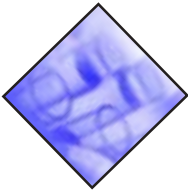




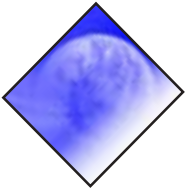
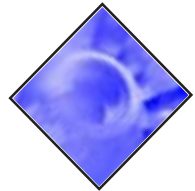
2003 flc Awards program



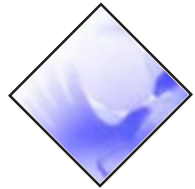
May 7, 2003



FLC Mission: The FLC shall provide the forum for education, training, and laboratory networking to enhance professional development and recognize excellence in federal technology transfer.



FLC Vision: The FLC membership will be the recognized leaders for the transfer of federal technology to the marketplace.



Welcome to the FLC Awards Program

Thank you for attending the 2003 FLC Awards Program. Expect an exciting evening, as the FLC salutes its best and brightest. The FLC's success is due largely to those government scientists and technical personnel who pursued their visions and ideas, and took them from the drawing board to actual use.

Equally important are the people in federal labs who have dedicated themselves to encouraging and initiating partnerships with the private sector to make technology an invaluable part of our lives.

As the technology transfer efforts within the FLC are diverse in their scope and large in number, we are pleased to present awards in the following areas:

- **Excellence in Technology Transfer**—Presented to individuals in the FLC who have successfully transferred federally developed technologies.
- **Laboratory Director of the Year**—Recognizes directors of FLC member laboratories for their contributions to the overall enhancement of technology transfer for economic development and their support of the FLC and its activities.
- **Service Awards**—Presented to individuals, inside or outside the FLC, who have provided significant support to the technology transfer process, furthering the FLC's mission.

The FLC awards are a prestigious honor in the technology transfer world, with dozens of federal laboratories submitting nominations each year. These awards have become not only a crowning achievement for the winning laboratories, but a great source of pride for their government agencies.

As you read this booklet, you will be impressed with how these individuals worked together to use their experience, expertise, and resources to create technologies and products that have an impact on our daily lives. I am extremely proud and pleased to present the recipients of the 2003 FLC awards.



Victor Chavez
Awards Committee Chair



FLC AWARDS
FOR
EXCELLENCE IN TECHNOLOGY TRANSFER

*Department of Agriculture
Agricultural Research Service, Pacific West Area
Western Regional Research Center*

Innovative Fruit Processing for Promoting Health and Sustainable Rural Communities

Cutting-edge research conducted by Dr. Tara McHugh and Dr. Charles Huxsoll has led to the development of a new industry to manufacture 100% fruit and vegetable products. These new products can be made from fruits and vegetables that are too small or have cosmetic imperfections, and thus cannot be sold as fresh produce. These fruits and vegetables are converted to purees and refrigerated. The purees are then used to form edible pieces, bars, and novel shapes such as straws, sausage casings, and film barriers to wrap other food products.

To successfully transfer this technology, Drs. McHugh and Huxsoll have initiated numerous partnerships with numerous companies, among them HR Mt. Sun, Hadley Yosemite Farms,

Yorkshire Dried Fruit & Nut Co., Mead Johnson & Company, and Gilroy Foods. The technology transfer from these partnerships is in varying stages, from prototype development to licensing and production.

The products resulting from this team's technology offer a unique mix of benefits to the general public. This technology is expected to increase fruit and vegetable consumption in the U.S. In addition, American produce growers will find that their production will have increased value since they will be able to make use of produce that cannot be sold in a retail setting.

Contact: [Dr. Tara McHugh, \(510\) 559-5864, thm@pw.usda.gov](mailto:thm@pw.usda.gov)



Dr. Tara McHugh



Dr. Charles Huxsoll

*Department of Commerce
Office of Coast Survey
National Ocean Service*

Electronic Commerce and Print-on-Demand for Nautical Charts

Nautical charts are a fundamental tool of marine navigation. Hundreds of critical changes occur to them every week. Unfortunately, traditional printing methods required as many as 38 weeks to print new editions, which meant that charts were dangerously out-of-date when they rolled off the press. To remedy this problem, a team from the Office of Coast Survey developed large format, full-color, variable data, on-demand printing technology. This technology prints charts only when ordered and from digital files that are updated daily. The team also developed electronic commerce software (www.NauticalCharts.gov) for chart ordering, and which controls the automatic assembly and printing of charts from the up-to-date digital files.

Through a CRADA between the Office of Coast Survey team and OceanGrafix, LLC of St. Paul, Minnesota, an industrial-strength Print-on-Demand/e-Commerce system was built. Today, the National Oceanic and Atmospheric Administration (NOAA) and OceanGrafix are jointly using the system to produce NOAA's suite of 1,000+ nautical charts.

The benefit of this technology is having current nautical charts to help mariners meet federal regulations and avoid catastrophic marine accidents. In addition, this technology avoids the annual \$17.5 million cost to correct charts by hand and reprint them.

Contact: [David Enabnit](mailto:David.Enabnit@noaa.gov), (301) 713-2770 x132,
Dave.Enabnit@noaa.gov

Electronic Commerce and Print-on-Demand for Nautical Charts Team



David Enabnit



Barbara Gray



Norman Smith



Thomas Loeper



Richard Sillcox

Design, Development, Training, Fielding, and Continued Consultation for Mobile Laboratories

In the event of a chemical, biological or radiological terrorism attack, first responders, military leaders, and federal agencies need tools that will allow them to sample and analyze materials in a precise and uniform manner. A team from the Edgewood Chemical Biological Center (ECBC) has been active in all aspects of improving mobile laboratories and providing solutions for the efficient and accurate field analysis of chemical and biological materials. The technologies developed by this team include the development of turnkey capabilities that integrate and standardize field sampling, as well as analysis tools that support users. Additionally, the technologies address regulatory issues concerning transportation, environmental law, and safety compliance.

