



A NEWSLETTER FOR ALUMNI AND FRIENDS OF THE DEPARTMENT OF MECHANICAL ENGINEERING AT THE A. JAMES CLARK SCHOOL OF ENGINEERING, UNIVERSITY OF MARYLAND.

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Department Works Globally to Share Knowledge & Expertise

The Department of Mechanical Engineering is at the forefront of academic globalization, gaining worldwide recognition for its collaborative research, student and faculty exchanges, and development of combined Ph.D. programs, while providing both undergraduates and graduate students with opportunities for international learning experiences.

For more than a decade, the Center for Advanced Life Cycle Engineering (CALCE), has worked diligently to share its knowledge and expertise with national centers and university laboratories around the globe. CALCE works with over 100 international organizations such as Samsung, Toshiba, BAE Systems, EADS, Goodrich, TRW Automotive, Siemens, Ericsson, Nokia, Research in Motion, Grundfos, and Philips, providing research support and information services. CALCE recently signed an Agreement of Cooperation with the Hong Kong University of Science and Technology to conduct reliability analysis of electronic products using CALCE software. CALCE has also established a collaborative research agreement with the Institute of Reliability at Beihang at the University of China which will facilitate collaborative research, teaching, and student exchanges in the areas of reliability and prognostics. In November 2004 CALCE and the City University

of Hong Kong have established Joint Failure Analysis Research Laboratories in Hong Kong and the US. In recognition of these accomplishments, Dr. **Michael Pecht**, CALCE Director and George E. Dieter Chair and Professor of Mechanical Engineering, was the recipient of the University's 2006 Distinguished International Service Award, presented by University President C.D. Mote, Jr. at the Office of International Programs' International Day event last fall. Pecht received this prestigious award for his significant contributions to the development of international institutional programs at College Park coupled with a distinguished international career.



DR. MICHAEL PECHT RECEIVES THE 2006 DISTINGUISHED INTERNATIONAL SERVICE AWARD FROM UNIVERSITY PRESIDENT C.D. MOTE, JR.

Department Works Globally
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Attaining Excellence: Progress on the Department Strategic Plan



BAR-COHEN

The mission of the Department of Mechanical Engineering at the University of Maryland is to provide an outstanding education for undergraduates and graduate students, conduct innovative, ground breaking research, address the needs of

citizens, industry, and government, and provide related service to the campus community and the community at large. In recent years the Department name has become synonymous with excellence in mechanical engineering and the Department's 2006-2011 Strategic Plan identified six Initiatives which would serve as the primary vehicles for propelling this Department to among the nation's top 15 Mechanical Engineering programs among all universities – public and private – and top 10 among the publicly supported research universities, by 2011. I am proud to say that in the first 6 months of this Strategic Plan, the Department has made major progress towards this goal, most notably in gaining recognition for its Ph.D. program and substantially expanding its network of international research and education collaborations.

In early 2007 the Chronicle of Higher Education ranked the Department among the top 10 mechanical engineering Ph.D. programs in the country, providing dramatic evidence for the Department's growing visibility on the national stage. The list was headed by UC-Berkeley, with Maryland ranked tenth in this category and 4th among public institutions. The Department's success in the Chronicle rankings was due not only to the aggregated contributions of individual

faculty in publications, citations, grants, and awards, but very importantly to the broad distribution of scholarly activity across the Department. In the U.S. News and World Report's annual ranking of graduate school programs, Mechanical Engineering at Maryland ranked 24th in the nation, 15th among the public institutions, ahead of such nationally recognized programs as U. Penn, Duke, UVa, Lehigh, NCSU, Clemson, and Vanderbilt.

It should also be noted that the Department's Ph.D. production, with over a hundred graduated since 2004, places it highly within the university in doctorate production by department. In the US News and World Report's rankings, the Clark School is tied for 16th among US engineering schools and was recently ranked 13th in the world by the Institute of Higher Education and Center for World-Class Universities at Shanghai Jiao Tong University in China.

The Department's highly successful international collaboration and outreach efforts in the current year are the subject of the lead article in this issue of METRICS. The worldwide partnerships for research and education, created by the CALCE-EPS, CEEE, and Burger Centers, along with the establishment of the Energy Education and Research Collaboration with the Petroleum Institute in Abu Dhabi and the development of a joint PhD program with Pusan National University in Korea, have directly addressed the key "outreach" Initiative in the Department's Strategic Plan. This Initiative focuses on strengthening the ties to Federal laboratories and Centers, international institutions, and the global professional community and aims to build national and international visibility for the Department. Moreover, this has been a "breakthrough" year for the Department's

research, with featured coverage in dozens of television, newspaper, trade and technical journals, and electronic media outlets throughout the year, including The Washington Post and The Today Show. Visit page 6 of this newsletter to see more about our research and faculty in the media.

In recognition of the decade long international outreach effort by CALCE, the Center's Director, Prof. Michael Pecht was presented with the University's Distinguished International Service Award last fall. The Department's faculty were also honored with several additional awards, as described elsewhere in this issue of METRICS, among them Prof. Ashwani Gupta with the University of Maryland President Kirwan Research Award and the Clark School Research Award, and Assistant Professor Teng Li with the Ralph E. Powe Junior Faculty Enhancement Award. Assistant Professor Miao Yu was recently informed of her selection by the National Science Foundation for the prestigious Faculty Early Career Development (CAREER) Award and thus continues the strong tradition of CAREER and PECASE awardees among the Department's junior faculty.

I hope this brief message effectively conveys the excitement and pride permeating this Department. Your support is crucial to our continued success and we welcome your involvement in our educational and research activities. Please plan to visit the Department, attend a Seminar, watch – and maybe even judge - undergraduates presenting their class projects and certainly join us at the next Research Review Day on Friday, April 4, 2008.

- Avram Bar-Cohen, Chair

Research Review Day Highlights Maryland Research

The department hosted a successful Research Review Day open house on March 19 at the College Park campus. The event featured tours of Mechanical Engineering department labs, including the **Smart Systems Lab**, **Center for Advanced Life Cycle Engineering (CALCE)** labs and the **Center for Environmental Energy Engineering (CEEE)** Heat Pump lab.

Department Chair Professor Avram Bar-Cohen opened the afternoon lectures in the Samuel Riggs IV Alumni Center, introducing keynote speaker Dr. Mel Bernstein, Vice President for Research at Maryland, who shed light on the direction of interdisciplinary research at Maryland.

Next year's Research Review Day will take place on Friday, April 4, 2008.

Research Review Day lectures highlighted ME department collaboration with industry and government agencies, and included:

Fuel Cell's Future in Mobile and Stationary Power Generation. Mr. Pat Hearn, Director of Advanced Fuel Cell Products, Ballard Power Systems.

Emerging Developments in Energy Efficient Buildings - Impact on HVAC Equipment. Dr. Karim Amrane, Vice President, Public Policy - Air-Conditioning and Refrigeration Institute, Arlington, VA.

Extreme Temperature Electronics for Planetary Exploration. Dr. Elizabeth Kolawa, NASA Jet Propulsion Laboratory - Pasadena, CA.

Quantification of Security: Some Case Studies. Gerry Sneeringer, Director of IT Security, Office of Information Technology, University of Maryland.

Development of Integrated Microfluidic Biological Nanopore Sensors. Dr. Michael Gaitan, MicroElectroMechanical Systems (MEMS) Project, Electronics and Electrical Engineering Lab, NIST.

Treating Heart Valve Disease: Achievements and Challenges. Prof. Elias Balaras, Dept. of Mechanical Engineering, UMD; & James S. Gammie, MD - Division of Cardiac Surgery University of Maryland Medical.

