APPENDIX E

FY 2002 Federal Laboratory Consortium Awards to the Department of Defense

FY 2002 FLC Awards to the Department of Defense

2002 Laboratory Director of the Year: Brian Simmons

Brian Simmons is both the Technical Director of the U.S. Army Developmental Test Command (DTC) and the Chair for the Aberdeen Proving Ground (APG) Science and Technology (S&T) Board. Within the DTC, he has established a full-time ORTA position that interacts on a weekly basis with the FLC Mid-Atlantic Regional Representative on a wide variety of technology transfer issues affecting APG.

As APG S&T Chair, Simmons established a High Technology subcommittee to focus on a number of technologies including biotechnology, nanomaterials, environmental, automotive and robotics, and firefighting technologies. He also established a Higher Education Subcommittee to focus on educational issues, and a Marketing and Publicity subcommittee to ensure that APG is recognized in the media. These subcommittees have played very active roles in support of technology related events on the proving ground and for shaping the growth of technology transfer activities.

Under the direction of Simmons, the APG established the Team APG Business Development Office (BDO). This office serves as the single point of contact for the business community to access APG. To date, the BDO has generated many CRADAs and is recognized by the business, government and academic community as a vital resource for future development plans.

Simmons has played an active role in the Harford County and Army Alliance Science and Math Magnet School initiative at Aberdeen High School. The DTC hosts two teachers as part of a summer teacher intern program. The purpose of these ventures is to impart knowledge of the APG to the school system and to permit the use of laboratory facilities to teachers and students.

The activities sponsored by the BDO have served to bridge gaps and enhance industry outreach for the combined benefit of APG and the private sector. Two major outreach activities for industry were held at APG under Simmons' leadership. The first, a Biotechnology Showcase, resulted in 135 industry attendees from a four-state region. The second, a two-day Technology Showcase, resulted in over 200 attendees representing industry, academia, local and state government as well as Federal officials and members of Congress.

Among Simmons' other technology transfer accomplishments is forging alliances with Maryland economic organizations including the Technology Development Corporation, Maryland Department of Business and Economic Development, and the four-state Mid-Atlantic Research Consortium. And under his direction, the APG S&T Board and the Ben Franklin Technology Partners of Pennsylvania signed a Memorandum of Agreement to commence a cooperative relationship between the two entities.

U.S. Army

The Biological Detection Kit

Seated: Dorothea Paterno; Standing, from left: Dr. Peter Stopa, Maurice Milton, Philip Coon, Alan Seitzinger, James Genovese; not pictured: Darlene Tieman.

Increased awareness of the potential use of biological agents as weapons of terror and mass destruction underscores the importance of finding a means to sample and detect agents in a rapid and effective manner. The Biological Detection Kit (BDK) consists of sampling and detection equipment for biological agents including large area surfaces, small solid samples, liquid samples, and air samples. The kit is integrated into a single package that can analyze samples for the presence of DNA, protein, and bacteria. The BDK takes techniques borrowed from food safety, personal air monitoring and other arenas, and integrates them with new approaches to create a technology that can be very easily used in the field.

The technology transfer effort from the BDK team took several forms. A cooperative research and development agreement (CRADA) was established with New Horizons Diagnostics, Inc. to package the kit. EAI Corporation served as another CRADA partner to further refine and market the BDK. Other vendors,

including Turner Designs, Inc., Molecular Probes, Inc.; and Chemmetrics, Inc. are providing the BDK team with supplies, reagents and specialized expertise. In addition, an Information Exchange Agreement was established with the Military Institute of Hygiene and Epidemiology in Poland that enabled joint development of the spore luminescence protocol of the kit.

The effort behind the BDK has resulted in the development of the BioHaz™, a system that provides users with the capability to sample and detect biological materials in suspect samples. This product is currently being marketed by the response Equipment Corporation, a subsidiary of EAI Corporation. The kit is also being marketed as the SWIPE™ sampling and spore luminescence kit by New Horizons Diagnostics, Inc. This technology has been used by Hazmat teams in several cities, including Washington, DC and Virginia Beach, Virginia, in response to recent incidents involving anthrax.