Numerous partnerships using CRADAs, patents, license agreements, and transfer mechanisms contributed to the success of the project. Often, one successful effort precipitated work with another partner. To date, those partners include Purified MicroEnvironments, Quick Silver Analytics, Inc., the FBI, and the U.S. Food and Drug Administration.

Both the public and private sectors have directly benefited from ECBC's mobile laboratory technologies. This team has provided improved strategies that will ultimately enhance law enforcement efforts to protect the U.S. against terrorism and the threat of weapons of mass destruction.

Contact: [Monica Heyl, \(410\) 436-8616,
monica.hey1@sbccom.apgea.army.mil](mailto:monica.hey1@sbccom.apgea.army.mil)

*Design, Development, Training, Fielding, and
Continued Consultation for Mobile
Laboratories Team*



From left: Charles Henry, Monica Heyl, and Dr. Dennis Reutter

Antibody Engineering for Expression in Insect Cells and Larvae

This technology addresses an advanced method for manufacturing recombinant proteins in insect cells and larvae. It consists of genes for a recombinant antibody that binds a biological warfare agent (botulinum toxin). The genes were cloned in a way that makes it possible to produce the antibody in insect larvae.

Antibodies are currently deployed as the recognition component of sensors that detect biological threat agents.

The Edgewood Chemical Biological Center (ECBC) team is transferring this technology through a partnership with Chesapeake PERL (C-PERL), a company based in College Park, Maryland. By way of a CRADA, C-PERL scientists are pioneering a technology that

transforms insect larvae into miniature protein factories. This is the latest attempt to manufacture biological material for use in a new generation of medicines and diagnostic tests.

The CRADA has proven to be successful for both ECBC and C-PERL. In particular, the partnership enabled C-PERL to more than double the size of its staff. Last year, the company won the Maryland Biotech/Life Sciences Incubator Company of the Year Award and was featured in over 20 news articles—including *Fortune Magazine's* “Coolest Companies of 2002.”

Contact: [Dr. Kevin O'Connell, \(410\) 436-5999, kevin.oconnell@sbccom.apgea.army.mil](mailto:Dr. Kevin O'Connell, (410) 436-5999, kevin.oconnell@sbccom.apgea.army.mil)



Patricia Anderson



Terry Chase



Dr. Kevin O'Connell

Not pictured - Dr. James Valdes

Small-Scale Cogeneration of Heat and Electric Power

The first practical small-scale cogenerator, developed by the team of Don Pickard and Frank Dileo, efficiently provides the energy needs of a battalion-level field kitchen. Cogenerators produce heat and electric power from one process 80 percent more efficiently than separate heaters and generators. Instead of using dry saturated or



Frank Dileo

superheated steam as in a conventional Rankine cycle, a high temperature two-phase mixture of steam and water is injected into an expander. The alternator coupled to the expander produces electrical power, while the remaining heat is used for cooking and sanitation.

The Natick Soldier Center team has been involved in the discovery and exploitation of cogeneration for the past five years. They joined forces with engineers at Yankee Scientific, a Medfield, Massachusetts-based company, to adapt the liquid injection

cogeneration (LIC) process to field kitchens. The resulting prototype was a success and led to the two largest home HVAC manufacturers expressing an interest in the cogenerator. The technology was formally transferred when Yankee Scientific and ECR International formed a joint venture called Climate Energy LLC to develop and market the technology. In 2001 the technology was fully developed and tested with kitchen appliances, and it was integrated into a fully functioning kitchen in 2002.



Don Pickard

Electric power generation using small-scale cogenerators offers significant environmental advantages and other benefits when compared to conventional power plants—less fuel is burned, the fuel burned is cleaner, and the fuel is burned over a broad area, unlike the concentrated pollution produced by power plants.

Contact: Don Pickard, (508) 233-5036,
don.pickard@natick.army.mil

Optical Real-Time Adaptive Spectral Identification System

The Optical Real-Time Adaptive Spectral Identification System (ORASIS) is a software application for the analysis and compression of hyperspectral images that is based on a patented algorithm from the Naval Research Laboratory (NRL). Hyperspectral images are composite images made up of multiple pictures of a “scene” taken at different wavelengths. This technology mathematically identifies constituent components and maps their abundances within the image.

Through the efforts of Dr. Jeffrey Bowles, ORASIS has been transferred to Advanced Power Technology, Incorporated (APTI) under the terms of a nonexclusive license with NRL.

Using the technology, the licensee is selling value-added earth image analysis products and services, such as customized maps, and systems for remote sensing data collection and analysis.

The earth image products from ORASIS will be used for oil, gas, and mineral exploration; environmental assessment; crop analysis for optimizing irrigation and fertilization; and military remote sensing. Based on the array of areas in which the technology can be applied, the individuals, businesses, agencies, etc., that will benefit range from doctors and patients to farmers, manufacturers and oil companies.

Contact: Dr. Jeffrey Bowles, (202) 404-1021,
Jeffrey.Bowles@nrl.navy.mil



Dr. Jeffrey Bowles

Globus Toolkit™

The Globus Toolkit™ is a community-based, open-architecture, open-source set of software services and libraries that support computational grids. A grid connects geographically and organizationally dispersed resources, including large-scale computers, archival storage systems, scientific and engineering instruments, and human collaborators. This technology, developed by a team at Argonne National Laboratory (ANL), has already transformed collaborative scientific research across the world and is the basis for new distributed computing strategies of such companies as IBM, Microsoft, Platform Computing, Entropia, Sun Microsystems, and Compaq.



