sustained support and service.

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

Executive Board Technology Focus Award – this newest award is presented to a laboratory that has most successfully completed a transfer effort of a featured technology under the designated initiative for that year. The inaugural award will recognize water-related technology transfer.

The FLC awards are a prestigious honor in the technology transfer world, with dozens of federal laboratories and agencies submitting nominations each year. These awards are highly esteemed by the federal laboratories, their government agencies, and partners. The experience, expertise, and resources of the award winners displayed on the following pages are impressive. I am extremely proud to present the recipients of the 2017 FLC national awards.

Congratulations to the winners.

Donna Bialozor
Awards Committee Chair

EXCELLENCE IN TECHNOLOGY TRANSFER AWARDS

FLC NATIONAL AWARDS

Elkton Potato

U.S. Department of Agriculture - Agricultural Research Service
Genetic Improvement for Fruits and Vegetables Laboratory

The Elkton potato variety was developed and released as a variety suitable for processing into potato chips from warm temperature growing areas. Potatoes are a cool season crop. The number one potato chipping variety, the Atlantic, is susceptible to internal heat necrosis when grown in warm temperature environments such as the southeast. Internal heat necrosis is a physiological disorder of tubers characterized by dark brown patches of necrotic tissue in the tuber flesh. Tuber loads are sampled prior to going into the processing plant holding area, and if more than 5% of the tubers have internal defects, processors will reject the entire load. Potato growers in the southeastern U.S. and other high temperature growing areas are at economic risk due to internal heat necrosis. It is estimated that 11% of the southeastern acreage of the Atlantic is lost annually due to internal heat necrosis, although this has ranged from 0 to 40% depending on the year. Elkton is highly resistant to internal heat necrosis and produces larger yields than Atlantic when grown in warm temperature environments.

Elkton Potato Plants

Elkton Potatoes

Potato growers in the southeastern U.S. are the prime recipients of the Elkton potato. In order to provide these farmers with planting material, the laboratory entered into a Cooperative Research and Development Agreement (CRADA) with Daniel Corey Farms, which provided funds, expertise, facilities and labor to produce disease-free planting material for large-scale evaluation and eventual commercial sales. In 2014, Daniel Corey Farms received a license to provide certified (i.e., disease-free) planting material to growers for commercial production. Seed was sold to potato growers in California, Texas, Missouri, Florida and North Carolina, and these growers subsequently sold their potato crop to chip processors.

The subsequent harvest from those growers was processed into potato chips. Approximately 18,300 acres of potatoes are grown in Florida for the chip processing industry. On a yield basis alone, Elkton will generate approximately $651 more per acre than Atlantic in the state.


Left to right: John Gaudet, Dr. Robert Griesbach, James Poulos, III, Daniel Corey

Not pictured: Dr. Kathleen Haynes, Dr. Gail Wisler

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Chip-Scale Sensor Invention with Vast Applications: Maximizing Transfer to Industry

Department of Commerce
National Institute of Standards and Technology

As a result of innovation developed at the National Institute of Standards and Technology (NIST) and in collaboration with partners in the industry, the flexibility and reduced manufacturing cost of miniature vapor cells have enabled the commercialization of a wide range of applications, including clocks, gyroscopes, and magnetometers for use in navigation, GPS-backup, and medical purposes. Dr. John Kitching of NIST invented and patented a chip-scale sensor technology, and ever since he has worked with industry to apply his chip-scale sensor invention into the world's first miniature commercial atomic clocks, first miniature commercial atomic magnetometers, and first commercial chip-scale atomic vapor cells.

While sensors based on clouds of atoms excited by lasers have been under development for the past two decades, they are almost always large, tabletop research experiments, unsuitable for virtually all field applications. Dr. Kitching's work led to the development of miniature devices, including an atomic clock the size of a grain of rice. The devices based on the NIST invention can be mass-produced for use in widespread technological tools.

Due to the wide interest and need by industry for access to this revolutionary innovation, NIST made the technology available for use to meet its objectives to ensure that the potential for the technology is met in each of the various applications. As with many of NIST's inventions, this chip-scale sensor technology was an early-stage innovation, and Dr. Kitching devoted an extraordinary amount of time and effort to transfer the fundamental innovation to industry. This commitment to collaborating enabled research partners to commercialize Dr. Kitching's innovations into these products. Without Dr. Kitching's invention and his consistent efforts to communicate the details of his work and know-how to industry, this technology would likely not have been adapted to so many applications that benefit the public. This exceptional technology transfer activity exemplifies the essence of NIST's mission to work with industry to promote industrial competitiveness and further the forefront of technology to benefit the public.


NIST physicist John Kitching displays the heart of the world's smallest atomic clock. This "physics package" is about the size of a grain of rice.


The NIST Atomic Devices and Instrumentation Group

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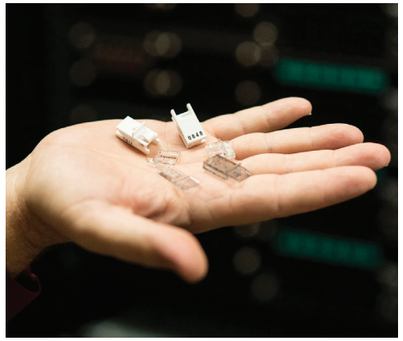
NSA Port Protection Technology

Department of Defense
National Security Agency

Gary Mosholder at the server installing port protectors.



Port protectors developed by NSA and commercialized by PadJack, Inc., secure exposed ports, providing cyber defense at the physical level.

Left: Linda Burger

Not pictured: Jim Bolain, Gary Mosholder, Karen Presley

While organizations focus on firewalls and security software, a multitude of open network ports on computers, routers, servers and Voice over Internet Protocol (VoIP) phone jacks in public and seemingly secure areas remain vulnerable to covert extraction of data and the introduction of damaging malware. The National Security Agency's (NSA) data port protection technologies for Ethernet (RJ45), USB, and video (D-sub) ports provide an innovative layer of defense against this often overlooked vulnerability. Invented by NSA innovator Gary Mosholder, the port protectors cannot be removed once inserted into a port without resulting in visual evidence of tampering, a critical feature for true system security in defense of the warfighter. Soldiers overseas must know without a doubt that the devices they receive are safe to use.

Mosholder began developing the port protection technologies in 2010 for government users. After a commercial market review led him to PadJack, Inc., and its RJ45 locking seal, the NSA Technology Transfer Program (TTP) activated a standard nondisclosure agreement to allow intellectual property-protected collaboration with Jim Bolain, PadJack CEO, to enhance the foundational PadJack technology. The partnership resulted in an improved product patented by NSA and shared throughout the Department of Defense (DOD). As demand grew, the NSA TTP recognized the need for a more efficient direct purchase avenue for government users, as well as the technologies' broader commercialization potential, and began licensing negotiations with PadJack, Inc. To date, three nonexclusive patent license agreements have been signed for patented and patent-pending technologies: the locking seal for data ports (RJ45), signed in July 2013; the USB port protector, signed in July 2014; and the D-sub port blocks and other technologies, signed in August 2015.

These successful technology transfers have exceeded the expectations of both partners. Commercialization of NSA technology has resulted in five new products for PadJack, which have transformed the company with increased sales, a growing workforce, and new manufacturing capabilities, and established it as a market leader with unique, groundbreaking solutions.

For NSA, transfer of the port protector technologies provides an additional layer of information assurance defense at the physical level for securing systems that handle classified and other highly regulated, critical data. In addition, the NSA TTP staff moved from a "one size fits all" licensing model to a scalable model that opens the way for leveraging opportunities presented by small businesses and, ultimately, moving more NSA patented technologies from the lab to the marketplace.

Today, every branch of the military, the intelligence community, and leading-edge firms serious about their information assurance security posture are using PadJack products.

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EXCELLENCE IN TECHNOLOGY
TRANSFER AWARD

Hemostatic Bandages

Department of Defense
Uniformed Services University of the Health Sciences

Controlling hemorrhage is the initial step in first aid, surgery and field trauma care. The transferred hemostatic bandage technology, co-invented by researchers at the Uniformed Services University of the Health Sciences (USU) and Virginia Commonwealth University (VCU), is a formulation and manufacturing technique for the production of hemostatic bandages comprised of dextran, salmon fibrinogen, and salmon thrombin. The bandages are created through a process of electrospinning dextran and adding fibrinogen and thrombin to the resulting dextran fibers, creating a matrix that promotes hemorrhage control. These fibrin-based dressings provide effective hemostasis in a large-animal model of arterial injury. The use of salmon-derived coagulation proteins allows the manufacture of an effective fibrin bandage at a low cost, and the salmon proteins may enhance healing.

The patented technology provides the base for the platform technology called FASTCLOT® and the subsequent SURGICLOT® hemostasis products developed by St. Teresa Medical, Inc., the licensee of the technology. Dr. Stephen Rothwell, USU scientist and co-inventor of the technology, notified the Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc. (HJF) about the development of the technology and the entrepreneur who was interested in licensing the technology. In addition, Dr. Rothwell connected the HJF with the academic co-owner of the technology. John E. Baker contributed to the transfer of the technology by facilitating the agreements that permitted HJF to negotiate the related technology agreements. Dr. Mark Scher led the negotiations for the agreements that transferred the technology to St. Teresa Medical.

The transfer of the hemostatic bandage technology employed multiple technology transfer mechanisms, including inter-institutional agreement, nondisclosure agreements, an exclusive license agreement, and a Cooperative Research and Development Agreement. The unique aspect of this transfer was the ability of multiple parties to execute multiple agreements, all within a year and while protecting numerous interests (U.S. Government, academic, nonprofit, and commercial).

The original technology supported the USU mission of serving warfighters in that it was developed to treat battlefield trauma. In transferring this technology to St. Teresa Medical, which has developed a platform technology for hemostatic bandages, USU has supported research and a technology that benefits public health and the common good, as well as supporting the development of a successful startup company.

Left to right: Jeb Baker, Dr. Stephen Rothwell, Dr. Mark G. Scher

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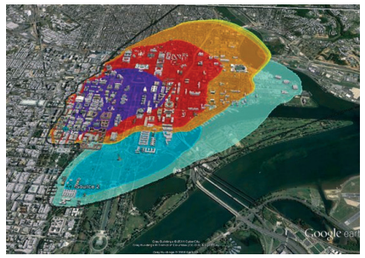
CT-Analyst® - Air Plume Contamination Crisis Management System

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

The U.S. Naval Research Laboratory (NRL) has developed an instantaneous crisis management system that provides more timely and readily comprehensible information to emergency responders. This Navy-patented system, known as Contaminant Transfer Analyst (CT-Analyst®), uses detailed urban geometry and airflow data that can be computer-manipulated to predict the potential impact of urban air plume contamination more quickly than other similar modeling systems. Chemical, biological, or radiological (CBR) explosions can release toxic gas plumes, whether by accident or as a result of terrorism. Statistically, three-fourths of fatalities result from the direct exposure to CBR contaminants within the first 15 minutes of an event, making emergency response times critical. If an effective response begins within 3 to 5 minutes, an estimated 85 percent of those fatalities could be avoided.



