



Maryland Technology Transfer Offices Partnership Newsletter

University of Maryland College Park • The Johns Hopkins University • University of Maryland Baltimore County
University of Maryland Baltimore • Morgan State University • University of Maryland Biotechnology Institute
The Johns Hopkins University/Applied Physics Lab

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INTRODUCTION

The 11th issue of MDTTO focuses on the successes and triumphs members of the Maryland Technology Transfer Offices partnership have had in recent months. It's meant to serve as a pat on the back, and to remind us that hard work can pay off.

FEATURES

OTC Invention of the Year Award winners named

The development of a new kind of software with applications for video surveillance, health care monitoring and animation, the discovery of an organism for use in bioethanol production, and the creation of a method for making artificial micro machines are the winners of the University of Maryland's 20th Annual Invention of the Year Awards, presented on April 19 by the University's Office of Technology Commercialization.

The winners were announced at an afternoon reception, which was attended by more than 120 members of the university and business communities at the University of Maryland Golf Course. The reception honored inventors who disclosed new technologies to the university in 2006.

The awards are presented annually to honor outstanding inventions and inventors from the previous year. Each year, an independent panel of judges made up of University of Maryland personnel and industry experts select the winners from groups of finalists in three categories: information science, life science and physical science. The winners were chosen based on the creativity, novelty and potential benefit to society of their inventions.

The Office of Technology Commercialization (OTC) at the University of Maryland was established in 1986 to facilitate the transfer of information, life and physical science inventions developed at the university to business and industry. In the past 20 years, the University of Maryland's Office of Technology Commercialization has: recorded more than 1,660 invention



University of Maryland inventor Aravind Sundaresan, third from left, receives his Invention of the Year award from Melvin Bernstein, vice president of the Division of Research, OTC Executive Director James Poulos, III and University President C.D. Mote, Jr.



University Inventor Steven W. Hutcheson, second from left, receives an Invention of the Year Award at the OTC banquet.

disclosures; secured more than 300 U.S. patents; licensed more than 785 technologies to business; signed more than 600 license agreements; generated more than \$25.4 million in technology transfer income; and assisted in the creation of more than 50 high-tech start-up companies founded on the basis of technologies developed at the university. Of the 32 start-up companies founded in the last five fiscal years (FY 2002-FY 2006). Twenty-six are located in Maryland.

This year's winners were:

Markerless Motion Capture, by Aravind Sundaresan and Ramalingam Chellappa (Information Science)

Enzyme Systems for Saccharification of Plant Cell Wall Polysaccharides by a Marine Bacterium to Release Fermentable Sugars, by Steven W. Hutcheson and Ronald M. Weiner (Life Science)

Method for Fabrication of Complex 3-D Microfluidic Networks, by John T. Fourkas and Christopher N. LaFratta (Physical Science)

The runners up were:

OASYS Version 1.0, by Venkatramanan Siva Subrahmanian, Diego Recupero Reforgiato, Antonio Picariello, Bonnie J. Dorr, Carmine Cesarano and Amelia Sagoff (Information Science)

Saliency-Guided Visual Enhancement, by Amitabh Varshney and Youngmin Kim (Information Science)

A Guard Cell-Specific Tool for Molecular Manipulation of Drought Tolerance/Water Loss in Plants, by Heven Sze, Senthilkumar Padmanaban and June Kwak (Life



Michael P. Doyle, chair of the university's Department of Chemistry and Biochemistry, accepts an Invention of the Year Award on behalf of John T. Fourkas and Christopher N. LaFratta.

Science)

Genetic Polymorphisms Associated with Body Fat, by Tom E. Porter and Michael Muchow (Life Science)

Integrating Sensor Monitoring the Allowable Heat Exposure Time for Firefighters, by Marino diMarzo and Amr M. Baz (Physical Science)

Transient Liquid Phase High Temperature Solder Paste Attach, by F. Patrick McCluskey and Pedro Quintero (Physical Science)

JHUAPL honors Inventions of the Year

A device to detect and stop electrical fires, a DNA-sensor for spotting dangerous pathogens and a method for making flexible microelectronics were announced tonight as the Johns Hopkins University Applied Physics Laboratory's (APL) Inventions of the Year. The annual awards event, held on the APL campus in Laurel, Md., showcased technologies submitted in 2006 that were developed by APL staff members.