Irwin Legacy and Future Directions in Mechanics. Featuring participants in the Irwin Symposium: Ben Freund, Brown University; John Fisher, Lehigh University; John Landes, University of Tennessee; Arun Shukla, University of Rhode Island; H.P. Rossmann, University of Vienna; Prof. R.J. Sanford, University of Maryland & Ravi Chona, U.S. Air Force Research Labs.

Over 60 posters were presented at the graduate student research poster session held after the lectures. Winners of each research category can be found on page 7.



DR. MEL BERNSTEIN - VICE-PRESIDENT FOR RESEARCH AT MARYLAND, ASSOCIATE PROFESSOR PATRICK MCCLUSKEY, PEDRO QUINTERO, AND UNIVERSITY PRESIDENT DR. C.D. MOTE, JR.

Department Well-Represented at OTC Invention Awards

Professors **Amr Baz** and **Patrick McCluskey** were among the top three finalists in the Physical Science Invention of the Year Award at the University of Maryland Office of Technology Commercialization (OTC) 20th Annual Invention of the Year Reception held on April 19. Mechanical Engineering invention submissions comprised about a third of the entrants in the Physical Sciences category.

McCluskey's research with **Pedro Quintero** on the "Transient Liquid Phase High Temperature Solder Paste Attach" gained top recognition in the Physical Science category, along with research in "Integrated Sensor Monitoring the Allowable Heat Exposure Time for Firefighters," by Amr Baz and **Marino DiMarzo**.

Each year a panel of judges made up of University of Maryland personnel and industry experts selects one winner from groups of finalists in each of three categories: information science, life science and physical science. The winners are chosen based on the creativity, novelty and potential benefit to society of each of the 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 18 years, OTC has recorded more than 1,400 technologies, secured more than 225 patents and licensed nearly 750 technologies, generating more than \$22.6 million in technology transfer income. In addition, more than 40 high-tech start-up companies have been formed based on technologies developed at the university.

GO ONLINE: RESEARCH REVIEW DAY LECTURES CAN BE VIEWED ONLINE, WITH ACCOMPANYING POWERPOINT PRESENTATIONS HERE:

www.enme.umd.edu/events/RRD/2007/

Keystone Instructors Selected

ME lecturer **Chandrasekhar Thamire** is a recent inductee from the department into the Keystone: the Clark School Academy of Distinguished Professors this year. Thamire is preceded by Professor **Jim Duncan**, Associate Professor **Guangming Zhang**, Professor **Bill Fourney**, and Associate Professor **Ken Kiger**.

Keystone instructors make a commitment to the improvement of education in fundamental engineering courses. The program is a renewable three-year appointment that includes a base salary increase, discretionary funds to support the recipient's activities and additional support personnel.

"I am honored to be chosen for the Keystone program. I am looking forward to working closely with the other Keystone faculty and contributing towards enhancing the content and delivery of the fundamental courses in engineering," says Thamire.

Keystone aims to help improve student retention and graduation rates by ensuring students the best learning experiences in the early, formative stages.

Balaras Promoted to Associate Professor

Ilias Balaras was promoted to Associate Professor with tenure effective July 1.



ASSOC. PROF. ELIAS BALARAS PRESENTS HIS FINDINGS ON IMPROVING THE TREATMENT OF HEART VALVE DISEASE AT RESEARCH REVIEW DAY ON MARCH 19.

Balaras studies computational fluid dynamics, biomedical fluid flows, turbulence and transition and fluid-structure interactions.

Christou Receives ASM Award

Professor **Aris Christou** (materials science and engineering, and reliability engineering) is the winner of the 2006-2007 ASM International George Kimball Burgess Memorial Award. The award was presented April 10 at ASM International's Washington, D.C. chapter meeting in Bethesda, Md. Christou, who conducts research in compound semiconductor materials and process science, radiation effects in materials and devices, manufacturing science, and reliability, was cited "[f]or seminal scientific contributions in the fields of electronic materials, packaging, and devices."

The George Kimball Burgess Memorial Award was established in 1941 by the Washington, D.C. Chapter of the American Society for Metals as a tribute to Dr. Burgess in appreciation of his outstanding contributions to the science of metallurgy. The award is given to a member of the chapter in recognition of outstanding achievement in research or administration and for original contributions to the fields of metallurgy, materials, or mechanics; or to a member who has demonstrated outstanding leadership in those fields within the 5 year period prior to the award.

Gupta Elected Director of Propulsion & Energy at AIAA

Mechanical Engineering Professor **Ashwani K. Gupta** was elected Director-Technical of the Propulsion & Energy Group of The American Institute of Aeronautics and Astronautics (AIAA) on April 13. Gupta's duties began this May and continue for a period of three years.

Gupta also serves on the AIAA Board of Directors. He served previously as the Deputy Director of the Energy group for the past six years.

In this new position Gupta plans to work on AIAA policies that generate high quality technical papers and conferences to benefit the members and aerospace community. He also hopes to further

enhance the propulsion and energy group activities, including education and public outreach activities, to benefit the members internationally.

The Clark School recently bestowed Professor Gupta with the Outstanding Research Award for his exceptionally influential research accomplishments. The award recognizes Gupta's outstanding contributions to the field of combustion with singular success for energy savings and pollution reduction.

Gupta also received the Outstanding Service Award at the 25th International Conference on Incineration and Thermal Treatment Technologies which recognized his years of outstanding service to the thermal treatment community worldwide.

And, his paper "Examination of Methane-Hydrogen Mixture Flame Using Isotope Shift/PLIF Spectroscopy," was awarded Best Terrestrial Energy Systems Paper by the AIAA Terrestrial Energy Systems Technical Committee.

Jackson Wins Distinguished Paper Award

Associate Professor **Greg Jackson** won the Distinguished Paper Award in the New Technology Concepts Colloquium at the Thirty-first International Symposium on Combustion held in Heidelberg, Germany in July 2006. The paper, entitled "Hetero/homogeneous combustion and stability maps in methane-fueled catalytic microreactors," was co-authored by Symeon Karagiannidis and John Mantzaras of the Paul Scherrer Institute and Konstantinos Boulouchos of the Swiss Federal Institute of Technology. The Symposium is sponsored by The Combustion Institute, the premier international society for promoting and disseminating research in combustion science. The work was a result of collaborative efforts while Dr. Jackson was on sabbatical at the Paul Scherrer Institute in 2005.

Kim Named Journal Editor

Associate Professor **Jungho Kim** was named Associate Editor for the International Journal of Multiphase Flow until 2010. The journal publishes theoretical and experimental investigations of multiphase flow which are of relevance and permanent interest in the studies of fluid mechanics and rheological studies. Kim was named ASME Fellow in 2005, and is an advisor for the Maryland student chapter of Engineers Without Borders.

Teng Li Wins Ralph E. Powe Junior Faculty Enhancement Award

Assistant Professor of Mechanical Engineering **Teng Li** was recently granted the Ralph E. Powe Junior Faculty Enhancement Award. Li is one of only two Maryland faculty nominated by the University to compete for this award in 2007. Last year ME faculty **Miao Yu** was granted this award.

The Ralph E. Powe Junior Faculty Enhancement Award provides seed money for research by junior faculty at Oak Ridge Associated Universities (ORAU) member institutions. These awards are intended to enrich the research and professional growth of young faculty and result in new funding opportunities. Li plans to use the funds to support his research to explore innovative structural concepts to enhance the deformability of electronic materials, and based upon such concepts design novel architectures for flexible electronic devices with exceptional deformability and reliability.

Mohammad Modarres Elected as DReAM Division Leader

Professor **Mohammad Modarres** has been elected to serve as the department Faculty Group Leader for the Design, Risk Analysis and Manufacturing (DReAM) leadership team for a 3-year term, Beginning July 1st. Modarres is preceded by Associate Professor **Linda Schmidt**.