A screen shot of CT-Analyst® showing the plumes (solid pink) along with arrival times (colored contour lines) for two plumes released near the port area of Hamburg, Germany.

Bottom row, left to right: Amanda Horansky-McKinney, Kendra Flowers, Patricia Doutriaux. Top row, left to right: Adam Moses, Dr. Gopal Patnaik, Keith Obenschain. Right: Cameron Childs. Not pictured: Dr. John Dennis.

CT-Analyst® gives first responders a key advantage, allowing them to spend less time calculating response needs and more time saving lives. The system's database "imagines" every possible scenario, including where you are on the street, where the fire trucks are headed and, more importantly, where you can set up a triage zone or whatever else is needed. It anticipates where the contaminant plume is likely to travel and what zones will be free of contaminants.

The NRL team responsible for the successful transfer initially met in 2010 to coordinate and intensify transfer strategies, responding to growing interest in the product outside the Navy laboratory. This effort included the CT-Analyst® inventors from NRL's Laboratory for Computational Physics and Fluid Dynamics, NRL's Technology Transfer Office, and NRL's Office of General Counsel. A partially exclusive patent license agreement was signed in 2013 with Safe Environment Engineering (SEE) of California. Under the SEE agreement, CT-Analyst® has been transferred to a number of first responder communities worldwide, including the city of Los Angeles and countrywide in Kuwait.

In addition, NRL executed two Cooperative Research and Development Agreements (CRADAs) with the University of Hamburg in 2010 and 2014. Most recently, another was executed in May 2016 with the University Graduate Center (UNIK) in Norway. The three CRADAs enabled operational demonstrations of CT-Analyst® in the cities of Hamburg and Oslo. To make the Navy technology available to a wider variety of consumers, NRL's Office of General Counsel has navigated export control issues and entered CT-Analyst® into multiple customized Work for Others Agreements. Onsite demonstrations have consistently substantiated the Navy-patented technology's utility in urban settings. Two examples are the demonstrations during preparations for the 2006 Super Bowl in Detroit and Washington's 2013 presidential inauguration, when the federal government's All-Hazards Center used CT-Analyst® to provide an initial assessment of airborne contaminant threats.

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EXCELLENCE IN TECHNOLOGY
TRANSFER AWARD

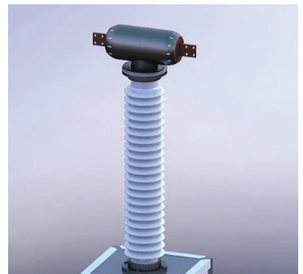
Fiber Optic Amplitude Modulated Sensors (FOS)

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

A suite of Navy-patented fiber optic amplitude modulated sensors (FOS), transferred to industry by the Naval Research Laboratory (NRL), is the up-and-coming game changer within the "Smart Grid" sector of the massive U.S. electric power industry. The innovative sensors accurately measure pressure, strain, temperature and other parameters capable of monitoring and controlling electrical power generation, distribution, and storage. This Navy technology also has proven its superiority in industrial control systems, and is the basis of highly sensitive fiber optic microphones that can detect unmanned aerial vehicles (UAVs) or help the acoustic design of buildings. Assembled in arrays, the high performance microphones also can diagnose function problems in rotating machinery, computer hard drives, aircraft engines, and other multi-movement components.

The NRL team was responsible for the FOS technology transfer via two patent licensing agreements (PLAs) with Fiber Optic Sensor Systems Technology Corp. (FOSSTEC) of Silver Spring, Maryland, in 2010 and 2013. Both parties recognized that more adaptability had to be built into the technology transfer agreement conditions to meet the ebb-and-flow funding issues typical of a startup company. They established an exceptionally open and flexible two-way communication that continues today. As a result, NRL helped amend licensing to incorporate the additional research areas that have yielded marketable company products in a much shorter timeframe than that required for the original PLA field restriction to energy grid applications.

FOSSTEC spun off its affiliated company, SmartSenseCom, Inc. (SSC) of Silver Spring, Maryland, specifically for the purpose of marketing two product lines (electric power and acoustics/vibration) based on the Navy-patented technology, each of which had several products available to customers. The NRL invention has led to relatively inexpensive, yet very precise, sensors that are ideal for applications requiring small size, very low frequency measurement, and/or the absence of electromagnetic noise. The sensors' LED light source provides long life and low power requirements. Other advantages include greater durability and secure transfer of data. The FOS have also performed well in a wide range of hostile environments during testing, showing little signal degradation under temperature fluctuations, water submersion, or chemical environments.



Electric Phenomena Sensor System for High Voltage Transmission

The use of the NRL patents licensed by FOSSTEC distinguishes all SSC products from other sensors on the market, proving simpler, cheaper, and more robust products while yielding very sensitive, consistent measurements. Driving the future market for FOSSTEC's products is the pressing need to upgrade our nation's infrastructure, along with the rise of computerized buildings, smart homes and appliances, and other consumer goods for which sensing will play an important role.

Left to right: Christopher Vizas, Dr. Nicholas Lagakos, Vasilios Lagakos, Cameron Childs

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SiloxoGrip™: A Siloxane-Based Non-Skid Coating

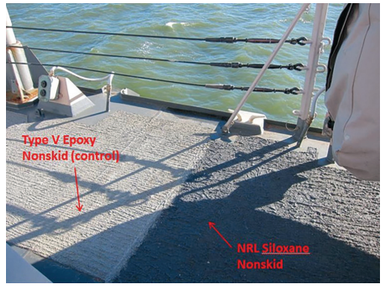
Department of Defense – U.S. Navy
U.S. Naval Research Laboratory

The U.S. Naval Research Laboratory (NRL) invented and transferred a coating to replace traditional epoxy resins with a siloxane-based material that marked a significant advancement in non-skid surface coating technology. The novel coating decreases environmental levels of volatile organic compounds, delivers greater durability, and improves direct adhesion to metals. Through a series of technology transfer efforts, NRL completed a non-exclusive patent license agreement with NCP Coatings, Inc. of Niles, Michigan. The new non-skid coating is commercially available under the company's brand name, SiloxoGrip™, and NCP Coatings has achieved sales in both defense and commercial markets.

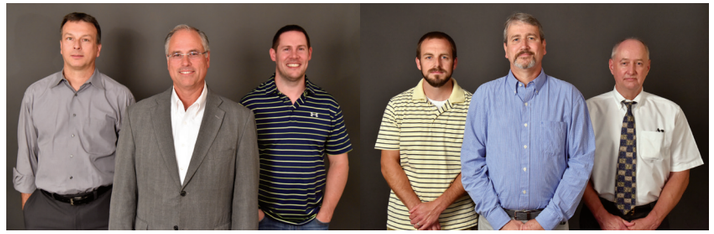
Both the NRL and NCP Coatings were collectively responsible for excellence in the technology transfer process. A series of efforts occurred in a relatively short period of time, beginning in 2011 when NRL's Technology Transfer Office established an "Agreement Between Owners of Invention Rights" with a third-party contractor that had inventorship rights in the technology. Under this agreement, the contractor took the lead in patent prosecution and licensing, and in 2012 engaged with NCP Coatings under a nonexclusive license agreement. However, the third-party contractor made the decision to discontinue its involvement in the technology and returned the invention rights to NRL in 2013.

NRL quickly negotiated termination of both the Invention Rights agreement and the existing license between the contractor and NCP. On January 30, 2014, the NRL signed a nonexclusive Navy patent license agreement with NCP Coatings to enable commercialization of the Navy's siloxane-based non-skid surface coating. NRL materials engineers worked closely with the licensee to ensure product compliance with MIL-SPEC requirements, achieving the NAVSEA Qualification confirmed in September 2015, and met a crucial milestone of the NRL/NCP license agreement. As a result of these dedicated efforts, the Navy can now purchase the non-skid coatings product that originated from its research.

The Navy applies approximately 3.7 million square feet of non-skid coatings each year at an annual cost of over $56 million. The new siloxane-based coatings are more durable (i.e., color retentive, wear- and chemical- resistant); thereby reducing costs through longer service life. The life expectancy of conventional epoxy coatings is 12 to 36 months, whereas the new non-skid coatings are expected to last 60 months or longer. The siloxane non-skid can be roll- or spray-applied due to its lower viscosity, whereas most epoxies are difficult to spray. The new coating is also dries to use within 24 hours, reducing the overall number of costly man-hours and downtime required. Increased service life allows ships to remain at sea longer before replacing deck coatings while in port. The reduction in consumption of both fuel and coating materials provides a favorable impact on the Navy's "Great Green Fleet" initiative for energy efficiency.



Side-by-side comparison of NRL's siloxane-based non-skid coating (right), versus the traditional aromatic epoxy-based non-skid coating (left) aboard USS Mason (DDG 87) after six months at sea. Notice that the aggressive surface profile and dark gray color remain in effect for the siloxane-based non-skid coating.



Left to right: James Martin, Steven Marquis, Dr. Erick Iezzi, Paul Slebodnick, John Wegand, James Tagert. Not pictured: Randy Terrill

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EXCELLENCE IN TECHNOLOGY
TRANSFER AWARD

Novel Corrosion Coating Process

Department of Energy
National Energy Technology Laboratory

Corrosion-related issues cost the U.S. economy an estimated $276 billion annually. Corrosion on metal items can cause safety hazards, loss of revenue, and environmental harm. Traditional corrosion-resistant coatings contain chromium and cadmium, which are expensive and environmentally harmful—and not the best solution for industry or end users.

To address this issue, the National Energy Technology Laboratory (NETL), in collaboration with Carnegie Mellon University (CMU), developed a revolutionary, cost-effective process for delivering superior corrosion protection to metal products. This novel "green" coating process electrodeposits aluminum on metal surfaces to provide corrosion protection aimed at displacing existing anti-corrosion coatings. The process represents a major advancement over current technology, delivering improved versatility and diminished environmental impact at a reduced cost.