Last calendar year, 190 APL inventors reported 125 inventions to APL's Office of Technology Transfer. From this group, an independent panel of 25 representatives from industry and patent law selected three top inventions based on their benefit to society, improvement over existing technology, and commercial potential. APL Technology Transfer Director Kristin Gray presented plaques and cash awards to the winning inventors, listed with their inventions below:

Portable Arc Flash Protection System: APL researcher Bruce Land has designed a portable system to detect and stop electrical fires caused by "arcing." An arc fault is a short circuit that travels through the air between electrical conductors; an

arc flash is the superheated blast of hot air and plasma that occurs when the arc strikes the conductors – and can lead to severe burns and other injuries. The APL system helps protect people working on “live” electrical systems from arc flashes, a critical need when severe arc flash injuries send about 2,000 workers a year to burn centers. The APL-developed arc flash detectors and a small control box mount on a stand, giving the sensors a clear view of the energized equipment. If an arc flash occurs, the control box would send a signal to a local or remote upstream breaker that cuts the flow of current to the flash, reducing damage and injury. The sensors and transmitters are also small enough to be attached to the operator’s clothing.

Nanoporous Nucleic Acid Sensor: Stergios Papadakis has devised an electronic DNA-sensing method that could make it easier and more efficient to detect bacteria such as *Bacillus anthracis* – the dangerous pathogen that causes anthrax. The APL method flows DNA molecules in a solution through microscopic pores in a nucleic acid sensor; the target DNA binds with complementary “probe” nucleic material located in these pores, which could be as small (if not smaller) than the width of a human hair. An electronic sensor then measures the conductivity changes in the DNA after it binds with the probe materials, allowing the system to quickly identify its source. The system, still in testing, requires none of the fluorescent dyes or optical readout equipment found in similar technologies. Its designers aim to make it small, robust and portable.

Advanced Thin Flexible Microelectronic Assemblies: Harry Charles, Charles Banda, Arthur Francomacaro, Allen Keeney and Seppo Lehtonen are being honored for their method of making flexible microelectronics, including a new process for multi-layer, thin-film substrates that are thinner and have a higher interconnect density than today’s commercially available materials. Their work focuses on achieving maximum flexibility and thinness through overall system assembly and a novel method of die thinning — for die as thin as a single micron (about 50 times thinner than even the thinnest human hair). Flexible electronics offer advantages in their ruggedness, light weight, compact size and low power consumption. Their many potential uses include smart cards, active circuit appliquéés and highly miniaturized and implantable biomedical devices.

This year’s ceremony also included presentations of the Lab’s first Master Inventor Awards, honoring staff members (past and present) who hold at least 10 U.S. patents for their APL work. Nine of the awardees are current Lab employees, seven are retired and five are deceased. For deceased awardees, family members were invited to accept the awards on their behalf. The inaugural Master Inventors are Joseph Abita (retired), Paul Biermann, Bliss Carkhuff, Harry Charles Jr., Timothy Cornish, Robert Fischell (retired), Harvey Ko, Sverre Kongelbeck (retired-deceased), Jerry Krill, John Kuck (retired-deceased), Roger Lapp (retired-deceased), John Murphy (retired), George Murray, Carl Nelson, Eugene Nooker (retired), Richard Potember, David Rabenhorst (retired), Woodrow Seamone (retired), Charles Swet (retired), Gilbert Wilkes II (retired-deceased) and Theodore Wyatt (retired-deceased).

Opinion analysis program leads to new start-up company

With a University of Maryland College Park technology spurring the idea, a group of local businessmen and scientists have launched a new company that measures a tough to quantify concept – worldwide opinion.

SentiMetrix, of Bethesda, Md., was launched in fall 2006 by university professor V.S. Subrahmanian, graduate student Diego Reforgiato, and two businessmen who spent time with online giant AOL LLC, Vadim Kagan and Michael Rozenman.

The company is based on Subrahmanian’s Opinion Analysis SYStem, commonly known as OASYS. It was developed at the University of Maryland Institute for Advanced Computer Studies, and is based on a series of complex algorithms.

“Recent surveys show that the marketing research market, including opinion research and brand monitoring, is growing rapidly, as new technologies get applied to electronic media, both professionally and consumer generated media,” Rozenman said. “We have started SentiMetrix because we believe that the OASYS technology is the best response to what these markets need today: sentiment tracking in multi-lingual data, done in a timely, cost-effective way.”

OASYS, which was a finalist for the OTC Invention of the Year Award, is capable of tracking the media on the Internet in many languages, measuring the intensity of sentiment expressed on a variety of subjects. For this reason, it is unique, the businessmen say: most programs detect just “polarity” on a subject (like/don’t like, for example), and most are not multi-lingual.