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Edgewood Chemical Biological Center

Integrated Virus Detection System

Dr. Charles Wick

The Integrated Virus Detection System (IVDS) represents a fundamentally new method for detecting and identifying viruses and nanoparticles. Capitalizing upon the physical properties of size and density allows viruses to be counted and identified without the use of biochemical reactions. Dr. Charles Wick invented and developed the IVDS and transferred the technology to Virus Detection Company, LLC (VSDC) through an exclusive license. Analysis and identification through the use of the patented IVDS has led to a wide range of new discoveries including the ability of some viruses to pass through filters, change easily, live a long time under harsh environments, and live in soil and water. Recent outbreaks such as the West Nile virus, other alphaviruses, influenza and Foot in Mouth disease make this technology extremely useful and timely. The IVDS technology transfer effort is producing tangible results in terms of the creation of capital and jobs within the U.S. through the creation of VSDC. Several industries will benefit directly from the development of the IVDS. The bioprocessing industry will be able to use this technology to develop new products including vaccines, as well as expanding into new regions of science and technology. Materials technology will use IVDS to refine its nanoparticle based creations that can have applications in a number of areas, including paints, coatings, and transparent films used as computer monitors and television screens. The computer industry will be able to produce

newer and more complex computing devices with improved nanometer sized separations and tolerances. Lastly, the IVDS has provided a new standard of measurement on the nanometer scale that relies upon such instruments as electronmicrography and light scattering.

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U.S. Navy

Plasma Arc Waste Destruction System

Jon Cofield

For almost a decade, researchers at the Carderock Division, Naval Surface Warfare Center have been investigating plasma arc technology as a method to destroy shipboard combustible solid waste. Dr. Eugene Nolting and Jon Cofield developed the Plasma Arc Waste Destruction System (PAWDS), which offers a small size, rapid and efficient operation, and the ability to incinerate a wide variety of garbage. Forming an electric arc in a gas—a process that generates temperatures hotter than the sun's surface ----

Dr. Eugene Nolting

creates the plasma used in the system. This allows operation at such an extremely high temperature that combusting materials release very few pollutants to the environment. The team was able to move this patented technology forward through both a Cooperative Research and Development Agreement (CRADA) and a licensing agreement with PyroGenesis, Inc., a privately owned company that develops and commercializes customized thermal plasma technologies. PyroGenesis plans to manufacture and install PAWDS on commercial cruise liners The primary beneficiary of PAWDS is the cruise industry, which is subject to stringent pollution control regulations. International law prohibits ships from indiscriminately dumping trash at sea, so much of the waste must be burned in conventional incinerators or stored for later removal. Because the incinerators cannot burn plastic, the garbage is spread out on a table and hand sorted. PAWDS eliminates the need to hand sort garbage and store contaminated plastic. Not only are labor costs lowered by the use of PAWDS, but its smaller size results in additional room, which often is used as cabin space by paying customers. Because ships have limited space, this benefit is very important. In addition, the technology produces a waste gas stream that is so clean it can be operated during the daytime without impacting passengers' quality of life.

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Carderock Division, Naval Surface Warfare Center

Advanced Nontoxic Fouling Release Coatings

Dr. Joanne Jones-Meehan

Dr. Joanne Jones-Meehan of the Naval Research Laboratory (NRL) has worked to develop and commercialize an environmentally safe coating system for ship hulls and pipeline applications, such as power plant water intakes. This patented coating system reduces the problem of biofouling (the undesired growth of barnacles, mussels, algae, etc.) without the use of toxic metals and biocides. Rather the coating provides a surface to which organisms find it difficult to adhere. There is a pressing need for an environmentally safe method for controlling biofouling to replace current methods that involve metals and other chemicals that are potentially harmful to aquatic life and workers alike.

Smart Surfaces, LLC of Annapolis, Maryland entered into a licensing agreement with NRL to bring Dr. Meehan-Jones' technology to the marketplace. Also during the technology transfer process, Dr. Jones-Meehan was involved with testing the product on 10 ships and at three power plants, as well as application and inspection of the test coatings.

The coating system, as licensed by Smart Surfaces, will be used on commercial, private and Government owned ships, as well as on power plant water intake systems. Benefits will be realized in a number of areas as workers will be no longer be exposed to potentially harmful chemicals of antifouling paints; the electric power generating industry will save up to $5 billion a year by avoiding water intake cleanup; and the aquaculture and fishing industries will see a significant reduction in the number of lost lines, nets and other equipment from biofouling.

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High Speed, Ultrastable, Fiber-Optic Communications Laser

Dr. Thomas Carruthers

Irl Duling

Michael Dennis

A team at the Naval Research Laboratory (NRL) has developed and advanced fiber-optic laser that is capable of generating ultrashort pulses of light. Because pulsed laser light is used to carry digital information, the ultrastable, ultrafast NRL fiber laser technology enables—among other things—development of next-generation communications systems. In addition, this patented technology can be used for radar systems and for other applications such as navigation and surveillance.