Peter Sandborn Earns Best Paper Award

Associate Professor and The Center for Advanced Life Cycle Engineering (CALCE) affiliate **Peter Sandborn** earned The Engineering Economist journal 2006 Best Paper Award for his research “Obsolescence Driven Design Refresh Planning for Sustainment-Dominated Systems,” co-authored by Sandborn’s former graduate student and 2004 ME alumnus **Pameet Singh**, Ph.D.

The paper highlights research on how to better predict when to redesign long-life systems. Long-life systems, such as the electronics in aircraft and 911 communications systems, are manufactured for many years and then have to be maintained for 20 or more years after that. But every electronic part in them is obsolete within the first 5 years. The methodology developed by Singh and Sandborn allows selection of design refresh dates and contents that minimize the sustainment cost of such systems.

The award is given annually by the editors of The Engineering Economist, a joint publication of the Institute of Industrial Engineers’ Engineering Economy Division and American Society of Engineering Education’s (ASEE) Engineering Economy Division.

Sreenivasan Elected to National Academy of Sciences

Katepalli R. Sreenivasan was elected a member of the National Academy of Sciences on May 1st for his outstanding and longtime contributions to the fields of fluid turbulence, complex fluids, combustion, cryogenic helium, and nonlinear dynamics.

In addition to being a part of the mechanical engineering faculty, Sreenivasan’s is Professor and Director of the Institute for Physical Science & Technology, Distinguished University Professor, Glenn L. Martin Professor of Engineering, and Professor of Physics.

Yu Earns Career Award

Assistant Professor Miao Yu (ME/ISR) received a 2007 National Science Foundation Faculty Early Career Development (CAREER) Award for “Biology-Inspired Miniature Optical Directional Microphones: Bridging Biological Systems and Sensor Technology.” Yu’s research transfers biology-inspired ideas into smart, small-scale sensors. This new bio-inspired sensing paradigm for sound localization is expected to have a significant impact in areas such as health care, safety, and defense.

Pi Tau Sigma Honors Guangming Zhang for 2nd Year in a Row

The Tau Mu Chapter of Pi Tau Sigma, honored Associate Professor **Guangming Zhang** on December 6th. Zhang was honored with the award for the second year in a row due to his dedication to students and willingness to spend as much time and effort needed to make sure the students understood the material. The students felt he did an exemplary job conveying the information typically taught in two or three courses in a single course in a clear manner.

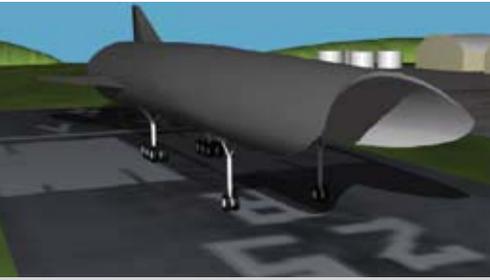
Patents Issued

A patent issued this winter for “Electrohydrodynamically (EHD) Enhanced Heat Transfer System and Method with an Encapsulated Electrode” by Professor **Michael Ohadi** and Research Associate Professor **Serguei V. Dessiatoun** was approved by the U.S. Patent and Trade Office. Their invention helps increase the efficiency of waste heat utilization in low temperature heat recovery applications as well as in low temperature power and refrigeration cycles. For more detailed information about this invention, visit:

www.patentstorm.us/patents/7159646.html

A.K. Gupta's Research Advances Advent of 'Hypersonic' Space Plane

Through two Maryland Industrial Partnerships Program (MIPS) projects, Professor **Ashwani Gupta**, and Kenneth Yu (Aerospace Engineering) along with graduate student Ram Balar, successfully designed and tested a combustor for the Astrox space plane, which uses an inward-turning scramjet engine. Such a plane would not only shorten flights - designers estimate a flight to Australia could one day be as short as two hours - but also provide travelers with a bird's-eye view of the earth as the



COMPUTER-GENERATED IMAGE OF A SCRAMJET.

plane orbits around the globe during the flight. The collaboration with College Park-based Astrox Corporation is part of a tech transfer through MIPS, a program designed to accelerate commercialization of technology by funding joint research projects.

Jeong Kim Inducted into Maryland Business Hall of Fame

The Maryland Chamber of Commerce inducted **Jeong Kim**, Ph.D and Professor of Practice in the department, among three outstanding business leaders into the Maryland Business Hall of Fame on May 10, during their Annual Meeting and Business Hall of Fame Awards Dinner in Baltimore.

Kim is president of Alcatel-Lucent's Bell Labs, overseeing the communication industry's most heralded research organization. In 1992, he founded Yurie Systems, Inc, where he pioneered the development of a revolutionary asynchronous transfer mode (ATM) switch for wireless applications. The ATM switch became a pivotal key in the modernization of telecommunications systems for today's digital market. In May 1998, Lucent Technologies acquired Yurie Systems, Inc. for more than \$1 billion. During his tenure at Lucent, Dr. Kim initially served as the president of Lucent's former Broadband Carrier Networks. In 1999 Dr. Kim was named chief operating officer and later president of Lucent's Optical Network Group (ONG). Dr. Kim left Lucent in 2001 to join the University of Maryland faculty, with joint appointments in both the department of Electrical and Computer Engineering and the department of Mechanical Engineering. He rejoined the Lucent in April of 2005 as president of Bell Labs.

Bar-Cohen Quoted in 'Hot Spots' Article

Last August Professor and department Chair **Avram Bar-Cohen** was quoted in the article "Nextreme Seeks to Beat Heat," by Bill Roberts, Contributing Writer for Electronic Business. The article was reposted on numerous technology, heat transfer and trade journal websites throughout late 2006. Bar-Cohen's expertise in improved thermoelectric cooling devices was requested to help answer the problem of cooling 'hot spots' on increasingly smaller microprocessing chips. "Using these thermoelectric devices is the most elegant approach to the hot spot problem," says Bar-Cohen.

Guardian Article Cites Cukier's Research

A study conducted by **Michel Cukier**, A. James Clark School Assistant Professor of Mechanical Engineering and affiliate of the Clark School's Center for Risk and Reliability and Institute for Systems Research, was cited in a front-page news article in the April 6, 2007 Technology section of The Guardian online.

"How the Web Became a Sexists' Paradise," by Jessica Valenti, brings light to the online threats female bloggers and Internet users face today:

"A recent study showed that when the gender of an online username appears female, they are 25 times more likely to experience harassment. The study found that female user-names averaged 163 threatening and/or sexually explicit messages a day."

Cukier's research on the topic has previously been cited in ABC News online ("Female Chat Names Generate More Threats") and in the April 30th issue of The Washington Post ("Sexual Threats Stifle Some Female Bloggers," By Ellen Nakashima), as well as a similar study that found computers connected to the Internet are attacked every 39 seconds ("Got A PC? You Need A Firewall") in Forbes' online magazine.

S.K. Gupta Featured in Mechanical Engineering Magazine

Associate Professor **S.K. Gupta** (ME/ISR) was interviewed by Mechanical Engineering Magazine, the premier publication of American Society of Mechanical Engineers, for a feature article about the future of computer-aided manufacturing systems. "What designers ideally want to get to is a system where, after finishing a design, they could press a button on the computer and fabrication could automatically begin," Gupta says in the story. His lab is working on algorithms that would power computer-aided design toward such an end. The article, "Where Does CAM Stand?" can be read in the January 2007 archives of the Mechanical Engineering Magazine website:

www.memagazine.org

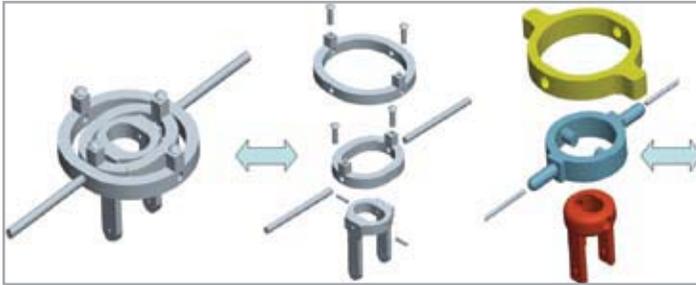


IMAGE FROM ARVIND ANANTHANARAYANAN'S WINNING POSTER, "DEVELOPMENT OF IN-MOLD ASSEMBLY METHODS FOR PRODUCING ARTICULATED JOINTS," ADVISOR: S.K. GUPTA, SPONSORS: U.S. ARMY AND THE NATIONAL SCIENCE FOUNDATION.