So far, the founders said they intend to build “an extensive data collection operation” for traditional and consumer-generated media, including mainstream news, blogs and message boards, starting first with English-language sources. They will then move on to other languages, starting with the most frequented Web sites.



V.S. Subrahmanian

A SentiMetrix customer will use OASYS through a controlled access Web site, with a search engine-like interface available to run queries. A visual representation and quantitative data is available, and a free Web site with limited options will be developed as a market tool, Rozenman said.

Thus far, OASYS has won Computerworld Magazine's 2006 Horizon Award, which goes to the most innovative pre-commercial technology.

UMBI start-up making headway, securing funds

A University of Maryland Biotechnology Institute start-up company announced in January 2006 has continued to grow, securing MIPS funding and an SBIR award in the last year.

Potomac Affinity Proteins, LLC. (PAP), previously reported in MDTTO in January 2006, was started by Dr. Philip Bryan, a member of the CARB faculty. Developing rapid, inexpensive and robust affinity purification technology based on the specific interaction between subtilisin and its cognate prodomain, PAP's technology allows for efficient purification of a target protein.

The funds that PAP has secured are being used to create an integrated system for the expression, detection and rapid purification of proteins from cloned genes. Building on their subtilisin::subtilisin prodomain (protag) process, the money is being used to further engineer the binding molecule for affinity purification of protagged fusion proteins and as well as the processing protease for protag removal.

The long range objective is to develop a sophisticated set of tools to facilitate proteomic analysis in the way restriction endonucleases have been used to facilitate genomic analysis.

PROFILES

OTC's Poulos found technology transfer after an unexpected fork in the road

For 15 years, James A. Poulos, III worked as a lawyer in private law firms, practicing patent law for hundreds of clients.

One of his favorite clients, though, was the University of Maryland's Office of Technology Liaison, a predecessor of today's Office of Technology of Commercialization.

"Whenever I visited or spoke with the folks at OTL, they genuinely appeared happy," Poulos said. "I thought that may be a good place to work one day."

That day came a lot sooner than Poulos expected, however. In March 1998, he was hired as an associate director at OTC and then became executive director in July 1999, opening up what he calls a "whole new world" where every day is different. Poulos said that world has continued to evolve, producing a climate where technology is more interdisciplinary now than ever before.

"Technology happens at a faster pace today than even 10 years ago," Poulos said. "It is more complex, more systems-driven, and the lines between the technology fields are more blurred. A computer scientist is likely to be coding programs for biological systems, and a biologist is likely to be considering a more efficient bioreactor to produce synfuels."

Poulos says his attraction to tech transfer "is more related to an expectation of something new than tech transfer per se: a new technology, a new legal issue, a new inventor, a newly discovered company to market technology to, a new license agreement, a new office challenge..."

OTC has recorded six new start-up companies in fiscal 2007, and brought in a record \$1,873,000 in license, option and royalty income in fiscal 2006. Noting that "if you're not moving forward, you are not growing," Poulos said he would like to see the office top the number of license agreements it signed in fiscal 2006, spur the development of more start-up companies and bring in record income for a second year in a row.

Poulos said the office does have challenges that it must face, but does not feel they are unique to OTC.

"Small budgets and human resources are the challenges of most tech transfer offices in the Maryland System and around the country," Poulos said. "These challenges are as old as the office itself (20 years). The creation of database tools, including a database of over 3,000 small- to medium-sized companies helps us in marketing UMD technology. I think this is unique to



James. A Poulos, III

College Park. Other databases created and improved by OTC help track deadlines, patent applications, royalties due. These databases have been licensed to two medical schools and a private university. Everyone on staff is geared to streamlining processes. We diligently pursue marketing and licensing leads. Having recently returned to campus, we have been able to hire talented graduate students to assist in technology analysis and marketing and public relations.”

In his spare time, Poulos enjoys spending time on thoroughbred horse farms, and considers horse ownership an extension of his job here at Maryland.

“They’re beautiful animals,” Poulos said. “As Jane Smiley wrote on the death of Barbaro: ‘... Thoroughbreds have been bred to press on and prevail where other breeds of horse throw in the towel.’ ... I actually consider the thoroughbred a metaphor for OTC, because we never give up.”

Editor’s note: After nine years at OTC, Jim Poulos will be leaving the office to become the director of technology transfer at the Maryland Technology Development Corp (TEDCO).

JHUAPL’s Gray steps in for role as director

After 15 years in technology commercialization, Kristin Gray, director of the Office of Technology Transfer at the Johns Hopkins University Applied Physics Laboratory, said her goals for her office are not unique.