Successful transfer of this novel corrosion coating process to the marketplace was made possible by the expertise and efforts of a team of inventors and technology transfer professionals. Jessica Sosenko, NETL Technology Transfer Manager, led efforts to ensure compliance of the NETL-sponsored research co-developed with CMU, and managed NETL's rights to the intellectual property. Sosenko, Leah Bower and Katie Klos actively worked with Drs. David Luebke and Hunaid Nulwala, inventors of the technology, to ensure that full rights to commercialize the technology were obtained.

There were several obstacles to successfully transferring the technology. Because it was in an early stage of development, the technology required additional testing in an operational environment to validate its potential for commercialization. Funding limitations meant that the team had to be creative in identifying, obtaining, and effectively utilizing resources from both local and national revenue streams.

Working from the inside out, the team first sought support from their home bases. At NETL, the AECOM site support contractor team identified and secured corporate funds to assist with technology maturation activities. Additional seed funds were secured from CMU. Creating a startup company to commercialize this technology was another hurdle. Dr. Luebke weighed the risk and ultimately decided to leave his long-term position at NETL to focus his time and attention on launching a new startup business.

Uncoated (left) and aluminum coated (right) screws after exposure to salt spray. Corrosion is clearly visible on the uncoated screw.

The end result proved to be worth the risk. LumiShield Technologies, Inc., was launched to deliver state-of-the art, environment-friendly, corrosion-resistant coatings for the biomedical, automotive, aerospace, infrastructure, marine, electronics and consumer products industries. The benefits derived from the adoption of LumiShield's coating technology include decreased manufacturing costs and improved component performance, and should position LumiShield to rapidly carve a niche in the $10-billion metal coatings market.

Left to right: Dr. Cindy Chepanoske, Dr. Dave Luebke, Dr. Hunaid Nulwala, Jessica Sosenko, Katie Klos, Leah Bower, Meghan Hayes

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Commercialization of ORNL's Piranha Text Mining Tool by VortexT Analytics, Inc.

Department of Energy
Oak Ridge National Laboratory

Piranha is a software suite developed by Oak Ridge National Laboratory (ORNL) that enables the cost-effective and efficient evaluation of large volumes of unstructured text-based data across many different formats. The software provides unparalleled processing speeds and is ideal for data mining applications when large amounts of text-based data must be analyzed quickly and effectively. Prior to their technology transfer effort, ORNL researchers used the technology in their work with the Federal Bureau of Investigation (FBI) to mine large amounts of text-based data in order to help the Bureau with specific cases.

Above: Piranha inventor Robert Patton (left) and Commercialization Manager David Sims (right) at the first annual Innovation Festival in 2015.

Personnel from ORNL and Pro2Serve at the Piranha text mining tool license agreement signing ceremony. Front, left to right: Dr. Barry Goss (Pro2Serve) and Dr. James Roberto. Back, left to right: David Sims, Dr. Chad Steed, Barbara Beckerman, Jim Treadwell, Dr. Tom Potok, Paul Martin (Pro2Serve).

This effort was highly unique for several reasons. ORNL authorized the inventors to participate directly in the commercialization of the technology, allowing them to form a joint venture with Pro2Serve—GSIA—and hold equity in the new company. The inventors helped GSIA personnel learn the software until they were up and running on their own. A second license enabled marketing the technology to non-government organizations and the formation of the small company, VortexT Analytics. This resulted in the addition of new licenses between ORNL and Pro2Serve.

The benefits of this effort are significant and have broad-reaching impact. Specifically, the technology transfer effort resulted in the continuation of data mining software and services to ORNL's original Piranha client, the FBI, by allowing GSIA to continue the work with the FBI when the agency's growing needs surpassed what ORNL could provide.

The transfer also resulted in the formation of a new U.S.-based small business (VortexT), spurring economic development through the creation of jobs and commercialization activity. Lastly, the transfer led to the establishment of a joint venture between VortexT and Covenant Health, with the potential to improve patient care and lower health care costs in the largest hospital system in East Tennessee (and potentially other health care systems in the future) by improving data analysis for patient electronic health records.

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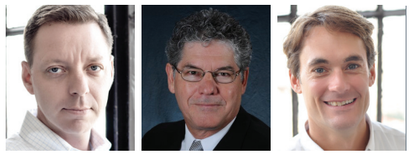
Miniature Ion Trap Analyzer License by 908 Devices, Inc.

Department of Energy
Oak Ridge National Laboratory

This technology transfer success of innovations developed at Oak Ridge National Laboratory (ORNL) is transforming how chemical analysis is conducted today. Using ORNL's technology, licensee 908 Devices, Inc. has taken mass spectrometry—the most widely accepted and broadly capable analytical technique used in explosives/chemical threat forensics, biotechnology research, food safety testing, and much more—and made it an elegantly simple, incredibly small, easy-to-use, and affordable tool. 908 Devices products based on the ORNL technology have demonstrated important public safety benefits in law enforcement and hazardous materials detection. Product sales are reaching revenue targets, multiple rounds of venture capital funding have totaled more than $28 million, and job growth has exceeded 70 employees in Massachusetts and North Carolina.

The success can be attributed to the excellence and creativity of individuals at both 908 Devices and ORNL. Upon learning of ORNL researchers' developments, the ORNL Technology Transfer Division undertook significant efforts to protect the intellectual property and market it to industry. When approached by a former ORNL researcher turned successful entrepreneur who was intimately familiar with the technology, ORNL proposed an Option agreement based on the Department of Energy's America's Next Top Innovator Program. For a $1,000 fee, the Option agreement provided a 6-month window for commercialization to be considered. 908 Devices was formed, an exclusive field-of-use license was signed, and commercialization was underway within the next 6 months.



Left to right: Dr. Christopher Brown, Dr. Michael Ramsey, Dr. Kevin Knopp. Not pictured: Jud Hightower

Thanks to the innovation and creativity of 908 Devices, ORNL's scientific discoveries were transformed into a commercial product. These exceptional activities included successfully securing multiple rounds of venture capital funding, conducting rigorous engineering to contain ORNL's technology in a robust package, marketing at key industry conferences, and forming crucial strategic alliances.

Products that include ORNL technology are being used by a range of 908 Devices customers in more than 18 countries. Major U.S. customers include the Massachusetts Hazardous Materials Emergency Response Division, the U.S. Department of Defense, the New York City Fire Department, and the Hazardous Materials Committee of the Washington, D.C. metro area. Furthermore, 908 Devices is now working with the U.S. Army's Next Generation Chemical Detector program to develop next-generation devices to detect and identify chemical warfare agents, toxic industrial chemicals, and other hazards.

Thanks to this excellent technology transfer effort, a company that previously did not exist is now selling products that are keeping people safe—while employing more than 70 people and generating revenue for the regional economies of its Boston and North Carolina locations.

The heart of the 908 Devices product line is composed of ORNL-developed ion trap mass analyzers that are a thousand times smaller than those in conventional mass spectrometers. These diminutive traps can operate much closer to atmospheric pressures and enable the use of dramatically smaller pumps, ionizers, detectors, and electronics than in laboratory or transportable mass spectrometers. (Photo courtesy of 908 Devices)

Standing, left to right: Dr. Jennifer Caldwell, Dr. Edna Gergel. Seated: Dr. William Whitten

Contact: Dr. Mark Reeves, (865) 576-2577, reevesme@ornl.gov

SCIEX License of ORNL's Open Port Sampling Interfaces for Mass Spectrometry

Department of Energy
Oak Ridge National Laboratory

Licensing ceremony to commemorate the signing of the license agreement between UT-Battelle and Danaher Corporation. (Photo courtesy of Oak Ridge National Laboratory) Seated, left to right: Dr. Gavin Fischer, Dr. James B. Roberto. Standing, left to right: Dr. Chris Lock, Dr. Gary Van Berkel, Dr. Vilmos Kertesz, Dr. Jennifer Caldwell, Dr. Edna Gergel, and Dr. Michelle Buchanan.

Standing, back row, left to right: Dr. Jennifer Caldwell, Marc Filigenzi, Dr. Edna Gergel. Seated, left to right: Dr. Vilmos Kertesz, Dr. Gary Van Berkel

Left: Tom Covey, SCIEX
Not pictured: Kevin Smith, SCIEX

This technology transfer success from Oak Ridge National Laboratory (ORNL) involves an exciting innovation that dramatically simplifies mass spectrometry, enabling its wider use. Mass spectrometry is used in chemical analysis, mainly by trained researchers in sophisticated laboratory settings. With high-selectivity and high-sensitivity capabilities, mass spectrometry is used to differentiate millions of chemicals in quantities as low as 1 part per billion.

ORNL's innovation enables mass spectrometry to be performed by novice users in settings outside high-tech labs. This has significant implications for a range of applications where the use of mass spectrometry would be beneficial, but until now was not feasible. These application areas include onsite security and forensics investigations, process control, food and water safety, disease diagnosis in hospitals and clinics, and more.

The technical challenge that ORNL researchers targeted was the complex process of transporting the sample into the mass spectrometer—a bottleneck that had been blocking expansion of mass spectrometry to more general use and wider application. ORNL researchers developed an open port sampling interface (OPSI). When the user simply touches the sample to the end of the OPSI probe, which is connected to a mass spectrometer, a screen almost instantaneously displays the chemical's identity and approximate concentration. The straightforward, inexpensive OPSI technology is easy to integrate into existing mass spectrometers.

Recognizing the significant commercial potential of this technology, ORNL's longtime collaborative partner, SCIEX, licensed it in January 2016. The company is now transforming ORNL's fundamental research into a product that will eventually eliminate the need for liquid chromatography sample preparation. In addition, SCIEX is establishing a comprehensive product development program, leveraging the many relevant business units within its parent company, Danaher Corporation.

This technology transfer effort illustrates how a forward-thinking lab and an agile yet powerful company leveraged their long-term commitment to R&D collaboration focused on achieving the goals of both the Department of Energy and the mass spectrometry industry. The result was a technology that met a crucial market need and is now on the path to new products that facilitate the ease and accessibility of mass spectrometry with user-friendly, rapid sampling systems.

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Superhydrophobic Transparent Glass Thin Film Innovation License to Samsung

Department of Energy
Oak Ridge National Laboratory

Oak Ridge National Laboratory (ORNL) has developed a superhydrophobic transparent glass (STG) thin film innovation. The coating provides glass displays that are extremely water-repellant, durable, and fingerprint-proof for products including smart phones and tablets, solar panels, optical components, windows, and other uses. Unlike more fragile polymeric and powder-based options, the coating exhibits superior resistance to abrasion, and is thermally stable to 500 degrees Celsius. The innovation is applicable to current commercial high-volume manufacturing methods and uses nontoxic, naturally abundant, and inexpensive precursor materials.