***From left: Dr. Ian Foster,
Dr. Carl Kesselman and
Steven Tuecke***

The team has been able to transfer the technology with contributions from IBM and Microsoft, as well as funding from the National Science Foundation and the Department of

Energy. The transfer of the Globus Toolkit™ to the marketplace took a huge turn in 2001, when 11 of the top information technology companies committed to incorporating the toolkit as a standard mechanism for their grids.

Once it is widely available, virtually every computer user will benefit from this technology. The Globus Toolkit™ will permit individuals and organizations to make decisions based on the best available technology to meet their local needs and

policies, instead of basing decisions more on interoperability and compatibility rather than functionality.

Contact: Dr. Ian Foster, (630) 252-4619,
foster@mcs.anl.gov

Visualization Tool for Alignments (VISTA)

In the field of comparative genomics, scientists can compare the human genome with those of other organisms to identify common regions of DNA; gain insights into how genes are switched on and off; and further their understanding of the human genome's evolution, structure and function. In some ways, sequencing the human genome was the easy part; the more difficult task of understanding and analyzing the functions of nucleotide pairs in human cells still lies ahead. Recognizing this need, a team from Lawrence Berkeley National Laboratory (LBNL) developed a user-friendly computer program called Visualization Tool for Alignments (VISTA), which allows researchers to quickly compare the genomes of various organisms.

This technology was conceived, developed, and transferred by a team of biologists, mathematicians, and computer scientists at LBNL and the University of California at Berkeley (UCB). The VISTA team implemented a seamless technology transfer process to maximize the program's accessibility. By making the program publicly

available online via a dedicated server (<http://www-gsd.lbl.gov/vista>), the team made it possible for researchers to register and submit genome sequences for comparison electronically. Licenses for VISTA are available free of charge to academic and nonprofit organizations. Commercial institutions may purchase site licenses on the Web. Currently, VISTA is accessed on the web an average of almost 1,700 times per month.

Since its public introduction, VISTA has become one of the most popular and widely praised comparative genomics tools available to biologists, geneticists, and biomedical researchers. This technology is contributing to important research on coronary heart disease, leukemia, cardiac and skeletal muscle development, and genetic disorders. The information it yields is accelerating the understanding of human diseases and disorders, which promises a bountiful harvest of contributions to human health and well-being.

Contact: Inna Dubchak, (510) 495-2419,
ILDubchak@lbl.gov

Visualization Tool for Alignments (VISTA) Team



Alexander Poliakov



Inna Dubchak



Lior Pachter

Not pictured: Kelly Frazer and Nicolas Ray

*Department of Energy
Lawrence Berkeley National Laboratory
Lawrence Livermore National Laboratory
Sandia National Laboratories*

Extreme Ultraviolet Lithography Tool

Years ago, it would have taken a roomful of hardware to match the computing power of today's average laptop computer. One key to progress has been the steady improvement in ultraviolet lithography, the photographic process used to print integrated circuits on computer chips. However, current lithographic technology has reached its limit because its lenses absorb the shortwave extreme ultraviolet light (EUV) needed to print even small chips. A team from Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, and Sandia National Laboratories—working together as the Virtual National Laboratory (VNL)—has developed a next-generation lithography called Extreme Ultraviolet Lithography (EUVL). This technology overcomes the problems of older lithography by using coated mirrors, rather than lenses, to bend and focus the light. As a result, microprocessors can be made that are 10

times faster, with active transistors and memory chips that can store 40 times more information.

EUVL technology and its associated knowledge has been transferred under a CRADA to the Extreme Ultraviolet Limited Liability Company (EUV LLC), a consortium whose members include Advanced Micro Devices, IBM, Infineon, Intel, Micron Technologies, and Motorola. As a result of the CRADA, the technology is making the transition into commercialization.

EUVL will benefit the general public by improving the quality of life through more efficient consumer products and smart machinery, breakthroughs in biotechnology and materials science, and continuing advances in personal computers and the Internet.

Contact: [David Attwood, \(510\) 486-4463, DTAttwood@lbl.gov](mailto:DTAttwood@lbl.gov)

Extreme Ultraviolet Lithography Tool Teams



LBNL team



Glenn Kubiak



LBNL team



Richard Stulen



Sandia team



John Goldsmith

Smart, High-Performance Polyphenylenesulfide Coating System

The development and transfer of the polyphenylenesulfide (PPS) coating system represents a giant step forward in the



Dr. Keith Gawlik

technology can be used in a wide range of applications and is more durable, abrasion-resistant, and less costly than competitive coatings.

To transfer this technology, the team of Dr. Keith Gawlik of the National Renewable Energy Laboratory and Dr. Toshifumi Sugama of Brookhaven National Laboratory used no formally defined procedures. Rather, they relied on their knowledge of the technology and the market, and their professional relationships to quickly move the PPS coating system from the laboratory to production. Bob Curran & Sons, a Texas-based company, needed a coating system to replace the phenolic

technology of coating steel surfaces for use in hostile corrosive environments. The PPS coating system protects surfaces from corrosion, oxidation and fouling, and has a high thermal conductivity that can also repair itself. This

coating base it was using. Drs. Gawlik and Sugama worked with the company to develop and test a commercial version of the

technology. Within nine months, the company made the PPS coating system its primary product, gaining many new customers from the petrochemical processing industry. In addition, this technology transfer effort was recognized with a 2002 R&D 100 Award.