But Gray, who was named director of the office in November, said there have been many changes in the field that have made creativity essential to the job.

“I’ve seen the field of technology transfer grow exponentially since I first got involved in 1991,” Gray said. “Nearly all research universities have a technology transfer program and most faculty know about how to protect their great intellectual property.”

Gray said the global changes in the marketplace have led to technology transfer offices spending more time developing relationships and forging partnerships with outside companies.

“Creativity and flexibility give us all the tools we need to make the best arrangement for our technologies,” Gray said.



Kristin Gray

Gray is part of the original team that helped now-retired director Wayne Swann establish the office in 1999. Since that time, APL’s Office of Technology Transfer has registered 906 inventions disclosed as of the end of fiscal 2006, with 179 U.S. patents issued, 1,120 patent applications filed, 175 license agreements executed, 16 new companies created and \$26 million in licensing and related income.

Gray said she looks forward to building on the foundation that Swann laid.

“APL has a wealth of quality technologies in a broad spectrum of physical and information science disciplines,” Gray said. “Our office helps APL staff transfer technologies developed here to business and industry to benefit the public, foster economic development, and benefit the Johns Hopkins University.”

Gray said the biggest challenge her office faces is dealing with the sheer volume of technologies which cross over their desks each week. “It sometimes feels like we have more good technology than we can handle,” she said.

Gray said she enjoys working in technology transfer because it offers daily challenges and insight into “all of the wonderful new technologies coming through the office.

“I enjoy working both with the inventors and the companies to make the right connections,” she said. “When it works, it’s very satisfying, and there’s never a dull moment.”

Before taking over for Swann, Gray worked at APL as assistant director for technology transfer. Before joining APL, she worked in the University of Maryland’s Office of Technology Commercialization. At OTC, Gray worked first primarily with technologies in information science, then branched out to cover some physical and life science technologies, as well. She was in charge of the marketing efforts at OTC when she moved to JHUAPL.

Gray holds a bachelor’s degree in sociology-based human relations. She lives in Kensington, Md., with her husband, Jeff.

CALENDAR

- May 2 The Annual Tech Awards Celebration
 Hosted by the Technology Council of Maryland
 5:30 to 8:30 p.m.
 Bethesda North Marriott Hotel & Conference Center
 5701 Marinelli Road
 North Bethesda, MD 20852
 For more information, e-mail wdudrow@techcouncilmd.com or mferrone@techcouncilmd.com
- May 11 TEDCO Funding Briefing
 Technology Advancement Program
 2 to 3:30 p.m.
 University of Maryland College Park
 387 Technology Drive
 For more information, call 301-314-8121
- May 11 TEDCO Funding Briefing
 2 to 3:30 p.m.
 TEDCO
 5575 Sterrett Place
 Suite 240
 Columbia, MD 21044
 For more information, call 410-740-9442
- May 11 TEDCO Funding Briefing
 2 to 3:30 p.m.
 Chesapeake Innovation Center
 175 Admiral Cochrane Drive
 Suite 400
 Annapolis MD, 21401
 For more information, call 410-224-2030
- May 15-17 2007 Submarine Technology Symposium
 Various times
 The Johns Hopkins University Applied Physics Laboratory
 11100 Johns Hopkins Road
 Laurel, MD 20723
 For more information, call 240-228-8549
- May 25 TEDCO Funding Briefing
 2 to 3:30 p.m.
 Fort Detrick Business Development Office
 201 Thomas Johnson Drive
 Suite 208
 Frederick MD 21702
 301-620-7071
- May 25 TEDCO Funding Briefing
 2 to 3:30 p.m.
 ETC at Canton
 2400 Boston St.
 Factory Building, 3rd Floor
 Baltimore, MD 21224
 For more information, call 410-327-9150
- June 7 InformaticsMaryland 2007
 7 a.m. to 4 p.m.
 Bethesda, MD
 (Exact location to be determined)
 For more information, go to www.informaticscoalition.com or call 410-740-9442

June 8 TEDCO Funding Briefing
 2 to 3:30 p.m.
 Maryland Technology Development Corp.
 5575 Sterrett Place
 Suite 240
 Columbia, MD 21044
 For more information, call 410-740-9442

June 8 TEDCO Funding Briefing - Technology Advancement Program
 2 to 3:30 p.m.
 University of Maryland, College Park
 387 Technology Drive
 College Park, MD 20742
 For more information, call 410-740-9442

June 8 TEDCO Funding Briefing
 2 to 3:30 p.m.
 University of Maryland, Eastern Shore
 Princess Anne, MD 21853
 For more information, call 410-651-2200

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