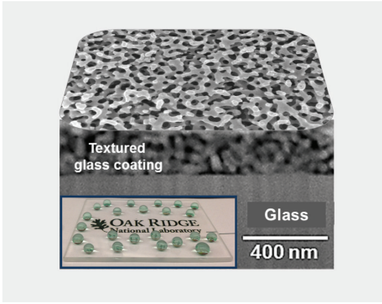
Samsung, a Fortune 50 company and global leader in electronics and appliances, licensed ORNL's technology in August 2016 and is actively pursuing its implementation.

ORNL Senior Commercialization Manager Eugene Cochran, Ph.D., MBA, spearheaded the complex effort that led to an exclusive licensing agreement with Samsung. He led negotiations with Samsung, drove deadlines, headed the effort to gain DOE approval, and pushed negotiations to closure. The consumer electronics giant plans to use the ORNL innovation in current and future product lines, including smart phones, tablets, and appliance displays. The agreement immediately became one of the largest technology transfers in terms of royalty revenue in ORNL's history, and does much to help the lab meet its mission to share its innovations for the public good.

The five-patent exclusive licensing agreement allows Samsung to use the clear STG technology to improve performance in its glass displays. Consumers will benefit from more resilient smart phones, tablets, and appliances that offer more brilliant displays and are less prone to fingerprints and smudges. As testament to the technology's potential impact, ORNL's technology won a 2015 R&D 100 Award.

The transfer of ORNL's STG thin film technology will also help the American economy because Samsung will provide funding for further research in the United States. The success also achieves early technology adoption on a large scale within a narrow field of use, paving the way for licensing to future partners in even larger markets. The announcement of the agreement has also generated much interest from other companies to license the innovation in other fields of use.

ORNL's Dr. Tolga Aytug uses thermal processing and etching capabilities to produce a transparent superhydrophobic coating technology licensed by Samsung to improve the performance of glass displays on electronic devices. (ORNL image)



ORNL's superhydrophobic transparent glass thin film coating technology showing three-dimensional construction of the cross-sectional and planar morphology of a glass coating. The interconnected porous nanoscale branched network is revealed. Inset: An example of borosilicate substrate coated with nanostructured invisible glass film, displaying the superhydrophobic and transparent nature of the product (blue-dyed water droplets bead up on the surface). (ORNL image)

Left to right: Dr. Tolga Aytug, Dr. Eugene Cochran, Dr. John Simpson, Marc Filigenzi

Dr. Debasis Bera, Samsung
Not pictured: Dr. Yoon Goo Lee, Samsung

Contact: Dr. Eugene Cochran, (865) 576-2830, cochraner@ornl.gov

Physical and Cyber Risk Analysis Tool (PACRAT)

Department of Energy
Pacific Northwest National Laboratory

Pacific Northwest
NATIONAL LABORATORY

RhinoCorps Simajin PACRAT integration team, from left to right: Rob Roy, Ian Broglie, Dan McCorquodale, Chad Hanawalt

The Physical and Cyber Risk Analysis Tool (PACRAT), developed by Pacific Northwest National Laboratory (PNNL), is a first-of-its-kind software that identifies vulnerabilities in critical facilities and infrastructures by blending cyber and physical security. This provides a change from existing cyber and physical vulnerability assessments that are performed independently and do not account for the interdependence of the security apparatus. PACRAT performs holistic vulnerability analyses and recommends prioritized cyber and physical security upgrades to reduce risk and optimize investments. Not only does it significantly reduce analysis time, but the results are driven by a defensible algorithm and modeling software, instilling confidence in security investment decisions.

PNNL scientists marketed PACRAT to potential licensees through the U.S. Department of Homeland Security's Transition to Practice (TTP) program, and built a relationship with RhinoCorps, Ltd. Co., that led to a license in March 2016. RhinoCorps saw the patented technology's potential to enable the company to enter new markets via an expanded and first-of-a-kind product offering, shared proprietary information to facilitate transition, and incorporated the tool into its existing Vanguard suite and Simajin platform for use by infrastructure owners in government and industry.

Although RhinoCorps saw the value early on, the small business had to ensure a viable path to commercialization. Confident of PACRAT's capability and value, PNNL submitted the technology to the TTP program and presented to industry and government representatives. The positive response and requests for follow-on discussions confirmed the potential market space for RhinoCorps. Throughout the research, development and marketing process, the two companies built a true collaboration of mutual trust. They shared the scientific underpinnings of their work and cross-trained staff on each other's software. RhinoCorps even provided PNNL with its proprietary software. The integrated product is expected to be available by June 2017.

PACRAT fills a gaping hole in security assessments that leave organizations in all sectors, including nuclear, energy, water, security and banking, exposed to attacks that combine physical and cyber aspects. Once integrated with market leader Simajin, PACRAT will provide government agencies and commercial entities the information they need to make appropriate security investment decisions to better protect vulnerable critical infrastructures nation- and worldwide from adversarial attacks.

Left to right: Samuel Clements, Anthony Contri, Dr. Kannan Krishnaswami, Dr. William Hutton, Douglas MacDonald, Casey Perkins

Contact: Rosemarie Truman, (509) 371-6017, rosemarie.truman@pnnl.gov

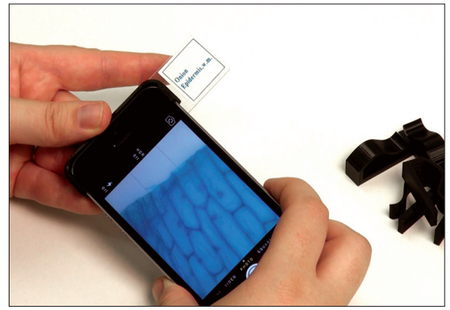
Smartphone Microscope

Department of Energy
Pacific Northwest National Laboratory

Pacific Northwest
NATIONAL LABORATORY

The smartphone microscope is a sleek, simple, and inexpensive way to turn a smartphone into a cost-effective, portable, and powerful microscope. The inexpensive and mobile device, developed at Pacific Northwest National Laboratory (PNNL), allows anyone with a smartphone to effortlessly explore the world's tiniest and most fascinating objects, ranging from bacteria to grains of sand. Its streamlined design easily slips over the vast majority of smartphones. The microscope's lightweight housing can be 3D printed at home or with a commercial injection mold machine. The device's lens is an inexpensive glass bead that's often used in reflective pavement markings. It's also easy to use: The microscope slides over a smartphone camera, an object is held up against the microscope, and the magnified object is displayed on the phone screen. Users—ranging from first responders, scientists, health workers and science educators—take pictures and share the images via email, text message, or social media. Being able to quickly share images speeds up collaboration and problem solving, including identifying a suspicious powder or a disease-causing pathogen. All of these benefits are remarkably affordable as the microscope costs as little as 5 cents.

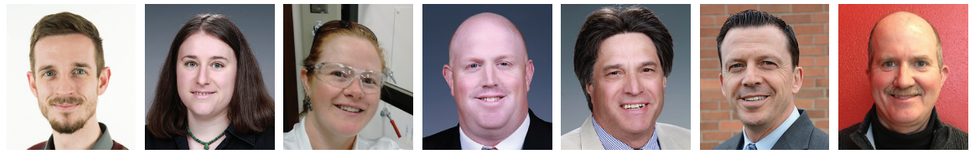
PNNL researchers initially developed the smartphone microscope to reduce the time needed to identify suspicious powders, but it soon became obvious the device had greater utility. As a result, the development team worked with its commercialization staff to determine the quickest, most-effective way to allow public access to the technology.



The Smartphone Microscope attached to a cell phone shows the epidermis of an onion magnified at 350 times.

To get the smartphone microscope into the hands of those who needed it as quickly as possible, PNNL decided against the traditional and sometimes time-consuming commercialization path of patenting and licensing its intellectual property. Instead, PNNL staff translated their device's design specifications into an easy-to-use file format they posted online in 2015, where it is widely accessible and has been downloaded more than 420 times, enabling anyone with a 3D printer to make it themselves. PNNL also partnered with Plastic Injection Molding to sell pre-made copies of the device.

The strategic and unique decision to not patent or license PNNL's smartphone microscope cut out months and even years from the technology transfer process, enabling the public to access this valuable tool much sooner. The breadth and depth of the device's impact has been substantially expanded as a result.



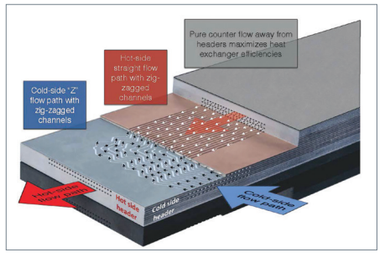
Left to right: Josef Christ, Rebecca Erikson, Dr. Janine Hutchison, Derek Maughan, Dr. Gary Spanner, Ron Thomas, Ken Williams
Not pictured: Cameron Hoheimer

Contact: Rosemarie Truman, (509) 371-6017, rosemarie.truman@pnnl.gov

The Selection, Evaluation and Rating of Compact Heat Exchangers (SEARCH) Software Suite

Department of Energy
Sandia National Laboratories

Heat exchanger technology is critical in a variety of applications, including power generation and applied energy solutions (solar, biomass, fossil, nuclear, geothermal, etc.), refrigeration, chemical production, and oil and gas processing. Micro-channel heat exchangers (MCHEs) provide higher performance, more compact size, and enhanced reliability at lower production costs. MCHEs are critical components for leveraging advanced technologies such as the supercritical carbon dioxide (sCO2) Brayton cycle. These cycles can increase the efficiency of conventional steam-based fossil, solar, and nuclear power plants from approximately 33% to more than 45%.



A diffusion bonded microchannel heat exchanger core section cross-sectioned to expose both straight and zig-zagged channels.

Designing optimal compact heat exchangers is slow and difficult. To simplify this process, Sandia National Laboratories developed an efficient, flexible, and comprehensive software design tool: Selection, Evaluation, and Rating of Compact Heat Exchangers (SEARCH).

Ensuring that there was a reliable supply of MCHEs was an essential step toward moving the sCO2 Brayton technology to market. Manufacturing capability for industrial MCHEs has lagged behind demand, especially in the U.S. Vacuum Process Engineering, Inc. (VPE), a small American business, was selected as the domestic manufacturing partner that would bring Sandia's MCHE technology to market. Sandia and VPE entered into an umbrella Cooperative Research and Development Agreement, and Sandia also licensed its SEARCH software suite, which enables the design of efficient MCHEs, to VPE.