**Research Review Day Graduate Student Posters
(continued from page 3, winning poster image at left)**

After the Research Review Day lectures, a graduate student research poster exhibition and reception was held to showcase outstanding research among graduate students. The following posters were judged to be outstanding within their particular research categories:

Advanced Manufacturing and Design

1st place: Arvind Ananthanarayanan, "Development of In-Mold Assembly Methods for Producing Articulated Joints," 2nd place: Jeb Brough, "Utilizing Virtual Environments to Facilitate Knowledge Preservation and Accelerated Learning," 3rd place: Anand Pillarisetti, "Medical Robotics Research at Robotics, Automation, Manipulation and Sensing (RAMS) Laboratory."

Energy Systems

1st place: Joshua Pearlman, "Efficiency & Water Balance in PEM Fuel Cell Systems with Liquid Fuel Processing and H2 Membranes," 2nd place: Dae Whan, "Liquid Cooling of LED Arrays," 3rd place: Joseph Currano, "Heat Flux Based Emissivity Measurements."

Fluid Mechanics

1st place: Greg Anderson, "A Diode Array Sensor for Studying Pool Boiling," 2nd place: Rishi Raj, "Thermocapillary Convection During Subcooled Boiling in Reduced Gravity Environments," 3rd place: Derrick Treichler, "Flooding of a Submerged Volume Due to Cavitation Bubble Collapse and Ventilation."

Mechanics and Micro-Nano Systems

1st place: Pedro Bueno, "Optical Analysis of Coated and Uncoated Soot Particles: Data for Global Climate Change Models," 2nd place: Yuxiang Liu, "Three-Dimensional Fiber Optical Tweezers for Cell Manipulation and Force Sensing," 3rd place: Arvind Balijepalli, "Physically Accurate Simulations for Flexible Nano-Manufacturing."

Risk and Reliability

1st place: Sachin Kumar, "Prognostics and Health Management of Electronics," 2nd place: Pedro Quintero, "High Temperature Lead-Free Attach Reliability," 3rd place: Katrina Groth, "A Model-Based Framework to Integrate Safety Information into Risk Management Systems."

Department Works Globally

continued from page 1

The Department's growing international efforts span the globe. Mechanical engineering students and faculty are among the leaders of the Clark School's Engineers Without Borders projects in West Africa and South America; the Center for Environmental Energy Engineering (CEEE) has long coordinated an exchange program with two universities in Germany and is hosting ten Diploma students and two German Fulbright fellowship students this spring; under Prof. **Reinhard Radermacher's** leadership CEEE has also entered collaboration agreements with Brazil, Korea, and China; collaborative efforts continue with the Tel Aviv University in Israel; thru the Burgers Program for Fluid Mechanics, headed by ME Professor **James Wallace**, Prof. Jerry Westerweel from the Technical University of Delft, the Netherlands is currently visiting the Department to teach and collaborate on the development of Particle Image Velocimetry (PIV) techniques; the ME-led Energy Education and Research Collaboration (EERC) between the Clark School and the Petroleum Institute (PI) in Abu Dhabi has seen two PI professors visit Maryland and ten Maryland faculty visit the UAE during the past year to teach courses, launch joint research projects, and participate in an international workshop with PI faculty.

As a further indication of the global reach of the Department, six Mechanical Engineering faculty from Pusan National University (PNU) in Korea met with their counterparts in the Department this May to solidify plans for a joint ME Ph.D. program between the two institutions.

These international collaborations are well aligned with the Department's goal of combining traditional classroom instruction with a non-traditional "distinct" educational experience for each of its undergraduate and graduate students. By sharing its knowledge and expertise, the Mechanical Engineering Department is successfully meeting the globalization challenge of the 21st century and laying the foundation for greater international impact and visibility in the decades ahead.

For more news about our international efforts, visit page 12.

ME Ph.D. Students Prepped for Success with the Clark School's Future Faculty Program (FFP)

Several graduate students from the department have been accepted into the Clark School's Future Faculty Program (FFP), designed to increase the number of Clark School Ph.D. graduates who obtain academic positions in the future. **Arvind Ananthanarayanan** (Advisor: S.K. Gupta), **Gayatri Cuddalorepatta** (Advisor: Abhijit Dasgupta), **Omar Abd El Aziz** (Advisor: Reinhard Radermacher), **Edvin Cetegen** (Advisor: Michael Ohadi), **Payam Delgoshaei** (Advisor: Junggho Kim), **Yuxiang Liu** (Advisor: Miao Yu) and **Vincent Nguyen** (Advisor: Bala Balachandran) participate in the program. The FFP consists of a sequence of three one-credit training seminars, a teaching practicum and a research mentoring practicum. The program takes between three and five semesters to complete depending on the timing of the practicums.

Gahagan Awarded 1st Place in IIE Student Paper Competition

Mechanical Engineering Ph.D. candidate **Sean M. Gahagan** was awarded First Place in the 1st Institute of Industrial Engineers (IIE) Lean Student Paper Competition sponsored by J.T. and Carol S. Black. Gahagan presented his winning paper, entitled "Adding Value to Value Stream Mapping; A Simulation Model Template for VSM," at the IIE Annual Conference and Expo in Nashville this May. Gahagan developed a Value Stream Mapping (VSM) template in Arena, a simulation software package that allows the user to create maps in the Arena workspace that can be cut-and-pasted into other presentation applications, but are also fully-functional simulation models of the value stream. He works full-time for Northrop Grumman Corporation in addition to conducting his research under the advisement of **Jeffrey Herrmann**, Associate Professor of Mechanical Engineering and the Institute for Systems Research.

Goswami Earns Ann G. Wylie Dissertation Fellowship Award

Mechanical Engineering Ph.D. candidate **Arindam Goswami** was awarded the Ann G. Wylie Dissertation Fellowship by the Graduate School of Maryland. The award supports Goswami's research in "Quantitative Assessment of Hermeticity of Micro-to Nano-liter Scale Packages." The fellowship will provide financial support for either the fall 2007 or the spring 2008 semester, and was intended for students who are in the final stages of writing their dissertations. After graduating, Arindam intends to apply his research to the characterization of current and future advanced Micro-electro-mechanical systems (MEMS) packages. Goswami is advised by Professor **Bongtae Han**. When he's not conducting research he is an active member of the Prince George's County Rotaract Club.

Kota Wins Competitive Campus GRID Award

Mechanical Engineering graduate student **Arun Kota** earned the Award of Excellence in the Mechanics, Modeling, and Predictions category at the Graduate Research Interaction Day (GRID) on April 12 in the Stamp Student Union at Maryland. His research in a "Combinatorial Approach to Develop and Characterize Multifunctional Polymer Nanocomposites," was judged to offer the best approach to diverse practical problems in the category at the competition. The judging panel consisted of members of Maryland's Graduate School, Office of Research, Office of the Provost and the Graduate Student Government. GRID is conducted as a one-day inter-disciplinary and inter-program symposium consisting of both poster and oral presentations for all UMCP graduate students. Kota is advised by Associate Professor **Hugh Bruck**, working closely with Associate Professor **David Bigio**. Kota was also recently awarded a travel grant from the Society of Plastics Engineers (SPE) to present a portion of his Ph.D. research at the SPE Annual Technical Conference in Cincinnati, Ohio in early May.