Dr. Toshifumi Sugama

The primary beneficiaries of this technology will be geothermal power plants and the chemical/petrochemical processing industry. The PPS coating system will cut costs, decrease downtime, and increase productivity and output. Considering the enormous markets represented by power plants and the chemical processing industry, the technology's ripple effects on the economy could run into billions of dollars per year.

Contact: Dr. Keith Gawlik, (303) 384-7515, keith_gawlik@nrel.gov

PVSCAN/PV Reflectometer

The PVSCAN is a photovoltaic (PV) scanning analyzer for use by the semiconductor industry. It is an optical system that rapidly scans, maps, and characterizes defects present in PV wafers and cells while measuring the photoresponse of cells. The use of PVSCAN can increase the yield of high-quality wafers for processing. The PV Reflectometer is an instrument that is used for the inline monitoring of several solar-cell fabrication steps for all solar cell technologies, especially silicon PV technology.



Dr. Bhushan Sopori

Dr. Bhushan Sopori, the inventor of both technologies, initiated the technology transfer process. Through licensing and other transfer

mechanisms, Dr. Sopori established a partnership with GT Equipment Technologies, Inc. (GTi), a company that provides manufacturing equipment to the semiconductor and materials industries. Within months of the partnership's formation, the first PVSCANs were shipped to customers, and there are prospective customers for the PV Reflectometer.

The primary users of both technologies will be those in the international PV community. A secondary market includes the thin-film PV community and part of the semiconductor industry, such as those who make solid-state lasers or diodes.

Contact: [Dr. Bhushan Sopori, \(303\) 384-6683, bhushan_sopori@nrel.gov](mailto:Dr. Bhushan Sopori, (303) 384-6683, bhushan_sopori@nrel.gov)

High Speed Vaccine Injector System

Providing fast, large-scale inoculations without spreading blood-borne pathogens is a longstanding veterinary and human healthcare challenge. Needle-free systems offer important advantages over traditional syringe and needle systems—reduced pain, improved worker safety, safer disposal of potentially dangerous needles and related waste, and lower costs. The Needle-Free High Speed Vaccine Injector System, developed by a team at the NNSA Kansas City Plant, solves this problem. The injector pushes into the patient a very small stream of vaccine under high pressure through a nozzle covered with a disposable protective cap and. Up to 600 injections per hour are possible with this technology.

The technology was developed through a partnership between the operator of the Kansas City Plant, Honeywell Federal Manufacturing and Technologies; Felton International; and three Russian companies. Plans for 34

different injectors are in the process of completion, at which time the Russian companies will manufacture the parts, and Felton International will handle assembly, marketing and distribution.

While the initial application of the Needle-Free High Speed Vaccine Injector System was for veterinary use, human patients will be the ultimate beneficiaries. For healthcare workers, the technology eliminates the danger of needle-stick injury and the need for sharps disposal. Because it has been designed for field use, the injector system is ideal for use when mass inoculations are needed—whether for conventional disease eradication such as measles, or for emergency response in case of biological attack.

Contact: [Paul Quirk, \(816\) 997-2457](tel:(816)997-2457),
pquirk@kcp.com

High Speed Vaccine Injector System Team



Any Source, Any Position Fluid-Handling Device

The Any Source, Any Position (ASAP™) fluid-handling system is an enabling technology for analytical dispensing tools used for biochemical analysis. This technology rapidly transfers small volumes of chemicals in parallel from multiple sources to multiple targets—the type of manipulation necessary when performing the vast number of chemical assays required for screening pharmaceuticals or analyzing genetic material.

The ASAP™ fluid-handling system was conceived jointly by Oak Ridge National Laboratory and Rheodyne, L.P. Patent licenses for the technology were obtained by Rheodyne,

which created a spinoff company, Innovadyne. Innovadyne owns the worldwide exclusive license and ASAP™ trademark. The ASAP™ received an *R&D Magazine*'s R&D 100 Award in 2002.

The benefits of this technology to the consumer include faster discovery, development, and availability of new drugs; quicker medical diagnoses; and reduced costs for both.

Contact: [Mitchel Doktycz, \(865\) 574-6204, Doktyczmj@ornl.gov](mailto:Doktyczmj@ornl.gov)



***J. Steven Hicks and Mitchel J. Doktycz
Not pictured: James E. Johnson***

Automated Image Retrieval for Semiconductor Yield Improvement

A team of researchers at Oak Ridge National Laboratory (ORNL) developed the capability for a flexible content-based image retrieval technology and software system called Automated Image Retrieval (AIR). This patented technology is used to facilitate the use, reuse, and management of the hundreds of thousands of images maintained in semiconductor wafer manufacturing environments.

The technology was invented under an ORNL seed money effort and licensed to Applied Materials, Inc. of Santa Clara, California, for integration into its Defect Source Identifier™—Automated Image Retrieval software product (DSI™-AIR). ORNL's technology received *R&D Magazine's* R&D 100 Award in 2002.

The semiconductor industry can achieve significant economic and energy gains by improvements in the device yield brought about by the use of the DSI™-AIR system. The semiconductor industry is worth about \$350 billion per year to the U.S. economy. Therefore, a modest yield improvement of 0.1% could be worth on the order of several hundred million dollars to the economy. Energy gains can also be significant because of lower electric power consumption, reduced water usage, and less hazardous waste production.