At Sandia, Yasmin Dennig, a senior technical business development specialist, suggested separating the complex Brayton cycle technology into its component parts and using a Federal Business Opportunities announcement to find a manufacturing partner. Matt Carlson, the subject-matter expert on heat exchangers on Sandia's sCO2 Brayton cycle team, created the SEARCH software, and continues to direct and support technical maturation of the software. Both Carlson and Dennig have been working with VPE to identify where demand for customized MCHEs currently exists. Dan Sanchez, technology partnerships manager at the Department of Energy (DOE), provided key technical advice and expedited the due diligence of the CRADA to meet schedule requirements and an important deadline. Carl Schalansky, president of VPE, thoroughly demonstrated his company's qualifications and eagerness to partner with the labs. Christy Bell, VPE design engineer, worked closely with Carlson to enhance the SEARCH software to meet customer needs.

By partnering with Sandia, VPE became the first American Society of Mechanical Engineers (ASME)-certified MCHE manufacturer in the U.S. This certification has directly led to a decrease in MCHE prices by over 50%, increased availability to customers, and an increase in manufacturing orders at VPE. VPE is now selling single-core MCHEs to customers worldwide. The partnership has expanded into a larger program co-sponsored by DOE, allowing Sandia to continue working with VPE to make improvements and scale up to larger, multicore MCHEs.

Left to right: Christy Bell, Matt Carlson, Yasmin Dennig, Dan Sanchez, Carl Schalansky

Contact: Jackie Kerby-Moore, (505) 845-8107, jskerby@sandia.gov

Zika Virus Specimens for Research & Development and Diagnostic Technologies

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

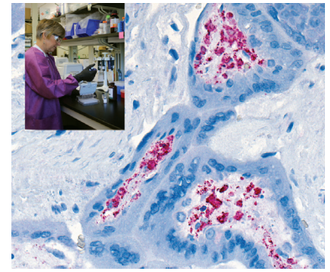
The Centers for Disease Control and Prevention (CDC) has transferred Zika virus specimens and CDC-developed diagnostics since CDC became involved to support the public health response for the Zika virus outbreak in February 2016. Such efforts continue today.

To date, CDC has shipped relevant Zika specimens over 9 months to 18 countries and 33 U.S. states and territories, and continues to conduct transfers. The different strains/isolates of the Zika virus are essential to further Zika research, increase knowledge about the virus, and support vaccine and diagnostic test development.

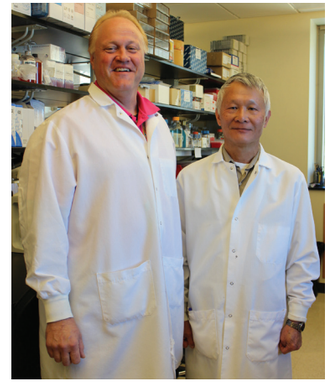
CDC was the first organization to develop and receive the Food and Drug Administration's (FDA) Emergency Use Authorizations (EUAs) for the Zika MAC-ELISA and Trioplex rRT-PCR assays, two gold-standard Zika virus diagnostic tests. These diagnostic assays were, at first, the only tools for clinical testing of people exposed to Zika virus, symptomatic or not. The tests are still in use. The first Zika MAC-ELISA was approved by the FDA on February 26, 2016. CDC developed a second Zika MAC-ELISA version using virus-like particle (VLP) technology, and received EUA approval on June 29, 2016. CDC has also developed a method (Trioplex reverse real-time-polymerase chain reaction) to detect Zika, dengue, and chikungunya virus in samples. CDC has shared these technologies, at no cost to partners, to improve the detection of Zika virus.

CDC scientists and staff have worked tirelessly to facilitate research and development of Zika, design and commercialize related diagnostic assays, and protect America's health and quality of life. CDC is using both patented and non-patented technologies to support the Zika response. Working rapidly to develop an unprecedented Zika detection test in the Zika MAC-ELISA assay, CDC has distributed it to more than 60 public health laboratories and added commercial partners. CDC has executed licenses with four major reference laboratories for the Zika MAC-ELISA assay for diagnostic development and clinical testing for Zika infections in patients. CDC is working to license the Zika MAC-ELISA assay with new VLP technology to a company for mass production/diagnostic development and commercialization.

These technologies provide both an important backdrop for Zika research and breakthrough inventions to diagnose Zika infections. The public health importance of this development is that the Zika virus infection during pregnancy can result in serious birth defects. Additionally, some people infected with Zika may experience Guillain-Barré syndrome. Interest in this technology has yielded additional private sector work and resources directed at this problem. Finally, this successful technology transfer to the private sector has enabled the scale-up for mass production of Zika diagnostic tests and contributed to further Zika research and development.



Inset: A CDC microbiologist prepares for the development of the Zika MAC-ELISA test. The Trioplex assay was developed by CDC for the Zika response. The Zika MAC-ELISA was developed prior to the response. (CDC photo, Sue Partridge and Sherif Zaki.)



Left to right: Brent Davis, Dr. Jeff Chang

Left to right: Lisa Blake-DiSpigna, Kevin Brand, Dr. Barbara Johnson, Naureen Iqbal, Suzanne Seavello Shope

Contact: Suzanne Shope, (404) 639-1446, awd8@cdc.gov

Ebola Vaccine Development from Basic Research to the Clinic: Partnering for Public Health

Department of Health and Human Services
National Institute of Allergy and Infectious Diseases

Researchers at the Vaccine Research Center (VRC) of the National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH), have been developing and testing Ebolavirus vaccine candidates for over 15 years. Beginning in 2008, the VRC's Dr. Nancy Sullivan worked with Dr. Alfredo Nicosia at Okairos, a Switzerland-based biotechnology company, under a Research Collaboration Agreement to develop novel vaccine candidates. This collaboration brought together Dr. Sullivan's expertise in Ebolavirus protein antigen design and Okairos scientists' experience with the Okairos proprietary chimpanzee adenovirus vectors.

As a result of this collaboration, in 2010 VRC and Okairos developed Ebolavirus vaccine candidates that use chimpanzee adenoviruses to deliver isolated, modified Ebolavirus proteins to the subject being vaccinated. The subject's immune system recognizes the Ebolavirus proteins, which are non-infectious, as a foreign material and mounts an immune response to them. Part of this immune response creates a "memory" of the Ebolavirus protein so the immune system can efficiently eliminate such proteins if they are found in the body in the future. The VRC continued development of these Ebolavirus vaccine candidates and planned to test their safety and efficacy in Phase I clinical trials in early 2015.

As the 2014 Ebolavirus disease outbreak in western Africa grew into a global health crisis, academic scientists, small biotechnology firms and pharmaceutical companies redirected resources toward developing vaccines and therapeutics to combat the deadly virus.

In late summer 2014, VRC accelerated its plans for these Ebolavirus vaccine clinical trials and joined efforts with GlaxoSmithKline (GSK), which had acquired Okairos in 2013 and the rights to the chimpanzee viral vectors, to make additional vaccine materials for more clinical trials.

This cooperative effort among NIAID; its contractor, Leidos Biomedical; and GSK to hasten efforts toward a safe and effective Ebolavirus vaccine during a public health crisis is an exemplary case of successful federal technology transfer. The public-private partnership began with a collaborative research project and culminated, seven years later, in clinical trials of the resulting Ebolavirus vaccine. These trials began in September 2014, and GSK continues to develop the vaccine candidates under a license agreement with NIAID in order to prepare for future outbreaks of Ebolavirus disease.

Left to right: Dr. Vincent Feliccia, Dr. Amy Petrik, Dr. Carol Salata. Below: Dr. Nancy Sullivan, Dr. Rosemary Walsh Not pictured: Dr. Claudia Haywood, Judith Stein, Dr. Cristina Thalhammer Reyero

Contact: Dr. Nancy Sullivan, (301) 435-7853, nsullivan@nih.gov

EXCELLENCE IN TECHNOLOGY
TRANSFER AWARD

Expanding the Skies for UAVs via Transfer of NASA Armstrong Flight Research Center's Sense-and-Avoid System

National Aeronautics and Space Administration
NASA Armstrong Flight Research Center

The licensing of NASA Armstrong Flight Research Center's (AFRC) Sense-and-Avoid System with ADS-B Avionics by Vigilant Aerospace Systems represents a major step forward in bringing unmanned aerial systems (UAS) into the National Airspace System (NAS). The technology is a combination of hardware and software that provides crucial capabilities previously nonexistent for UAS. These capabilities include a unique collision-avoidance algorithm that keeps the aircraft on a "well-clear" path and cutting-edge communications that broadcast and receive aircraft situational information. These features, combined with a sophisticated display, dramatically increase safety for the UAS itself, other aircraft in the surrounding airspace, and persons and property on the ground.

AFRC engineers worked diligently to prepare the technology for commercialization. Then, thanks to the work of the AFRC Technology Transfer Office (TTO) via several mechanisms, this transformative innovation for UAS was licensed by Oklahoma-based startup Vigilant Aerospace Systems. The TTO developed effective collateral that enabled marketing to begin while intellectual property protection was still being secured. In addition, the technology's selection as the winner of an FLC Far West Region award was also parlayed into a marketing opportunity with Vigilant Airspace.

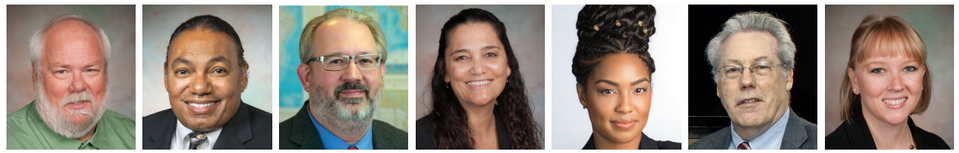
Vigilant Aerospace was formed specifically to commercialize AFRC's technology through funding from Cimarron Capital Partners, which learned of the technology at the FLC Far West Region's awards ceremony. Once the license was executed, Vigilant Aerospace pursued commercialization through focused product development, integrating AFRC's technology into its FlightHorizon™ avionics platform.

The company is now developing partnerships with numerous commercial UAS operations companies and is in talks to deploy the technology with companies that manage major U.S. infrastructure. This commercialization success is yielding safer air traffic control, helping to ensure approval of UAS in the NAS; UAS expansion into new scientific, government, commercial, and civilian applications that benefit the public; and economic growth as Vigilant Aerospace adds jobs to its payroll as new markets develop.