KOTA

Mohammad Pourgol-Mohamad Winner of DCCEAS Graduate Student Paper Competition

Reliability Engineering Ph.D. student **Mohammad Pourgol-Mohamad** won the graduate category of the District of Columbia Council of Engineering and Architectural Societies (DCCEAS) college student paper competition. He was presented the award for his paper, entitled "Treatment of Uncertainties; Output Updating in Complex Thermal-Hydraulics (TH) Computational Codes," at the DCCEAS Awards Banquet held during the National Engineers Week in February at the Crowne Plaza Hotel in Silver Spring, Maryland. Mohammad is advised by Professor of Reliability Engineering **Mohammad Modarres**. The District of Columbia Council of Engineering and Architectural Societies helps the engineering, architectural, and technically related organizations in the District of Columbia metropolitan area render public service and advance the professions through public interest, scientific, and educational pursuits.

Cuddalorepatta & Mohaghegh Both Earn Amelia Earhart International Awards

Congratulations to ME Ph.D. candidate **Gayatri Cuddalorepatta** and Reliability Engineering Ph.D. candidate **Zahra Mohaghegh-Ahmadabadi** for both earning a 2007-2008 Amelia Earhart International Award in recognition of and support for their doctoral research.

Cuddalorepatta is advised by Professor **Abijit Dasgupta**, and her research seeks to facilitate the elimination of lead from electronics. The focus of her research is the in-depth understanding of micro- and nanoscale damage accumulation mechanisms in lead-free solders.



CUDDALOREPATT

Ms. Mohaghegh is advised by Professor **Ali Mosleh**. Her work extends the domain of complex systems modeling beyond the traditional scope, to formally include the human and organizational environments of the system in development and operation. The award is granted annually by the Zonta International Foundation to highly qualified women pursuing a Ph.D. or doctoral degree in aerospace-related sciences and engineering. The award will be presented by the Zonta district of Mid-Atlantic North America this summer.



MOHAGHEGH

Zonta International is a global service organization of business and research professionals working together to advance the status of women all over the world. As an international non-governmental organization (NGO), Zonta brings women's concerns to the United Nations, suggesting solutions and bringing public awareness to issues.

Pi Tau Sigma Honors Outstanding Teaching Assistant Rajesh Pavan Sunkari

The Tau Mu Chapter of Pi Tau Sigma, the University of Maryland's Honorary Mechanical Engineering Honor Society, honored teaching assistant **Rajesh Pavan Sunkari** with the Fall 2006 Outstanding Teaching Assistant Award during their initiation ceremony on December 6th. Sunkari was recognized for his approachability, responsiveness to questions, and for spending extra time outside of class with the students. Rajesh is advised by Associate Professor **Linda Schmidt**.

The award is given each semester to a Teaching Assistant in the department by Pi Tau Sigma. The award consists of \$500 from the Department, along with a certificate and an engraved plaque. During a regular meeting, members of Pi Tau Sigma nominate TAs and give a brief speech as to why each nominee should receive the award. At a following meeting, members of Pi Tau Sigma vote on the nominees and select a winner. The faculty advisor for Pi Tau Sigma is Associate Professor **Jungho Kim**.

University Recognizes Distinguished Teaching Assistants

ME graduate teaching assistants **Danielle Chrun**, **James Borrelli**, **Mary Vechery**, and **Philip Knowles** were selected as 2006-2007 Distinguished Teaching Assistants. They received their certificate at the annual Distinguished Teaching Assistant Ceremony on Friday, May 11 in Alumni Hall of the Samuel Riggs IV Alumni Center.

At the end of the academic year, the Center for Teaching Excellence, the Dean for Undergraduate Studies, and the Dean of the Graduate School recognizes outstanding graduate teaching assistants at the University of Maryland. At the beginning of the spring semester, Distinguished Teaching Assistants are selected by department chairpersons.

Flexible Macroelectronics Film Earns Top Award in Sci/Terp Video Competition

Two undergraduate students from the A. James Clark School of Engineering advised by Assistant Professor **Teng Li** won 2nd Place in the First Annual University of Maryland Undergraduate Science/Engineering/Technology Video Competition this April. Team leader **Edward Dechaumphai** (ME) and Jon Chung (Bioengineering) produced a 4-minute video titled, "Bringing the Future to the Present: Flexible Macroelectronics."

"I'm especially proud of Ed and Jon for this award because both team members are freshmen," said Professor Li. "Their video demonstrated the potential uses for flexible macroelectronics, such as wrist-held cell phones and electronic paper, and included some original animation."

Sci/Terp is a competition organized by the Office of University Communications asking undergraduates to make a short video that explains their science, engineering, or technology research to a lay audience. Ellen Ternes of University Communications, who launched the program, states "I feel very strongly that we achieved our goals, which were to establish a solid foundation, and see what students would come up with." Other entrants included videos on fire protection and safety, photolithography, and orthopaedic mechanobiology.

Students were asked to produce a short video that would be understandable to middle school age students, demonstrate what they are doing, and why it's exciting or interesting. Winning videos will be shown on the Maryland and ME websites and distributed to school systems in Maryland.

GO ONLINE: VIEW THE VIDEO: "BRINGING THE FUTURE TO THE PRESENT: FLEXIBLE MACROELECTRONICS"

www.enme.umd.edu/news/news_story.php?id=2099

CALCE Hosts International Tin Whisker Symposium



MICROSCOPIC VIEW OF TIN WHISKER FORMATION ON A METAL SURFACE.

The Center for Advanced Life Cycle Engineering (CALCE) hosted an International Symposium on Tin Whiskers on April 24 and 25 at the Samuel Riggs Alumni Center. The Symposium attracted over 160 individuals from some 70 organizations

and 15 countries, including representatives from Yokohama and Osaka Japan and the United Kingdom. Twenty-six presentations were made in the two-day symposium.

Tin whisker formation, the spontaneous growth of tiny hair-like conductive filaments for lead-free tin-based metal finishes, remains a challenge to electronic equipment manufacturers as well as organizations involved in systems procurement. While tin whisker formation is known to occur on lead-free tin finishes, a large portion of electronic part manufacturers have selected tin-based finishes to comply with government regulations and market pressures.

In 2006, CALCE was featured in a segment on tin whiskers on the History Channel's Modern Marvels television program. CALCE has focused on tin whisker risk assessment and continues to provide support to organizations dealing with this issue.

For more information on CALCE and tin whisker research, visit: www.calce.umd.edu

New Energy Systems Engineering Curriculum

A consortium of Clark School departments including Mechanical Engineering are offering a new curriculum in Energy Systems Engineering (ESE). The curriculum was designed by the Energy Systems Engineering Field committee professors **Ashwani Gupta, Greg Jackson, Jungho Kim, Mohammad Modarres, Steve Gabriel, Deborah Goodings, Thomas Antonsen, Patrick O'Shea, Aris Christou** and **Reinhard Radermacher** serving as spokesperson.

The new program will provide a coherent approach to energy engineering; equipping its students with the tools needed to conceptualize, analyze, design and integrate advanced energy systems, informed by a broad perspective on energy production, transmission and utilization technology options and trade-offs and an appreciation for related public policy and regulatory issues.