The team has been successful in transferring the laser by establishing licensing partnerships with two companies, PriTel, Inc. and Calmar Optcom. The primary results of the technology transfer efforts are the numerous products that are being manufactured and sold under the NRL licensing agreements. To date four models of optical clocks, three optical transmitters, and two high power polarization maintaining fiber amplifiers are on the market.

Advances in communication via telephone, local networks or the Internet via this technology will benefit any business or activity that relies on exchange of information, including banks and financial service providers, hospitals, government agencies, distance education programs, and the military.

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Naval Research Laboratory

Digital Image Enhancement

Michael Duarte

A sailor trying to find mines in a cluttered underwater environment faces the same challenges as a physician looking for microcalcifications in a mammogram of dense beast tissue. Both of these searches can benefit from digital image enhancement. Michael Duarte of the Naval Undersea Warfare Center (NUWC) Division, Newport developed a digital image enhancement technology which uses wavelets and mathematical functions, which serve as building blocks to represent data. Applying the digital image enhancement allows small objects to be found in a large, complex area. This patented technology as applied to breast cancer screening would improve the physician's ability to detect microcalcifications on a mammogram, thus catching the cancer at an earlier stage than previously possible. The early detection would improve the patient's chance of survival and allow less invasive treatment options.

James Kasischke

Duarte, a digital signal processing expert, noted the similarities between underwater mine-hunting sonar and the problems of detecting small lesions in mammograms. Under Dual Use funding, he began working on mammogram digital image enhancement, using NUWC's state-of-the-art technical facilities. Duarte then worked with James Kasischke, a NUWC patent attorney, to identify business and patent opportunities that led to cooperative research and development agreements (CRADAs) with Advanced Image Enhancement, Inc. (AIE); and the Slater Center for Interactive Technologies. A licensing agreement has also been established with AIE.

Thanks to Duarte, the Navy has successfully transferred undersea mine-hunting technology to the medical community. Digital Image Enhancement will enable doctors to have greater success in detecting early stage breast cancer. Women will benefit from the early detection, resulting in the saving of thousands of lives.

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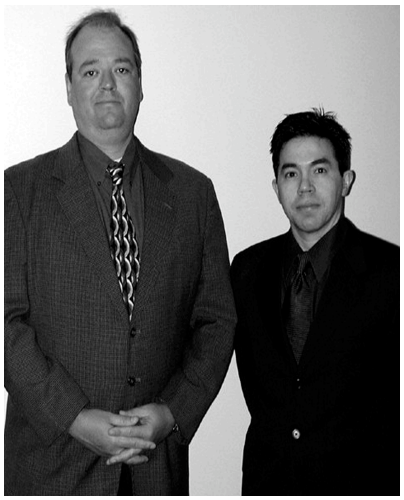
U.S. Air Force

Lightweight, Carbon Composite Cages for Low-Heat Generation Bearings



Dr. Nelson Forester and Lewis Rosado

Wei Shih

A team at the Air Force Research Laboratory/Propulsion Directorate (AFRL/PR) developed a composite cage for rolling element bearings. The lightweight, carbon-carbon (C-C) and carbon-phenolic (C-Ph) composite cages enable rolling element bearings to operate at a higher speed with significantly less frictional heat generation than bearings fitted with traditional steel and cotton-based phenolic cages. This technology has proven to be helpful in solving critical heat generation problems in advanced demonstrator engines for cruise missile applications.

The partner of the AFRL/PR team in this technology transfer effort is Allcomp, Inc. Their arrangement took the forms of an exclusive patent licensing agreement and a cooperative research and development agreement (CRADA). Allcomp was responsible for manufacturing the composite bearing cages; AFRL/PR handled the cage/design specifications, conducted validation testing, and transitioned the technology to military programs.

Beneficiaries of the composite bearing cage technology include domestic bearing manufacturers, as well as users of rotating equipment and turbomachinery. Uses subject to extreme operating conditions and poor marginal lubrication conditions will find the composite cages of great value. Specific examples include aircraft and power generation gas turbine engines, automotive turbochargers, machine tool spindles, medical X-ray machines, and rotating devices in satellites.

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FLC Outstanding Service Award – Mary Weiss

Through her years of involvement with the FLC, Mary Weiss has made a significant impact on this organization though her extensive knowledge of technology transfer and her tireless commitment to promote the Consortium's mission.