This technology transfer success aligns with NASA's mission to benefit aviation, which will be transformed as this autonomous UAS system provides improvements in safety, efficiency, and flexibility of operations, thereby increasing the capacity, robustness, and flexibility of the NAS.

A small UAS equipped with a transponder is prepared for use in flight testing of NASA AFRC's Sense-and-Avoid System with ADS-B Avionics with smaller aircraft. (NASA photo)

NASA AFRC's Sense-and-Avoid System with ADS-B Avionics can be used on a portable tablet computer, such as the one shown here, with an ADS-B receiver attached. (Vigilant Aerospace photo)



Left to right: Earl Adams, Ricardo Arteaga, Kraetti Epperson, Laura Fobel, Janeya Griffin, Robert Heard, Samantha Hull

Contact: Laura Fobel, (661) 276-3967, laura.j.fobel@nasa.gov

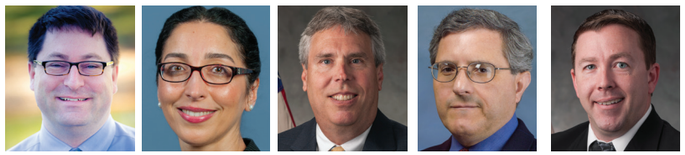
The Commercialization of an Innovative Hydrogen Leak Detection Tape

National Aeronautics and Space Administration
NASA Kennedy Space Center

Hydrogen gas leaks pose many significant safety and costly maintenance problems. Finding the exact location of hydrogen gas leaks in an industrial setting is so difficult that it can cost millions of dollars in resources and labor. Chemochromic pigments can be very robust hydrogen leak indicators due to their high visibility, long-term stability, and reliable chemical reactions between the pigments and hydrogen. However, their implementation is often difficult because of environmental interference and the gas permeability of host materials.

Intellipigment development team - back row, left to right: Janine Captain, Luke Roberson, Bobby DeVor, Gary Bockerman, Bob Youngquist, and Karen Thompson. Front row, left to right: Nahid Mohajeri, Nazim Muradov, Ali Raissi, Martha Williams and Trent Smith

To address this problem, NASA Kennedy Space Center (NASA KSC) scientists collaborated with University of Central Florida (UCF) researchers at the Florida Solar Energy Center (FSEC) to invent hydrogen leak sensors, utilizing a combination of chemochromic pigments and polymers. The sensor quickly changes color from beige to black when exposed to hydrogen gas. The sensor is extremely versatile and can be incorporated into a wide variety of commercial products through molding into rigid or flexible shapes, such as tape or fiber spinning into protective safety garments. This sensor was proven to be very effective for pinpointing the exact location of leaks in hydrogen gas lines and fittings at launch pads, industrial facilities, and academic research uses. The inventors won the prestigious R&D 100 Award in November 2014 and the 2015 TechConnect Innovation award.



Left to right: John Miner, Dr. Nahid Mohajeri, James Nichols, Dr. Ali Raissi, Dr. Luke Roberson

The NASA KSC Technology Transfer Office executed both a patent license agreement (with a sublicense clause) and a Space Act Agreement with UCF to accomplish the technology transfer. UCF combined its patents with NASA KSC's and marketed them as one intellectual property portfolio. NASA KSC assisted with marketing and lead generation, as well as technical support. One of the UCF researchers and co-inventor of the technology founded a startup company called HySense Technology, LLC, with assistance from UCF's business support services. HySense licensed the technologies from UCF, fully developed and marketed its product (known as Intellipigment™), and had five commercial customers. The company won a $100,000 first-place award at an innovation competition at the Innovation Concourse of the Southeast: Safety & Manufacturing event in Orlando, Florida.

In 2016 HySense was acquired by Nitto, Inc., a subsidiary of Nitto Denko Corporation. Nitto is marketing the technology as HySense™ hydrogen detection tape. Nitto has grown to be a leader in the energy materials, industrial tapes, environmental solutions, optronics, and life sciences markets. Commercial production and sales of the technology by Nitto will make this leak sensor widely available for use by NASA, the Department of Defense, and industries that utilize hydrogen gas. Due to the success of all involved in this technology transfer effort, in 2016 the tape was named the prestigious NASA Commercial Invention of the Year.

Contact: James Nichols, (321) 867-6384, james.d.nichols@nasa.gov

INDIVIDUAL AND TEAM AWARDS

FLC NATIONAL AWARDS

Scenario Planning and Effects Control System (SPECS)

Department of Defense - U.S. Navy

Naval Air Warfare Center Training Systems Division

Federal Law Enforcement Training Center

Warfighters and law enforcement personnel alike are now more effective in the field thanks to the outstanding partnership between the Naval Air Warfare Center Training Systems Division (NAWCTSD) and the Federal Law Enforcement Training Center (FLETC). The long-term collaboration between these agencies has created an extraordinary track record of success, culminating most recently in NAWCTSD's Scenario Planning and Effects Control System (SPECS). This extensible technology suite puts the sights, sounds and smells of conflict in the hands of training instructors, allowing them to create highly immersive environments. The more exposure law enforcement and military personnel have to such realistic stressors, the better able they are to quickly make effective decisions on the battlefield or on the streets.

Immediate and delayed after-action review and remediation of team and individual performances.

State-of-the-art immersive training for force protection and law enforcement personnel.

SPECS was developed through a series of Interagency Agreements beginning in 2009 and continuing today. Several iterations have advanced the software to make it a uniquely powerful technology. For example, its unique sound system allows instructors to select sound effects from multiple sound libraries and, with just a right-click of the mouse over a two-dimensional map, prompt the system to automatically mix sounds and select the correct speakers and amplitudes needed for the scenario. Smell generation is just as easy and precise, as is after-action review. Because most, if not all, of law enforcement training scenarios are instructor-led, SPECS was designed to support instructors as operators, as well as to be accessible by a range of instructors with a range of skills. Its combination of government and off-the-shelf components make it both cost-effective and sustainable, while its scalability adapts to law enforcement training facilities of one or two rooms to military tactical training areas spread across miles.

SPECS is now operational within numerous immersive and mixed-reality training environments, including FLETC's Performance Assessment Laboratory, the FLETC Intermodal Training Facility in Glynco, Georgia; the state of Pennsylvania's Northeast Counter Drug Training Center (NCTC); and several U.S. Navy and U.S. Marine Corps facilities. Since 2013, more than 100,000 law enforcement personnel and tens of thousands of warfighters have participated in the immersive training. In addition, SPECS is a component of the U.S. Army Live Training Transformation architecture, expanding its availability exponentially.

The NAWCTSD and FLETC teams driving SPECS bring a wealth of experience and expertise to bear in the advancement of this innovative training program. They have deep resources to draw on—from NAWCTSD's long history of developing and transferring state-of-the-art simulation technology to FLETC's expertise in the influence of special effects on performance. Building on SPECS and their other successes, this outstanding collective effort will continue to break new ground long into the future.

Winners from DHS Federal Law Enforcement Training Center: Elwyn Collins, Vance Fowler, Barbara Hernandez, Dr. William Norris, Dr. Terry Wollert

Winners from Naval Air Warfare Center Training Systems Division: Matthew Adams, Paul Barber, Ryan Faircloth, Tyson Griffin, Richard Hebb, Matthew Lankford, Courtney McNamara, Rocco Portoghese

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Captain Jeffrey T. Elder

Department of Defense

Naval Surface Warfare Center Crane Division

Captain Jeffrey T. Elder assumed command of Naval Surface Warfare Center Crane Division (NSWC Crane) in June 2014. Since assuming command, he has worked closely with the Office of Research and Technology Applications (ORTA) to expand upon the work of his predecessors by further institutionalizing technology transfer (T2) and making it a strategic tool at the lab. As a result, T2 has been elevated to unprecedented levels in terms of the size and quality of the lab's intellectual property (IP) portfolio, numbers of signed T2 agreements, and strategic partnerships with state organizations, universities, and industry. The T2 staff and their partners have received four awards in recognition of their achievements within the last two years. Captain Elder's leadership alone qualifies him for this award; however, what makes him exceptionally worthy is that these remarkable T2 successes occurred while the lab experienced a drastic reduction in the overhead budget from which the NSWC Crane T2 and patent programs are funded.

Captain Elder's experience includes time served as a Secretary of Defense Corporate Fellow, when he spent one year at a host Department of Defense (DOD) industry partner, learning corporate best business practices relevant to the DOD. His interactions with industry partners have contributed to his understanding of how NSWC Crane and private industry can mutually benefit one another through T2. He has promoted Crane's ORTA both internally and externally, and serves as a visible champion of the T2 program. Within the lab, he has encouraged scientists and managers to participate in T2, most particularly by reestablishing the IP incentive program and the inventor appreciation event. He has boosted the NSWC Crane T2 program office to even greater achievement as the lab pushes toward fulfilling its strategic—and ambitious—Grand Challenge of 1,000 pieces of intellectual property by 2020. To help achieve this goal, he promotes T2 whenever he speaks with an actual or potential industry partner and ensures that the organizations understand the benefits of Cooperative Research and Development Agreements (CRADAs), patents, and patent licensing agreements (PLAs). Under Captain Elder's leadership, the IP portfolio has increased by over 40 percent and the number of CRADAs and PLAs reached record numbers.

Other areas where Captain Elder has successfully promoted the benefits of partnering with NSWC Crane are industry interchange meetings and facility visits by prospective partners in industry, education, or state and local governments. Industry exchange meetings coordinated by Captain Elder provide opportunities for Crane and industry experts to identify common technical areas of interest where the Crane scientists could provide assistance. Captain Elder has not only continued, but has elevated and expanded the efforts begun by his predecessors to work with the ORTA and transform Crane's T2 function into one of the lab's showcase areas of achievement.

Captain Jeffrey T. Elder, (812) 854-1210, jeffrey.elder@navy.mil

Dorothy Vincent

Department of Defense
Office of Naval Research

For more than a quarter of a century, Dorothy "Dottie" Vincent has exhibited the innovation, creativity, and leadership of an outstanding technology transfer professional. Beginning as a front-line laboratory employee, she has diligently worked her way up the ladder to become the leader of the Navy's technology transfer enterprise. Highlights of her career include laying the foundation for the technology transfer functions at one of the Navy's premier laboratories, collaborating on the establishment of key tech transfer policies and processes for the Navy, leading creative best-practice efforts, and inspiring innovation from those around her.