Participating students will be expected to complete the M.S. or Ph.D. degree requirements of their respective departments, while taking as many courses as possible from the ESE curriculum. For more information about this program and a list of courses and links to participating professors' websites, visit: www.enme.umd.edu/grad/courses6-energy.html

CALCE/ME-Mentored High School Student Wins National Junior Science Award

Wilde Lake High School student **Phillip Sandborn** won 1st place in the Engineering Division at the 2007 National Junior Science and Humanities Symposium (JSHS). Phillip's research project "A Random Trimming Approach for Obtaining High-Precision Embedded Resistors," was mentored by **Peter Sandborn**, Associate Professor of mechanical engineering and member of the Center for Advanced Life Cycle Engineering (CALCE). JSHS is the advanced research paper competition for high school science fair students.

The project focused on electronic resistor components fabricated inside printed circuit boards. These "embedded" resistors are difficult to fabricate to required values and therefore have to be "trimmed" using lasers. Phillip's project developed and experimentally verified a computer simulation for the embedded resistor trimming process. The simulation was used to study embedded resistors containing randomly placed voids of varying size and a new trimming approach was proposed that allows higher precision embedded resistors to be obtained. A version of the paper has been accepted for publication in the IEEE Transactions on Advanced Packaging technical journal.

Phillip won the Maryland regional competition in April and competed at the national JSHS against the winners from 48 regional competitions in the United States, Puerto Rico, Europe, and the Pacific. The JSHS competition is sponsored by the U.S. Department of Defense and the Academy of Applied Sciences.

CECD Receives Additional Office of Naval Research Funds

The Office of Naval Research has informed Professor **Dave Anand** that the **Center for Energetic Concepts Development (CECD)** will be receiving \$4.8 million of funding in support of CECD activities. This is in addition to the \$2.68 million award received in Fall 2006 to support workforce development initiatives and research and development work in two specialized areas: energetic devices and risk assessment for large-scale chemical releases in harbors.

"This work with the Navy, together with the establishment of our Energetics Technology Center (ETC), will help CECD fulfill its vision of becoming a National Center of Excellence in Energetics," says Anand.

CECD/NSWC/ETC Workshop

A technology workshop was held at the University of Maryland Conference Center at College Park on December 20. Key members present included the **Center for Energetic Concepts Development**, the Naval Surface Warfare Center Indian Head Division, and the Energetics Technology Center's technical and leadership teams. More than twenty scientists and engineers gave brief presentations on potential areas of collaboration between the three organizations. The focused outcome will be three to four targeted technology initiatives that will be further developed in 2007 by IHDIV/NSWC, CECD, and ETC teams.

CECD/ETC/NSWC Workshop attendees, University Inn & Conference Center, College Park, December 20, 2006:

Front: Stephen Lubard, Dave Anand, Jerry LaCamera, Richard Nadolink; **2nd Row:** Gerry Pangilinan, Bob Kaczmarek, Carl Gotzmer, Fred Zimmerman, Adam Nave, Joe Shannon; **3rd Row:** Jerry Forbes, Ruth Doherty, Amy O'Donnell, S.K. Gupta, Al Stern; **Back:** Frank Tse, Jeffrey Herrmann, Don DeVoe, Bob Kavetsky, Michael Zachariah, Greg Jackson. Not pictured: Steve Mitchell.



KEY MEMBERS OF THE CENTER FOR ENERGETIC CONCEPTS DEVELOPMENT, THE NAVAL SURFACE WARFARE CENTER INDIAN HEAD DIVISION, AND THE ENERGETICS TECHNOLOGY CENTER.

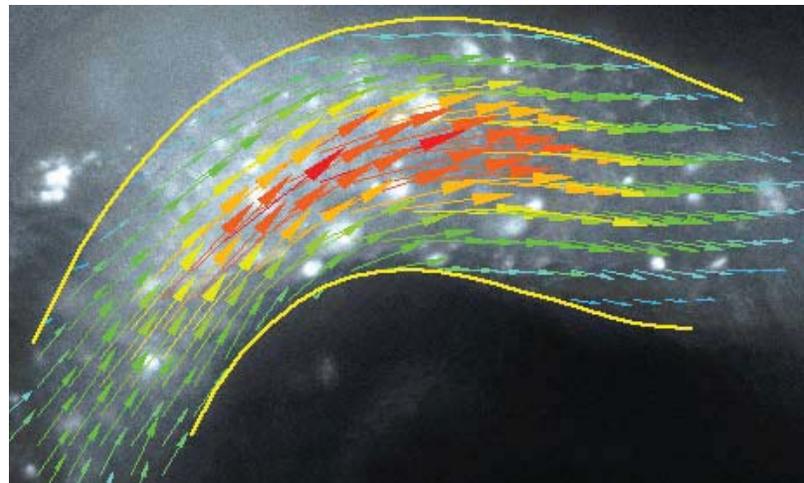
Particle Image Velocimetry (PIV): Theory, Practice and Application Workshop

The **Burgers Program for Fluid Dynamics** and the Department of Mechanical Engineering hosted a tutorial workshop on the theory and application of Particle Image Velocimetry (PIV) in conjunction with the sabbatical visit of Professor Jerry Westerweel. The workshop took place on May 22-23 in the Jeong H. Kim Building Kay Boardroom, Thermofluids Lab, and computer lab.

Professor Westerweel is a pioneer in the development of PIV, and its extension into numerous diverse applications in turbulence, biological and multiphase flow research. In addition, LaVision, Inc., participated to provide hands-on experience through laboratory demonstration exercises and use of their processing software.

The tutorial workshop was intended to provide an overview of quantitative image velocimetry methods, with an emphasis on the relevant background theory, examples of "best practices" techniques, combined with hands-on tutorial experience. In addition, an overview of several specialized PIV applications and recent developments in novel PIV techniques were presented.

The workshop was intended for both current and future practitioners of PIV with a broad range of background experience. The first day of the workshop focused on fundamentals of the method, combined with hands-on hardware demonstrations and example calculations. The second day focused on discussion of more advanced techniques, special applications, and new developments in image velocimetry methods.



IMAGING TECHNIQUE SHOWING THE VELOCITY FIELD WITHIN A LIVING EMBRYONIC CHICKEN HEART.

Agreement Marks Exchange Program's 20th Anniversary

What started out as a small student exchange between the Department of Mechanical Engineering and the University of Applied Sciences in Mannheim, Germany has grown to offer student training for foreign visitors interested in a variety of research opportunities offered by the A. James Clark School of Engineering.

The program has recently added a new agreement with Wolfenbuettel University of Applied Sciences in Germany, providing even more opportunities for exchange for the Clark School.

Each year the Exchange Visitor Training Program grants a small number of internship and training opportunities for international students anywhere from three months to a year with the Clark School. For example, all exchange students who work within the Center for Environmental Energy Engineering (CEEE) are here for six months or more.

So far about 350 students have participated in this program, with Mechanical Engineering offering over a dozen placements with more than twenty professors hosting students. Some have been able to use the internship to complete their diploma or Master's Thesis, some using the program to fulfill the practical training requirements of their home institutions, with all students having gained valuable international experience.

One of the longstanding partners is the Berlin Technical University, sending one to two students annually since the program's inception. Maryland has hosted students from France, Italy, Turkey and South Africa, as well as several other German Universities.

The exchange program has existed since the 1988 fall semester within the Department of Mechanical Engineering, initially administered by Dr. **Dirse Sallet**. Professor **Reinhard Radermacher** took over the program in the early 90's with support from Jane Fines, Director of Undergraduate Recruitment and Special Programs in the Clark School.

The exchange program administrators hope to cultivate more involvement from Maryland host professors and labs, and to expand the program to encourage more international partnerships. More importantly, they hope to get more Maryland students to visit the foreign institutions as well.

Department Welcomes German Fulbright Scholars

Two students from Germany are spending an academic year with the Mechanical Engineering department in the A. James Clark School of Engineering as part of The German-American Fulbright Program, designed to foster mutual understanding between the American and German people.