Contact: [Dr. Kenneth Tobin](mailto:tobinkwjr@ornl.gov), (865) 574-8521,
tobinkwjr@ornl.gov



**Front row, from left: Bobby R. Whitus, Regina K. Ferrell,
and Kenneth W. Tobin**

**Back: W. Bruce Jatko, Thomas P. Karnowski, and Shaun
S. Gleason**

Not pictured: Amos Dor, Barry Wong, and Yifa Gavra

Expression Data Clustering Analysis and Visualization Resource

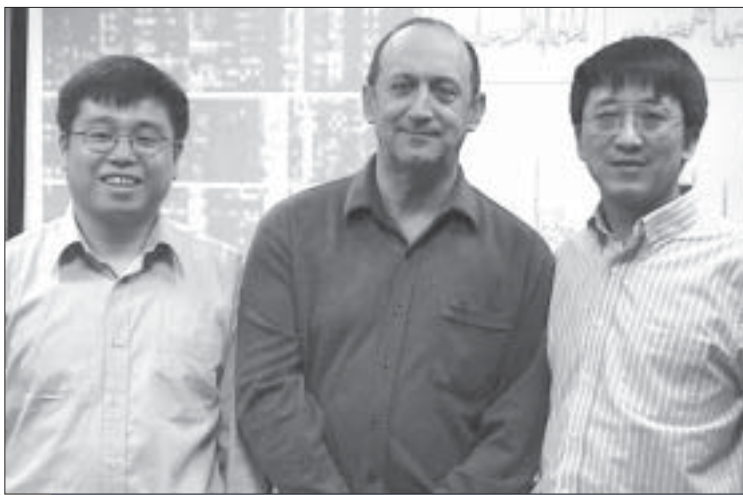
The Expression Data Clustering Analysis and Visualization Resource (EXCAVATOR) is a patentable computer package for gene-expression data clustering and analysis. It enables researchers to more efficiently “mine” key information from massive amounts of gene expression data. With EXCAVATOR, even researchers with limited computer skills can analyze gene-expression data in seconds. With this information, genetic diseases can be diagnosed more quickly.

Once this technology was successfully developed by the Oak Ridge National Laboratory team, several commercial companies expressed a strong interest in obtaining licensing. ApoCom Genomics, a Knoxville, Tennessee-based company, received

licensing rights for EXCAVATOR in 2002. Currently, ApoCom is marketing the technology and providing user support.

EXCAVATOR’s capabilities will help researchers understand related biological processes in diseases and develop better methods for diagnosis and targeted treatment. For example, leukemia patients can be divided into several groups according to their genotypes. Then, each group of patients can take a specific medicine to maximize the treatment’s effectiveness while minimizing potential side effects.

Contact: Ying Xu, (865) 574-7263,
xuyl@ornl.gov



Left to right: Dong Xu, Victor Olman, Ying Xu

ORNL Carbon Composite Bipolar Plate

To meet energy conservation and pollution reduction goals, the Department of Energy is encouraging the development of fuel cell-powered electric vehicles. The proton exchange membrane (PEM) fuel cell is a likely candidate to power vehicles because it starts quickly, operates at low temperatures, and creates no pollution. However, current PEM fuel cells are too heavy and too expensive for practical use in vehicles. Their machined graphite electrodes account for most of their weight and cost. The Carbon Composite Bipolar Plate was developed to meet the need for a lightweight, economical replacement part for the machined graphite electrodes used in PEM fuel cells.

Porvair Fuel Cell Technology, a Hendersonville, North Carolina-based company, has licensed the patented technology from ORNL. Porvair is interested in very large-scale production of the plates—in excess of 1 million per year. The company has acquired clients and plans to upgrade production.

Anyone who relies on motor vehicles stands to benefit from this technology. In addition, businesses seeking their own stationary power generators will benefit when low-cost PEM fuel cells become available.

Contact: Dr. Theodore Besmann, (865) 574-6952, besmannm@ornl.gov



ORNL Team, from left: Dr. James W. Klett, Dr. Theodore M. Besmann, Dr. Timothy Burchell, John H. Henry, Jr.



Porvair Team, from left: Jim Stike, Bob Torre, Ken Butcher, David Haack

The Acoustic Inspection Device

Since the terrorist attacks of September 11, 2001, detecting and preventing hidden contraband and weapons of mass destruction from entering through American borders is now a high priority. A team of scientists and engineers from Pacific Northwest National Laboratory (PNNL) is helping to solve this problem by developing the Acoustic Inspection Device (AID), which provides noninvasive examination of sealed containers and helps screen bulk solids. The AID rapidly and reliably discriminates and identifies liquid contents in the sealed containers; determines if there are concealed compartments within the containers; and detects hidden compartments in solid forms that may contain contraband or weapons of mass destruction.

The PNNL team transferred the technology through a licensing agreement to Mehls, Griffin

& Bartek Ltd. (MGB Ltd.), an Arlington, Virginia-based company. In addition, the U.S. Customs Service provided funding to further development of the technology. MGB Ltd. is currently customizing the AID for the Customs Service, which will be a prime user of the technology.

In general, all Americans will benefit from this technology. The AID will help prevent the smuggling of weapons of mass destruction, as well as other contraband or illegal items into the country, while reducing the amount of time trucks and ships must spend at U.S. border crossings—allowing products to get to market faster and more securely than under current inspection procedures.