A tireless evangelist for technology transfer since becoming the Technology Transfer Program Manager for the Department of the Navy in 2006, Vincent's outreach within the extensive Navy enterprise has led to the startup of new tech transfer operations at more than a dozen facilities. She now leads a vibrant tech transfer community of 38 Offices of Research and Technology Applications (ORTAs) in 44 designated labs located on 4 continents. In addition to extensive efforts to build a cohesive and communicative Navy technology transfer community, Vincent constantly fosters a culture of innovation that began with the establishment of a technology transfer improvement pilot program specifically enacted to develop new best practices.

Vincent's superlative career of service to technology transfer is encapsulated in the story of one of those innovative pilot projects—the improvement and widespread transfer of the Innovation Discovery Process (IDP). The IDP was a facilitated brainstorming process developed to address low invention disclosure rates at one Navy lab. However, Vincent saw far greater potential. As a result of her creativity and innovation, IDP has grown into an exciting new tool with proven capabilities to drive new invention disclosures and patent applications, improve licensing outcomes, enhance the visibility and reputation of technology transfer within a lab, and develop strong relationships with public- and private-sector partners.

The technology transfer mechanisms involved in the IDP story include the employment of internal innovation programs, a Partnership Intermediary Agreement (PIA), and old-fashioned networking. Vincent's transfer efforts have resulted in at least 14 Navy labs, 7 Air Force labs, and the Department of Energy's Princeton Particle Physics Lab hosting IDP events. The transfer effort is ongoing, with more than a dozen events currently in development. The Innovation Discovery Process represents the best of Dottie Vincent's vision and leadership, and will stand as a lasting monument to her outstanding legacy as a technology transfer professional.

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Elizabeth Brooke Pyne

Department of Defense
Naval Surface Warfare Center Crane Division

In November 2014, Brooke Pyne was designated the Office of Research and Technology Applications (ORTA) Representative and Technology Transfer (T2) Manager at Naval Surface Warfare Center Crane Division (Crane), a Navy laboratory located in rural Indiana, hours away from any major urban area. Location notwithstanding, Crane has become a beacon of light in the United States, an innovative engineering center that solves tough technological challenges for national security. The lab employs over 2200 scientists, engineers, and technicians to fulfill its mission in the areas of electronic warfare, strategic systems (e.g., microelectronics, counterfeit detection, anti-tamper, etc.), and special missions (Special Forces hardware and weapons systems such as small arms and night vision, etc.).

When Pyne assumed leadership of the Crane T2 program, she inherited an award-winning program. While it was successful, the program was really a "startup" that had demonstrated its potential value to the lab and potential partners through vigorous T2 efforts. Ms. Pyne rode the crest of that wave and provided what was required to take the program to the next plateau—the leadership and management skillset that built the infrastructure to transform a "startup" capability to a highly viable and sustainable program—a T2 program that executes the lab's outreach through individual strategic partnerships and innovative transactions.

Pyne has demonstrated exceptional service and leadership, innovative approaches to T2, and dramatic impact. During her tenure, a record number of licenses and cooperative R&D agreements have been signed; a record number of invention disclosures and patents have been filed; Crane has won (to date) three national and two regional FLC awards; and has successfully attracted and leveraged approximately $1M in government funding and university resources for T2 activities.

The future is wide open, and the impact of Pyne's T2 program appears to be unlimited. The Lilly Endowment (founded originally with stock from the Eli Lilly Company) recently established a $16M grant for joint collaboration between Crane and local universities—T2 is specifically cited in the grant. The governor of Indiana recently announced a 10-year $1B initiative for innovation and entrepreneurship, with Crane and its assets as key components. Pyne's T2 program is at a critical juncture where the lab can engage and collaborate with non-federal entities, opening doors never before opened. Simply put, Crane T2 has a seat at the table due to Pyne's leadership.

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Fizie Haleem

MONTGOMERY COUNTY ECONOMIC DEVELOPMENT CORPORATION
The future starts in Montgomery.

(Formerly of) Montgomery County Department of Economic Development

Fizie Haleem recently retired as the Technology Transfer and Government Contracting Coordinator for the Montgomery County Department of Economic Development (now called Montgomery County Economic Development Corporation) in Maryland. Montgomery County has one of the highest concentrations of federal labs in a single jurisdiction. The county is home to 18 federal agencies or installations. Since 2008, the Montgomery County Department of Economic Development has engaged with these laboratories collectively through the Federal Laboratory Consortium for Technology Transfer's (FLC) Mid-Atlantic Region (FLC-MAR), one of six regions that compose the FLC.

Thanks to Ms. Haleem's leadership, the *2012 FLC Annual Report to the President and Congress* mentioned Montgomery County as a model of how economic development organizations can form synergistic relationships with federal entities. Ms. Haleem created and nurtured these relationships on a number of fronts. She launched the Technology Transfer Speaker Series, enabling federal labs and universities to speak about their capabilities, features and possible collaboration opportunities at incubators or other county venues. The result of this monthly forum has been a direct connection of more than 300 entrepreneurs to federal labs and universities.

Ms. Haleem was instrumental in creating Montgomery County's Gateway for Innovation: Federal and Academic Technology Transfer and Commercialization. The Gateway features an interactive portal that provides an innovative pathway to tech transfer services and resources available in the county. It also provides brochures and related tech transfer materials from the county's 18 federal labs.

Notable among Ms. Haleem's major contributions was working with the FLC-MAR Regional Coordinator to leverage its annual meeting and Montgomery County's I2C Conference. The FLC-MAR annual meeting runs 1 1/2 days, with the last half day being an industry day. On the industry half-day, the FLC invites companies to sit on a panel to discuss improving partnering with federal labs. The one-day I2C Conference has three panels on innovation, commercialization and financing that showcase its successful technology-based businesses and the efforts of the federal labs. In 2015, the annual FLC-MAR meeting and I2C Conference were combined. Because of this leadership, the quality of the FLC-MAR industry day was greatly improved by a large attendance (about twofold), more prominent speakers, and stronger community support (the Montgomery County Executive hosted the FLC-MAR awards ceremony).

New Jersey Transit Microgrid Research, Development and Deployment/TransitGrid Project

Department of Energy
Sandia National Laboratories

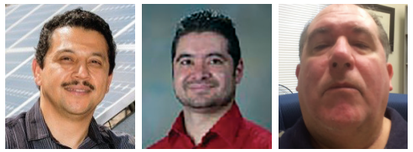
Sandia National Laboratories

After a number of serious storms, culminating in Superstorm Sandy in 2012, which caused billions of dollars in damage and closed parts of the transit system, New Jersey Transit Corporation (NJT), the state-owned public transportation system, wanted to reduce its vulnerability to the loss of electric power caused by natural or manmade disasters.

A Memorandum of Understanding (MOU) between the Department of Energy (DOE), NJT, the New Jersey Board of Public Utilities, and Sandia National Laboratories was announced on August 26, 2013, after the Hurricane Sandy Rebuilding Task Force was charged by President Obama with identifying and working to remove obstacles to resilient rebuilding while considering existing and future risks.

Sandia National Laboratories was brought in by the DOE based on its prior work in microgrid research and development for more than 20 military bases. Its partnership with NJT uses a measurable risk-assessment approach called the Energy Surety Microgrid™ (ESM), a design methodology developed at Sandia.

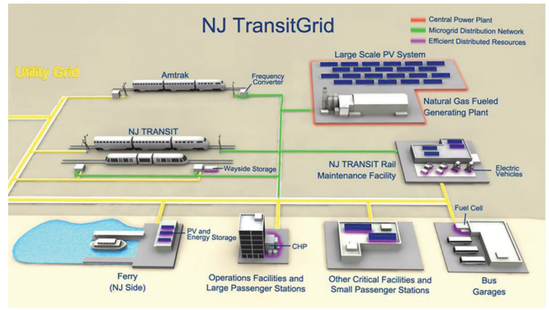
After completing the initial design, New Jersey was awarded $410 million from the Department of Transportation (DOT) to develop NJ TRANSITGRID, a first-of-its-kind electric microgrid for transportation capable of supplying highly reliable power. With the DOT funding in place, an umbrella Cooperative Research and Development Agreement with a total value of over $1 million was signed so that Sandia could continue working with the state on furthering development of NJ TRANSITGRID.



Left to right: Abe Ellis, Jason Martinez, Nick Marton

Contact: Jackie Kerby-Moore, (505) 845-8107, jskerby@sandia.gov

The NJ TRANSITGRID is a groundbreaking project for several reasons. It is the first critical civilian application of a design methodology originally developed for military installations. The project will help identify and address gaps that challenge the widespread deployment of microgrids, including regulatory implementation. When successfully completed, the NJ TRANSIT project will be a model to guide the application of resilient microgrids to other critical infrastructure.



Draft NJ TRANSITGRID conceptual design as provided by Sandia National Laboratories. The concept continues to evolve as design progresses.

One of the greatest successes of this project and collaboration is bringing resilient energy to the forefront of discussions about improving infrastructure. For the first time, a smart microgrid is being designed for a core segment of a large-scale transportation system, involving multiple states, jurisdictions, agencies, and complex legal issues.

The threats to public transportation and other public services due to both natural and manmade disasters are ever-present, and the NJ TRANSITGRID represents a real, achievable solution to preparing for these high-consequence events. Additionally, the size of this project has attracted the interest of other major cities and organizations, and its success may well mean more resilient energy projects in the future.

Development and Transfer of the Agricultural Conservation Planning Framework

U.S. Department of Agriculture - Agricultural Research Service
National Laboratory for Agriculture and the Environment

The enhancement of water quality within an agricultural watershed requires the implementation of a suite of practices strategically placed within the watershed. What has been lacking is a rigorous framework by which to determine where conservation practices would be effective when placed in a watershed. Determining the placement of diverse agricultural conservation practices onto a landscape has been a goal of a variety of governmental and non-governmental groups; however, progress has been hampered by the lack of a robust framework for decision-making.

The Agricultural Conservation Planning Framework (ACPF) was developed in response to a broad set of stakeholders and their expressed need for a Geographic Information System (GIS)-based tool that could identify where different practices could be implemented within a watershed for maximum benefits for improved water quality. The ACPF combines an understanding of how water moves across a landscape using a GIS-based combination of topography, attributes of the watershed (roads, field boundaries, etc.), precipitation, and land use patterns to determine the flow paths of water across a given landscape, and then determines the most vulnerable parts of the watershed that need to be protected and the most effective options and locations for implementing these practices to achieve that protection.