Ms. Weiss has spent the last 10 years working in the Department of Defense (DoD) technology transfer arena. Since 1998, she has been involved with the Office of Research and Technology Applications for the Defense Technical Information Center (DTIC). In this capacity Ms. Weiss has assisted in the preparation of the DoD's annual report to Congress on technology transfer. In supporting that effort and technology transfer in the DoD, she helped define the requirements and plan for implementation of the Defense Technology Transfer Information System (DTTIS). In response to the needs expressed by many small companies Ms. Weiss has helped them understand how to use the government's scientific information assets as part of DTIC's technology transfer mission.

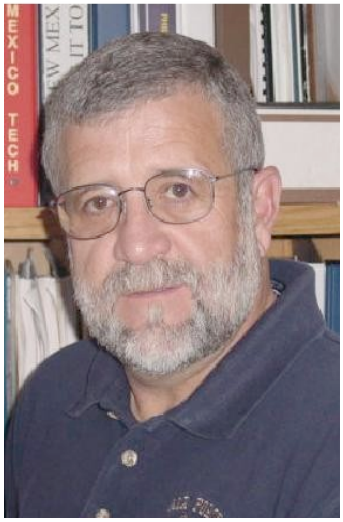
The commitment to the FLC that Ms. Weiss has demonstrated stems from her belief that the FLC is an important gateway for information and cooperation for both the laboratories and the public. She was instrumental in the completion of the FLC's Federal Technology Transfer Legislation and Policy, also known as The Green Book. Ms. Weiss conducted extensive research on public domain material for inclusion in the book. The end result of her work in this area resulted in the development of an updatable professional index. She was also responsible for coordinating the review of a draft version of the Green Book with FLC members.

In another FLC project Ms. Weiss worked with DTIC and the National Institute of Standards and Technology (NIST) to compile data and compose letters to be sent to federal laboratories about contributions they could make to advance the technology transfer effort.

Ms. Weiss has also held several positions in the FLC, including Alternate Laboratory Representative for DTIC as well as Member-at-Large. She is also a member of the Marketing Committee, where she is involved in the revamp of the FLC web site's design and content.

Ms. Weiss has proven to be a valuable asset to the FLC and should be considered for the 2002 Outstanding Service Award.

FLC Representative of the Year Award – Patrick Rodriguez



Mr. Rodriguez has been an FLC member for over 18 years. He has been Regional Coordinator for the Mid Continent Region, Chair of the State and local Government Committee, and has participated in the Awards and Training Program, and Marketing Committees. Mr. Rodriguez was the first full-time ORTA within the Air Force and is now the alternate lab representative for the Air Force Research Laboratory (AFRL) – Directed Energy Directorate at the Phillips Research Site.

Mr. Rodriguez has created and championed the Tech Transfer for Education (TTE) Program as a priority activity within the Air Force Tech Transfer Program. Mr. Rodriguez was responsible for building the AFRL at KAFB TTE Program. In 1992, five schools from the Albuquerque area were involved in two education outreach projects sponsored by Phillips Laboratory (now the AFRL at KAFB). Mr. Rodriguez took over the leadership for the education outreach projects in 1994. Under his supervision, the AFRL at KAFB TTE Program has grown to six K-12 projects that currently involve 140 schools and have had over 49,000 students participate to date through the State of New Mexico. These projects utilize the expertise of mentors from the AFRL and at least 23 other organizations such as Sandia National Laboratory, Space Missile System Center, Aerospace Corporation and Unisys. Currently 62 of the schools involved in the AFRL at KAFB TTE Program are from rural communities.

As the Program Manager for the AFRL at KAFB TTE Program, Mr. Rodriguez was involved with the implementation of the first Educational Partnership Agreement (EPA) within the Department of Defense (DoD) to donate computers to schools. Donations of equipment to educational institutions under the Technology Transfer Act, 15 USC 3710(i) have been a key component of the education partnering activities for the AFRL at KAFB.

One of the teams involved in the SPACE Project from Albuquerque Public Schools, Eldorado High School, received an official patent, #6409564, in August of 2000 for their project development of an electromagnetic sliding satellite door. The team, which included 7 students, their teacher and 2 mentors, also received national recognition for their project. The SPACE team from Manzano High School, which was a joint project, placed second in the 1999-2000 Adventures in Supercomputing Competition sponsored by Sandia National Laboratories. Another SPACE team from Bernalillo Public Schools won first place in the paper competition for their 1999-2000 SPACE Final Report. Students participating in the March 2000 Mars Missions Link-Up Day were featured on the Kids Network, a national cable channel.