Matthias Irsmscher is a visiting graduate student from Berlin, and studies at the Technical University of Ilmenau. He has been working with Associate Professor **Elisabeth Smela** to learn more about micro-electro-mechanical systems (MEMS), specifically with a new type of actuator based on electro-osmosis. "The practical experience in the cleanroom I am getting is invaluable and will surely help me on future projects," says Irsmscher.

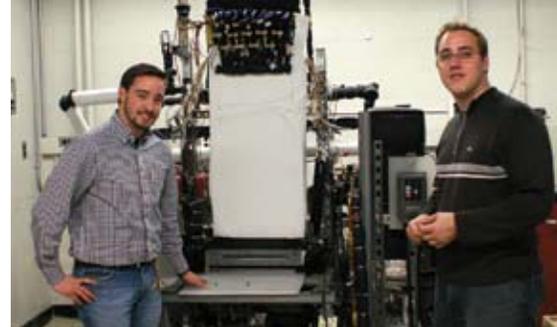
Alexander Lacher is an M.S. student from the Technical University of Berlin advised by Assistant Professor of Mechanical Engineering **Miao Yu**. Lacher's research topic is on continuum mechanics, and his research focus is in



LACHER

fiber optic sensor systems. He is currently working on a bio-inspired directional microphone device and on a fiber optic pressure measurement system for aircraft applications.

The German-American Fulbright Program implements Senator J. William Fulbright's vision to promote mutual understanding between our two countries through academic and bicultural exchange.



EXCHANGE VISITOR TRAINING PROGRAM PARTICIPANTS MAGNUS EISELE & JAN MUEHLBAUER IN THE LAB WHERE THEY CONDUCT HEAT EXCHANGER TESTING.

Magnus Eisele, program participant:

"Participating in the exchange program not only gave me the opportunity to develop my language skills, but it also shaped my character and broadened my horizon. Today I feel and think much more as a citizen of the world, not as a citizen of my home country anymore. Coping with all the small challenges before and during your stay in a foreign country boosts your experience more than a dozen years of everyday life in your home country."

New Cooperation with Korean University Promises Future Student, Faculty Exchange

A new international exchange agreement was signed between the Department and Pusan National University (PNU) in the Busan province of the Republic of Korea. This agreement is yet another in a series of international cooperative exchanges with the department that share faculty, research activities, mutual recognition of courses, student exchange and shared internships.

This five-year Ph.D. program agreement with PNU is funded in part by the Brain Korea 21 (BK21) Program, a human resource development program recently initiated by Korea's Ministry of Education. The Ministry has targeted what it considers the seven most important fields in science and technology necessary to enhance Korea's competitiveness in the 21st century.

Maryland faculty currently selected for this exchange include Professors **Avram Bar-Cohen**, **Balakumar Balachandran**, **Bongtae Han**, **Michael Zachariah**, **Elisabeth Smela**, and **S.K. Gupta**. Representatives from PNU arrived in May to discuss program details, goals, and to visit various engineering labs.

ENGINEERING CHANGE IN BURKINA FASO, AFRICA

Department faculty, students assist in aid to village.

Three Clark School students and two faculty from the Mechanical Engineering department rang in the new year improving the quality of life for a community in the West African country Burkina Faso. Through a project sponsored by the UMD student chapter of Engineers Without Borders, the team installed solar panels and indoor lighting in an adult education center. The installed lighting now allows people of all ages to study later into the evening. The illuminated school will also be available for evening community meetings and other village gatherings.

The in-country contact was Mechanical Engineering undergraduate Thierry Some, whose family lives in Burkina Faso. Accompanying Thierry was team leader and engineering graduate student Jason West, and co-leader Kana Matsui, a sophomore civil engineering student. Faculty advisors **Jung**



A BURKINABÉ ENGINEER ASSISTS TEAM LEADER JASON WEST

Kim and **Elisabeth Smela** from the Mechanical Engineering department accompanied the students on the trip.

The main purpose of the trip, in addition to installing the lights and solar panels, was to assess and plan future development projects. The team also evaluated other villages to assess future

needs, such as small garden irrigation, solar water pumping, and water sanitation projects. The team plans to return to Burkina Faso in January 2008.

Other campus Engineers Without Borders projects include improving water sanitation in Ecuador, advised by Mechanical Engineering faculty **Elias Balaras**; potable water and irrigation enhancements in Thailand, advised by Civil Engineering faculty Deborah Goodings; and the improvement of potable water availability in Brazil, a project advised by Peter Chang from Civil Engineering.

Photos courtesy of Associate Professor **Elisabeth Smela**, Mechanical Engineering.



KANA MATSUI INSTALLS A SOLAR PANEL ARRAY



ELISABETH SMELA AND JUNGGHO KIM WITH ENGINEERS FROM BOBO-DIOULASSO.

Professors A.K. Gupta, Ohadi Chair International Energy Conference

Professor **Ashwani K. Gupta** was co-chair of the First International Energy 2030 Conference held in Abu Dhabi during November 1-2, 2006. Professor **Michael Ohadi** (on leave serving in Abu Dhabi) was the Conference Chair and His Excellency Yousef Omair bin Yousef was the Honorary Chair of this conference. The conference was sponsored by the Abu Dhabi National Oil Company (ADNOC) and its selected affiliate companies. Opening and welcoming remarks at the conference were delivered by HE Mohammad bin Dhaen Hameli, The Minister of Energy, and HE Yousef Omair bin Yousef, CEO of ADNOC. Approximately 400 individuals from several counties worldwide attended the

conference. The program included 18 invited presentations on various aspects of energy, including supply and availability, sustainability, and environmental issues. In addition to invited presentations, the program included 39 poster/paper presentations. Professors Gupta and Ohadi gave invited presentations at this conference. The conference proceedings, published as ISBN 9948-03-283-7, are available from The Petroleum Institute, Abu Dhabi, UAE.

The primary focus of the conference was to share views and information of pivotal importance in the strategic planning of research and development in the oil and gas industries and the broader energy areas, including energy availability

and usage, transport, and environmental issues.

The conference was part of an ongoing cooperative relationship initiated between Maryland and The Petroleum Institute (PI) of Abu Dhabi to establish an Education and Energy Research Collaboration. The agreement seeks to initiate and develop collaborative educational and research activities in the field of energy sciences and engineering, and to enhance the undergraduate, graduate, and continuing education programs of both institutions.



Ashley Hired by NRMCA

Erin Ashley (M.S. Reliability '04, Ph.D. '07), has been hired as director of codes and sustainability by the National Ready Mixed Concrete Association (NRMCA). She will provide technical support to NRMCA members and state affiliates regarding local building codes and green building standards; work with local members and state affiliates to promote the adoption of statewide minimum building codes and will represent NRMCA at International Code Council and National Fire Protection Association hearings. Ashley will also represent NRMCA at sustainability standards development organizations. She is currently completing her Ph.D. in reliability engineering at the University of Maryland. Before joining NRMCA Ashley was a project engineer with Combustion Science & Engineering, Inc., Columbia, Maryland.

Daghir Helps Grade-School Students with After-School Learning Program

Mark Daghir (M.S. '94) helps offer an after-school science program at Darlington Elementary School in Maryland with the help of Dave Mentzer, also an engineer. The PTA-sponsored activity was created for third- through fifth-graders and is held once or twice a month. Activities range from experiments in magnetism and electricity, to astronomy and field trips, or to science fairs in Baltimore. Daghir said he started the program to enhance what his children were learning in the classroom. Mark earned his B.S. in Aerospace Engineering from the U.S. Naval Academy.