The advantage of this technology is that it facilitates the evaluation of potential risks for pollutant transport within a given watershed and provides a means of exploring potential placement of practices to mitigate those risks. Watersheds are not the same, and each requires a different combination of practices to achieve water quality goals. The ACPF is the first attempt to provide a robust technology that provides a technique for the effective placement of conservation practices across a watershed. A team from the USDA-Agricultural Research Service, located at the National Laboratory for Agriculture and the Environment in Ames, Iowa, led by Mark Tomer with assistance from David James and Sarah Porter, constructed the ACPF system and have been responsible for the training sessions conducted with watershed groups across the Midwest. These activities began in August 2014 and continue with more training sessions scheduled for 2017. In addition, feedback from participants has fostered the development of a version of ACPF now available to the public through a web portal. The ACPF tool has provided a structure for all parties within a watershed to explore the most-effective conservation practices and where they would have the most benefit to water quality. These efforts demonstrate the value of partnerships with stakeholders to answer a critical question and deliver the technology necessary to answer those questions.

Not pictured: David James, Sarah Porter, Dr. Mark Tomer

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NoMonia: A Process to Remove Ammonia from Drinking Water

Environmental Protection Agency
National Risk Management Research Laboratory

Under the Safe Drinking Water Act, the Environmental Protection Agency (EPA) sets maximum contaminant levels that apply at the entry point into a distribution system rather than within the distribution system. Because monitoring contaminants is not normally conducted at the consumer's tap, their presence can go undetected. If nitrification resulting from elevated ammonia levels in the source water occurs in the distribution system, elevated and potentially dangerous levels of nitrites and nitrate can reach the consumer.

In October 2014, the EPA's National Risk Management Research Laboratory in Cincinnati, Ohio, partnered with AdEdge Water Technologies, LLC, of Duluth, Georgia, to develop and commercialize an EPA-designed and -patented technology that brings the process of oxidizing ammonia in drinking water to the point of practical application. Together, the EPA and AdEdge have collaborated to evaluate a two-stage aerobic treatment system for the removal of ammonia from drinking water. The treatment approach enhances the natural nitrification process during which, in the presence of oxygen, ammonia 3 is converted to nitrite and then to nitrate. AdEdge licensed the technology and is marketing it as NoMonia, an innovative water treatment technology to remove ammonia, arsenic, iron, and manganese.

Many regions in the United States have excessive ammonia in their source waters as a result of natural or agricultural sources. While ammonia in water does not pose a direct health concern, nitrification of significant amounts of ammonia may. Ammonia in water may create high chlorine demand for disinfection (if addressed by breakpoint chlorination). In the presence of total organic carbon, excess chlorine is a concern due to the creation of disinfection by-product. High ammonia levels may interfere with the removal of other regulated contaminants such as arsenic, iron, and manganese. Ammonia in raw water may also result in nitrification in the distribution systems, and can cause corrosion, poor taste, and odor issues. Legacy treatment approaches for the removal of ammonia, such as ion exchange or reverse osmosis, generate high total dissolved solids (TDS) wastewater, a challenge that the NoMonia biological treatment process eliminates. As a product of the collaboration, a pilot demonstration is being conducted in Gilbert, Iowa, with the intent to implement a design for a full-scale system in areas where ammonia is an issue.

NoMonia Field Demonstration

NoMonia Pilot-Plant

Left to right: Sarah Bauer, Kathleen Graham, Laura Scalise
Not Pictured: Dr. Darren Lytle, Daniel Williams

Contact: Julius Enriquez, (513) 569-7285, enriquez.julius@epa.gov

REGIONAL AWARD WINNERS

FLC NATIONAL AWARDS

The FLC congratulates the following winners for their outstanding technology transfer efforts in their respective regions in 2016.

Far West

Outstanding Technology Development Award

Horticultural Research Unit, USDA Agricultural Research Service
"Outstanding Commercialization Success Development of New Berry Varieties"

NASA Armstrong Flight Research Center
"NASA's Sense-and-Avoid System with ADS-B Avionics for Unmanned Aerial Systems"*

NASA Jet Propulsion Laboratory
"CMOS – Complementary Metal-Oxide-Semiconductor"

Pacific Northwest National Laboratory
"Electro-static Rapid Expansion of Supercritical Solutions for Medical Devices (eRESS)"

Laboratory Representative of the Year

Janeya Griffin
NASA Armstrong Flight Research Center

Outstanding Partnership Award

Lawrence Livermore National Laboratory
"Environmentally Sound Geothermal Silica Extraction Technology"

Sandia National Laboratories
"Hydrogen Station Equipment Performance Device"

Outstanding Technology Development Award

Idaho National Laboratory
"Electrochemical Recycling Electronic Constituents of Value (E-RECOV)"

Lawrence Livermore National Laboratory
"Wireless Battery Sensing and Failure Eliminator"

NASA Ames Research Center
"Pegasus 5.2: Software for Automated Pre-Processing of Overset CFD Grids"

NASA Armstrong Flight Research Center
"NASA's Towed Glider Air-Launch System (TGALS)"

NAVAIR In-Service Support Center (ISSC)
North Island, Advanced Aircraft Technologies Team
"F/A-18 Landing Gear Strut Operational Readiness Monitoring (STORM) System"

SPAWAR Systems Center Pacific
"Graphene-based Technologies Using Liquid Metal Electrodes"

Mid-Atlantic

Excellence in Technology Transfer Award

National Institute of Standards and Technology
"Adaptation of Energy and Monitoring Technology from Laboratory to Industry"

Naval Research Laboratory
"CT-Analyst®"*

Naval Research Laboratory
"Siloxane-Based Non-Skid Coating"*

USDA ARS National Center for Cool and Cold Water Aquaculture
"Vaccine Developed Against an Emerging Pathogen Threatening U.S. Aquaculture"

USDA ARS Genetic Improvement for Fruits and Vegetables
"Elkton Potato"*

Educational Institution and Federal Laboratory Partnership Award

USDA - Princeton Plasma Physics Laboratory

Interagency Partnership Award

USDA Agricultural Research Service
USDA Animal Plant Health and Inspection Service

Laboratory Director of the Year Award

Dr. Chavonda Jacobs-Young
USDA Agricultural Research Service

Rookie of the Year Award

Andrew Burke
National Cancer Institute

State and Local Economic Development Award

USDA Agricultural Research Service
"The ARP Network"

Mid-Continent

Excellence in Technology Transfer Award

Los Alamos National Laboratory
"PathScan: Security Analytics Software for Network Attack Detection"

Sandia National Laboratories
"SEARCH: The Selection, Evaluation and Rating of Compact Heat Exchangers (SEARCH) Software Suite"*

Technology Transfer Professional of the Year

Debra Covey
Ames Laboratory

Notable Technology Development Award

Air Force Research Laboratory Directed Energy Directorate
"Fiber Laser & Beam Combining Team"

Bureau of Reclamation
"Flexible Magnetic Flux Probe"

Los Alamos National Laboratory
"Pulmonary Lung Model (PuLMo)"

NASA Johnson Space Center
National Renewable Energy Laboratory
"Battery Internal Short Circuit (ISC)"

Sandia National Laboratories
"Gaze Appraise: Eye Movement Analysis Software"

USDA Agricultural Research Service
"Transfer of Genetic Resources Information and Germplasm"

Midwest

Excellence in Technology Transfer Award

Argonne National Laboratory
"Magnetic Nanomaterials for Microwave Devices"

NSWC Crane Division
"Tunable Detection System Technology"

Partnership Award

Purdue Research Foundation
"Rising Above: Exceeding Expectations of a PIA Partnership"

Regional Coordinator's Excellence Award

Kimberly Dalgleish-Miller
NASA Glenn Research Center

Regional Appreciation Award

Mary Motyka
McKean Defense Group

Northeast

Excellence in Technology Transfer Award

Air Force Research Laboratory Information Directorate
"Targeted Event Detection and Prediction"

Regional Appreciation Award

Thomas Kuegler
Wasabi Ventures

Regional Laboratory Award

Air Force Research Laboratory Information Directorate

Southeast

Excellence in Technology Transfer Award

USDA ARS Dale Bumpers Small Farms Research Center
"Control of Internal Parasites in Sheep and Goats"

Interagency Partnership Award

USDA ARS Southeast Area
USDA ARS Beltsville Area
Environmental Protection Agency
USDA National Resources Conservation Service
University of Georgia
"By-Product Gypsum to Reduce Runoff Pollution and Improve Water Quality"

** Also a 2017 national award winner*

FLC AWARDS COMMITTEE

The FLC expresses its gratitude to the members of the Awards Committee for their tireless efforts in making the 2017 awards program a success.

Donna Bialozor
National Cancer Institute
(Committee Chair)

Mojdeh Bahar, JD, MA, CLP
USDA ARS Beltsville Area

Dr. Sudeep Basu
Frost & Sullivan

Dr. Theresa Baus
Naval Undersea Warfare Center
Division Newport

Dr. Sabarni Chatterjee
National Institutes of Health

Patricia Doutriaux
Naval Research Laboratory (retired)

Dr. Sevim Erhan
USDA ARS Eastern
Regional Research Center

Hannah Farquar
Lawrence Livermore National Laboratory

Dr. Suzanne Frisbie
National Institute of Allergies and
Infectious Diseases

Whitney Hastings
Food and Drug Administration

Amanda Horansky-McKinney
Naval Research Laboratory

Gary Jones
Federal Laboratory Consortium
for Technology Transfer

Dr. Katherine Lipka
Henry M. Jackson Foundation

Marianne Lynch
Department of Energy

Carolyn McMillan
Marshall Space Flight Center

David Missal
Riverside Research

Michele Newton
National Cancer Institute

Melissa Ortiz
Air Force Research Laboratory

Jeff Pixton
National Radio Astronomy Observatory

Gail Poulos
USDA ARS Beltsville Area

Keith Quinn
Air Force Research Laboratory
Propulsion Directorate

Johnette Shockley
U.S. Army ERDC - Cold Regions
Research and Engineering Laboratory

Dr. Thomas Stackhouse
National Cancer Institute

Marc Suddleson
National Oceanic and
Atmospheric Administration

Mark Surina
U.S. Transportation Command

Dr. Joseph Teter
Naval Surface Warfare Center,
Carderock Division

Kathryn Townsend
Naval Meteorology and
Oceanography Command

Rosemarie Truman
Pacific Northwest National Laboratory

David Yang
National Cancer Institute

Dr. Hailing Yu
Volpe National Transportation
Systems Center

Dr. Xiao-Ying Yu
Pacific Northwest National Laboratory

Paul Zielinski
National Institute of Standards
and Technology

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

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

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

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

August/September
Nomination forms for all categories are distributed via email and 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/May
Award winners register for FLC national meeting; awards presented at FLC national meeting.

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