Contact: [Aaron Diaz](mailto:Aaron.Diaz@pnl.gov), (509) 375-2606,
Aaron.Diaz@pnl.gov

Acoustic Inspection Device Team



*Back row, from left: Larry Reid, Todd Samuel, Juan Valencia, Laurie Berube,
Tom Taylor, Steve Martin*

Front: Aaron Diaz, Brion Burghard, James Skorpik, Richard Pappas

Not pictured: Joe Harris, Chet Shepard, Michael Spradling

EMAdvantage

In an emergency, getting the right information to the right people in time to make the right decisions can save lives and property. A team from Pacific Northwest National Laboratory (PNNL) has developed an emergency management software system that accomplishes that goal. Emergency Management Advantage (EMAdvantage) is a software tool that simultaneously supports planning, daily operations, incident identification, emergency declaration, and emergency response activities for multiple users within an emergency operations center. Combining real-time modeling, visualization, and communications capabilities, EMAdvantage enables emergency managers to identify hazards, perform threat and risk analysis, declare emergencies, execute and track responses, register and reunite evacuees, and implement protective action decisions.

This technology has been transferred to Petroleos Mexicanos, which manages the national petroleum industry in Mexico; Aptec Microsystems, Inc.; NASA; and the U.S. Army. The transfer process involved software engineering, collaborative tools, copyrights, and licensing.

EMAdvantage is the only emergency management system that supports all phases of emergency management and makes the information available via desktop computer, the Internet, and personal digital assistants. Millions of people will be helped by this technology, although most may never be aware of its existence. Whether it is a natural disaster, an explosion, or a terrorist attack, EMAdvantage will provide invaluable assistance to emergency personnel and its use will save lives and property.

Contact: [W. David Millard](mailto:W.David.Millard@pnl.gov), (509) 375-2947,
Dave.Millard@pnl.gov

EMAdvantage Team



Left to right: Ken Harrington, Francisco Herrera, Dave Millard, Rene de la Mora, Alberto Vargas



*From left: David Millard, Blanche Wood,
Kelvin Soldat
Not pictured: Mark Goodwin*

Engine Exhaust Aftertreatment System Based on Non-thermal Plasma-Assisted Catalysis

A team at Pacific Northwest National Laboratory (PNNL), with the assistance of industry partners, developed an exhaust aftertreatment system for lean-burn diesel and gasoline engines based on non-thermal plasma (NTP)-assisted catalysis. This system converts harmful nitrous oxides and particulate matter emitted from vehicle engines into clean air components. The technology performs well in the lean-burn conditions of energy-efficient diesel engines, in which conventional three-way catalytic converters are inadequate. The exhaust aftertreatment system also could be easily incorporated into existing tailpipe designs, with little modification, as a retrofit option for older vehicles.

Through CRADAs, the PNNL team transferred the technology to numerous companies, including Ford Motor Company, General

Motors, DaimlerChrysler, Caterpillar, Inc., and Delphi Corporation. To date, a full-scale prototype of the system has been installed on a PSA Peugeot 206 environmental technologies demonstration vehicle.

There is a renewed interest in the U.S. reducing its dependence on foreign oil. To address this concern, the auto industry is developing more fuel-efficient and environmentally friendly cars and trucks. The exhaust aftertreatment system will enable these vehicles of the future to use more efficient diesel engines, and the fuel efficiency it will help make possible will directly reduce the amount of carbon dioxide emitted into the atmosphere.

Contact: [Darrell Herling, \(509\) 376-3892](tel:(509)376-3892),
Darrell.Herling@pnl.gov

Engine Exhaust Aftertreatment System Team



*Back row, from left: Monty Smith, Del Lessor, John Frye, Steve Barlow, Bob Silva,
Jud Virden, Gary Maupin*

Middle row: Russ Tonkyn, Charles Peden, Ken Rappe

Front row: Darrell Herling, Christopher Aardahl

Not pictured: Michael Spradling

Gun Shot Residue Kit

A team from Sandia National Laboratories (SNL), in collaboration with Law Enforcement Technologies (LET), has developed a field test kit that allows law enforcement officers to quickly test a shooting suspect for gunpowder residue. The Gun Shot Residue Kit uses a chemical detection technique that can identify minute traces of residue left at a crime scene—and on the shooter’s hands, arms, and clothing. Each kit includes a round fiberglass swab that can be rubbed on the suspected shooter. When the swab is soaked in a unique liquid chemical, spots where gunpowder residue are present will turn blue against the white swab. Producing results in less than five minutes, the kit can detect residues even if the suspect washed his hands after firing the gun.

The technology was conceived jointly between SNL and LET, with LET providing 100 percent of the financing. In addition, LET has licensed

the kit for commercial production and distribution. SNL provided additional product engineering to meet military and law enforcement community requirements by customizing the technology to meet its specific needs. Since its commercial introduction, the kit has received extremely positive acceptance from the law enforcement community, and inquiries have been received from several foreign companies regarding the use of the technology overseas.

Law enforcement and the military are the primary beneficiaries of the kit, as they now have a means of determining which people near the scene of a shooting may have been involved. Indirectly, the general public will benefit from a tool that allows a quick, effective method of identifying criminal elements.

Contact: [Philip Rodacy, \(505\) 844-1665, pjrodac@sandia.gov](mailto:pjrodac@sandia.gov)

Gun Shot Residue Kit Team



Left to right: Kevin McMahon, Pam Walker, Susan Bender, Phil Rodacy

Risk Assessment Methodologies

A team from Sandia National Laboratories (SNL) has developed risk assessment methodologies (RAM) for use in protecting America's infrastructure from potential terrorist threats. The methodologies identify risks and vulnerabilities, and then aid in design technology solutions to effectively manage the situation. This includes characterization of a facility; evaluation of consequences if the facility is attacked; definition of potential adversaries, their motives and resources; quantification of risk; detailed analysis of a facility's vulnerabilities; and a cost-benefit analysis of possible upgrade requirements.