Hatwell Founds Aegis Construction

David Hatwell (B.S. '06), co-founded Aegis Construction Consultants this winter, a company specializing in Critical Path Method (CPM) scheduling and construction contract claim analysis. While working with contractors, sub-contractors and construction owners Hatwell became a qualified expert in the field of CPM scheduling and forensic analysis of construction projects. In addition to CPM scheduling, cost and loss of productivity analysis, Aegis helps contractors and owners who are having problems keeping their projects on track. Prior to co-founding Aegis, Hatwell was a vice president of scheduling and claims at Brower, Kriz and Stynchcomb, LLC managing construction schedules and disputes. Hatwell is a member of the



HATWELL

American Society of Mechanical Engineers, the Association for the Advancement of Cost Engineering and the Project Management Institute.

Tryon Decorated with Army Commendation Medal

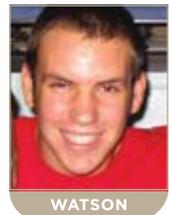
Navy Reserve Commander **Thomas T. Tryon** (B.S. '89) has been decorated with the Army Commendation Medal for participating in Operation Iraqi Freedom. The medal is awarded to individuals who, while serving in any capacity with the Army, have distinguished themselves by acts of heroism, meritorious achievement or meritorious service.

Commander Tryon received the medal for meritorious service as the director of the Facilities Engineer Team-South at Camp Arifjan, Kuwait. His professional skill and management expertise were critical to the successful completion of joint service project missions.

In Memoriam

The department is saddened to report the passing of ME alumnus **Oliver Richard "Dick" Bell** (B.S. '53), **Joseph A. Sirkis** (B.S. '42), **Arnold Korab** (B.S. '38), and **Byron L. Carpenter** (B.S. '39).

Undergraduate student **Matthew Winter Watson** of Ellicott City, Maryland passed away on May 5 from injuries sustained in a car accident in College Park. He was born Oct. 28, 1986, in Philadelphia to Gavin M. and Barbara W. Watson. He was a member of the Theta Chi fraternity. Services were held on May 11 at the Church of the Resurrection in Ellicott City, Maryland.



WATSON

Department Remembers Willie Mae Webb

Willie Mae Webb, a technical assistant to the Reliability Engineering program for 15 years, died of complications from respiratory ailments and lung cancer on April 10, 2007 at the age of 63. Willie was in hospice at the Washington, D.C. Veteran's Administration Hospital after a seven-month struggle. Willie supported Professors Mohammad Modarres and Ali Mosleh, especially in distance delivery of the reliability courses, and co-authored many reliability texts and reference books. She was born in Arkansas on February 26, 1944.

She was buried at the Chesed Shel Emmes Cemetery in Washington, DC on Monday April 16, 2007. Her outgoing and friendly presence will be missed by many people whose lives she touched. A memorial event in celebration of her life was held at the Stamp Student Union Prince George's Room on May 18th.



WEBB



TESTUDO

Terp Mechanical Engineering Athletes Ready for Season Victories

Lacrosse

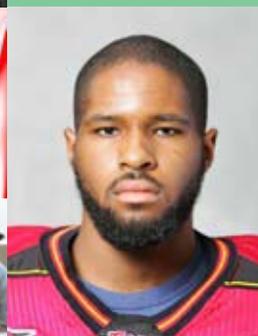
Senior defender and mechanical engineering undergrad **Ray Megill**, a two-time All-American, is pivotal to the Terps' lacrosse success this season. The 6-foot-1, 200-pound, Clark, N.J., native is one of the top defenders in the nation. Megill had the signature game of his career this spring in Maryland's 8-7 win at Navy in double-overtime. Megill is also among 17 players on the 2007 Tewaaraton Trophy nominee list announced by the Tewaaraton Award Foundation on April 18. Off the field Ray has been spending time working on the University of Maryland Human Powered Submarine Project and enjoys boating, dirt biking, snowboarding and fishing in his free time.



RAY MEGILL

Football

Mechanical engineering sophomore **Adam Kareem** is a second-year defensive back and a valuable member of the defensive scout team for the Terrapins football team. The DC native is interested in a career in automotive design and also exploring robotics as an academic focus.



ADAM KAREEM

Former Terps quarterback **Sam Hollenbach** signed with the Washington Redskins April 30 as a free agent. Earlier this year he was named the 2006 Maryland Player of the Year at the Annapolis Touchdown Club. Sam threw for over 2,300 yards and 15 touchdowns in 2006, and helped lead the Terps victory against Purdue in the Champs Sports Bowl 24-7, where he was also named MVP of the game. He finished his career at Maryland with 5,139 yards, ranking him fourth all time in passing yards behind Boomer Esiason, Scott Milanovich and Scott McBrien.



SAM HOLLENBACH

Young Terps

Jeb Brough (MS '06) and his wife, Kristina, had a son, John Edward Brough II on March 29, 2007.

Jungho, son of ME Research Associate Professor **Yunho Hwang**, will be entering Maryland in the Fall term as a Freshman after graduating from Centennial High School. He was accepted into the College Park Scholars Program and is majoring in Business. Yunho's daughter, Helen, is currently a doctoral student in the Department of Hearing and Speech Sciences at Maryland.

Administrative Office Assistant **Karen Lopez-Saravia** received her Associates Degree from Prince George's Community College in May, majoring in Criminal Justice. She has been accepted to Maryland for the Fall semester.

Montana, daughter of CEEE administrator **Lori Puente**, will be a Freshman enrolled in the Studio Art program at Maryland this Fall. She graduates from St. John's College High School in Washington, DC and will also be diving for the Terps Swim & Dive Team. Lori's son, Hudson, is currently a sophomore at Maryland.

Shannon, daughter of ME administrative staff member **Janet Woolery**, will be entering Maryland in the Fall term as a Freshman after graduating from Bowie High School. She was accepted into the University Honors Program and is enrolled in Letters & Sciences.



greatEXPECTATIONS

Contribute to the Department through the University of Maryland's Great Expectations campaign and support our mission to transform lives through exceptional educational and research opportunities. Your contributions can support ME initiatives such as graduate fellowships, undergraduate scholarships, and discretionary funds for professors. Please visit www.greatexpectations.umd.edu to learn more.

Gifts may also be made by check to "University of Maryland College Park Foundation (UMCPF)." Please designate "Mechanical Engineering" in the memo line, and mail to:

Avram Bar-Cohen, Professor and Chair
Department of Mechanical Engineering
2181B Glenn L. Martin Hall
University of Maryland
College Park, MD 20742

You can help make a difference with a gift of any amount!

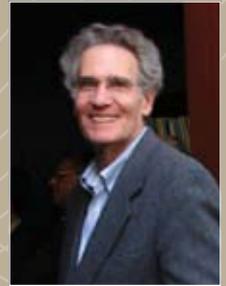
METRICS is published for alumni and friends of the Department of Mechanical Engineering at the A. James Clark School of Engineering.

Your alumni news and comments are welcome. Please send them to: Editor, Department of Mechanical Engineering, 2181 Glenn L. Martin Hall, College Park, MD, 20742. Visit our Web site at: www.enme.umd.edu

Department Chair: Dr. Avram Bar-Cohen
Chair's Assistant: Felicia Stephenson
Editor: Jim Barrett

Department Honors Edward B. Magrab

Professor Edward B. Magrab was honored for his service to the department at a May 15 faculty recognition service. University President and mechanical engineer Dr. C.D. Mote, Jr. was present to thank Magrab for his service to the University. Magrab joined the Department in 1987 as a joint appointment with MTECH, where he served as the Director of the Manufacturing Program. Ed spearheaded the department's substantial involvement in the then nascent MIPS program. Ed was an early contributor to the QUEST collaboration with the Smith School. In addition, Prof. Magrab developed ENME271 and ENME472, two of the enduring undergraduate courses in the department's curriculum. Ed's research and scholarly contributions have been in the fields of structural vibrations and computer integrated design and manufacturing.



MAGRAB

For more faculty news, see Page 4.



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