Responding to an urgent need to get this technology out in a timely yet controlled fashion, the SNL team developed a unique licensing strategy. They not only directly

licensed interested parties, they also conducted "train the trainer" seminars at which leading consulting firms were not only trained and licensed to use and apply the technology, but also given the incentive to identify and qualify third-party sublicensees. To date, SNL has executed 80 licenses for RAM, and more are in process.

As a result of the SNL team's efforts, many infrastructure facilities have an increased awareness of potential vulnerabilities and are now taking steps to manage and mitigate risks. By taking these steps, the owners and operators of infrastructure facilities are helping to ensure that America and its citizens continue to prosper, even in uncertain times.

Contact: [Jeffrey Danneels](mailto:jjdanne@sandia.gov), (505) 284-3897,
jjdanne@sandia.gov

Risk Assessment Methodologies Team



*Left to right: Kevin McMahon, Linda McNeil, Bill Paulus, Betty Biringier,
Jeff Danneels, Teresa Torres*

Compressed Symbology for Direct Parts Marking

Each year, NASA must track millions of parts, even tiny electrical parts no larger than a dime. While the use of bar code labels has saved NASA millions of dollars annually, the labels did not work well on small parts. Compressed Symbology is a term that describes the marking of a permanent matrix bar code symbol directly on the surface of a part. The code can then be read with a charged couple device scanner similar to laser scanners in grocery stores. This two-dimensional symbol marking system, developed by Harry Schramm, addresses the inherent need in the aerospace industry for parts tracking.



Harry Schramm

The evolution of the technology is the result of partnerships with eight commercial partners, including CiMatrix and its parent company, Robotic Vision Systems, Inc. In the agreements, NASA provided parts and

materials, while its partners provided labor and expertise. To date, the technology has been successfully applied to more than 80 different materials, including metal, plastics, paper, fabric, and ceramics. The Compressed Symbology technology was inducted into the Space Foundation Hall of Fame in 2001.

The primary benefit of this technology is the elimination of paper bar code labels that fall off or cease to function. Because the marking is permanent, identification information can be read accurately for the life of a part. Compressed Symbology will ultimately have a broad customer

base in numerous industries, including automotives, aviation, and defense.

Contact: [Harry Schramm](#), (256) 544-0823,
fred.schramm@msfc.nasa.gov



EVALUATOR PANEL -
AWARDS FOR EXCELLENCE IN
TECHNOLOGY TRANSFER

Evaluator Panel

FLC Awards for Excellence in Technology Transfer

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

Dr. Tom Anyos, The Technology Group

C. Dan Brand, FLC Chair (1997-2001)

Joseph Culver, National Energy Technology
Laboratory

Dr. Lynn Davis, Research Triangle Institute

Dr. Margaret Filbert, U.S. Army Medical
Research Institute of Chemical Defense

Sue LeVan-Green, U.S. Forest Products
Laboratory

Al Lupinetti, William J. Hughes Technical
Center (retired)

J. Terry Lynch, National Institute of
Standards and Technology

Joan Miller, National Technology Transfer
Center

Dana Moran, National Renewable Energy
Laboratory

Dr. Kathleen Robertson, Naval Postgraduate
School

Patrick Rodriguez, Air Force Research
Laboratory

Ted Schoenborn, Schoenborn and Associates

A. David Spevack, Office of Naval Research

Herbert Spiegel, Applied Science &
Technology Associates

Thomas Squires, Associated Western
Universities, Inc.

Arthur Stephen, Westinghouse Savannah
River Company (retired)

Martha Steinbock, USDA, Agricultural
Research Service, Pacific West Area

David Swanson, Georgia Institute of Technology
(retired)

Tyrone Taylor, Unisphere



LABORATORY DIRECTOR OF THE YEAR

Laboratory Director of the Year

The FLC honors these Laboratory Directors who have made maximum contributions to the overall enhancement of technology transfer for economic development. Their accomplishments include support of FLC activities, internal efforts, industry involvement, and community service.



Dr. Thomas Barton

Department of Energy
Ames Laboratory

Joseph (Jim) Zarzycki

Department of Defense
U.S. Army
Edgewood Chemical Biological Center





FLC SERVICE AWARDS

FLC Service Awards

Harold Metcalf Award

Presented to an FLC Representative for sustained significant service to the FLC as an organization.

Winner: **Dr. Michael Sullivan**, Department of Defense, U.S. Navy, Naval Air Warfare Center Weapons Division, Point Mugu



FLC Representative of the Year

Presented to the FLC Representative who has made the most significant contribution to the FLC program in 2002.

Winner: **Lynn Murray**, Department of Transportation, John A. Volpe National Transportation Systems Center



Outstanding Service Award

Presented to an individual who is not an FLC Laboratory Representative or Alternate for a notable contribution to the FLC in terms of sustained support and/or service.

Winner: **Joan Miller**, National Technology Transfer Center





HONORABLE MENTION:
FLC AWARDS FOR EXCELLENCE IN
TECHNOLOGY TRANSFER

Honorable Mention

2003 FLC Awards for Excellence in Technology Transfer

The FLC also recognizes these laboratories for their contributions to technology transfer.

Department of Agriculture

Agricultural Research Service, Mid-South Area, “Commercial Scale Biological Control of Aflatoxin Contamination”

Agricultural Research Service, Mid-South Area, “Early Soybean Production System for the Midsouthern U.S.”

Agricultural Research Service, North Atlantic Area, Eastern Regional Research Center, Microbial Food Safety Research Unit, “Fluorescent Bacteria Used as Controls in Detection Protocols and for Monitoring Survival”

Agricultural Research Service, Northern Plains Agricultural Research Laboratory, “Dissemination of Effective, Affordable, and Sustainable Leafy Spurge Management Technologies”

Agricultural Research Service, Pacific West Area, Small Grains and Potato Germplasm Research Unit, “Development of the New Potato Varieties for the Pacific Northwest”

Agricultural Research Service, Pacific West Area, Water Management Research Laboratory, San Joaquin Valley Agricultural Sciences Center, “Environmentally Sound Application of Soil Fumigants through Drip Irrigation Systems”

Agricultural Research Service, South Atlantic Area, Imported Fire Ant and Household Insects Research Unit, “Fire Ant Decapitating Flies”

Agricultural Research Service, South Atlantic Area, National Peanut Research Laboratory, “FarmSuite: An Expert System for Peanut Production Management”

Agricultural Research Service, South Atlantic Area, Southeastern Fruit and Tree Nut Research Laboratory, “Guardian™ (BY520-9) Peach Rootstock”

U.S. National Arboretum, Gardens Unit, “Landscape Integrated Pest Management”

Harry K. Dupree Stuttgart National Aquaculture Research Center, “Control of Snails that Vector Diseases to Farm-Raised Fish”

Hydrology and Remote Sensing Laboratory, “A Real Time Assessment System for Spring Wheat Production in Siberia”

National Center for Agricultural Utilization Research, New Crops Research, “Biodegradable Lubricants and Hydraulic Fluids from Renewable Resources”

Animal and Natural Resources Institute, Parasite Biology, Epidemiology and Systematics Laboratory, “Development of Guidelines to Prevent Toxoplasmosis, Neosporosis, and Sarcocytosis”

Department of Commerce

National Institute of Standards and Technology, “Irradiation Applications for Bioterror Mitigation”

National Institute of Standards and Technology, “Reference Sample Chip Carrier”

National Institute of Standards and Technology, “Transfer to the Semiconductor Industry of Materials Processing Technology”

Department of Defense—U.S. Army

Edgewood Chemical Biological Center, “A Self Contained, Portable and Disposable Biological Sampling Kit (BISKit)”

U.S. Army Tank Automotive and Armaments Command, Armament Research Development and Engineering Center (TACOM-RDEC), “X-ray Imaging Using Ultra-Fast Energy Discrimination, Photon Counting Detectors”

Department of Defense—U.S. Navy

Naval Research Laboratory, “InfraLynx: A Rapidly Deployable Interoperable Communications Infrastructure”

Naval Undersea Warfare Center Division Newport, “Bayesian Data Reduction Algorithm”

Naval Undersea Warfare Center Division Newport, “Cost Effective Silencing Upgrade Kits for MK 48 Torpedoes”

Naval Undersea Warfare Center Division Newport, “Non-Linear Signal Processing for Diagnosis of Sleep Breathing Disorders”

Department of Defense—U.S. Air Force

Air Force Research Laboratory, Materials and Manufacturing Directorate, “Vein Viewer: Technology for Direct Visual Identification of Subcutaneous Structures”

Air Force Research Laboratory, Sensors Directorate, “Lufthansa Offers In-flight Internet Access Using Boeing/AFRL Antenna”

Department of Energy

Ames Laboratory, “Ultra-Pure and Specialized Metals, Alloys, and Ceramics, and Processing Techniques”

Argonne National Laboratory, “Fast Track Commercialization of ¹²⁵Implant Seeds for Treating Prostate Cancer”

Lawrence Berkeley National Laboratory, “Air Pollution Measurement Methods for Heavy Oil Storage Tanks”

Lawrence Berkeley National Laboratory, “Gas Filled Panels”

Lawrence Livermore National Laboratory, “Field Portable Kits for Solid-Phase Micro-Extraction Technology”

Lawrence Livermore National Laboratory, “Field Portable Thin-Layer Chromatography”

Lawrence Livermore National Laboratory, “Network Intrusion Detector: A System for Safeguarding Network Security”

National Renewable Energy Laboratory, “The National Renewable Energy Laboratory’s Enterprise Development Program”

National Energy Technology Laboratory, “Web-Based Distribution of Open-Source Multiphase CFD Software”

Pacific Northwest National Laboratory, “Decision Support for Operations and Maintenance”

Department of Health and Human Services

National Institute for Occupational Safety and Health, “Automatically Deploying Roll-Over Protection System (AutoROPS)”

NASA

Goddard Space Flight Center, “AutoCon-f-Autonomous Maneuver Control Flight Software”

Goddard Space Flight Center, “Capacitive Reflector (Capaciflector)”

Marshall Space Flight Center, “Auto-Adjustable Pin Toll for Friction Stir Welding”

Marshall Space Flight Center, “Generalized Fluid Systems Simulation Program”

Marshall Space Flight Center, “High Strength and Wear-Resistant Aluminum Alloy (MSFC-388 & MSFC-398)”



HONORABLE MENTION:

FLC LABORATORY DIRECTOR OF THE YEAR

FLC SERVICE AWARDS

Honorable Mention

FLC Laboratory Director of the Year Award

The FLC recognizes these nominees for their commitment to technology transfer activities within their laboratories.

Alan Janiszewski

Department of Defense
Air Force Research Laboratory,
Propulsion Directorate

Arthur Stephenson

NASA
George C. Marshall Space Flight Center

FLC Service Awards

The FLC recognizes these nominees for their longstanding service and support.

Representative of the Year Award

Dr. J. Scott Deiter
Department of Defense
Naval Surface Warfare Center, Indian Head Division

Outstanding Service Award

A. David Spevack
Department of Defense
Office of Naval Research

FLC National Meeting
May 5-9, 2003
Tucson, Arizona

