AROUND THE SCHOOL ONLINE EDITION

a supplement to *Pitt Engineer*, the alumni magazine of the University of Pittsburgh Swanson School of Engineering

Bioengineering

Savio Woo, University Professor of Bioengineering and professor of mechanical engineering, has received the Lifetime Achievement Award from the Bay Area Knee Society. Based in San Francisco, the society annually recognizes outstanding individuals who have made lifelong contributions in advancing the art and science of knee surgery. Woo is the 21st recipient of this prestigious, internationally recognized award that many consider to be the Nobel Prize of knee surgery.

William Federspiel, William Kepler Whiteford Professor in the Departments of Chemical and Petroleum Engineering and Bioengineering; **Sanjeev Shroff**, professor and Gerald McGinnis Chair; **Rory Cooper**, director of the Human Engineering Research Laboratories and bioengineering faculty member; and **William Wagner**, professor of surgery, chemical engineering, and bioengineering and deputy director of the University's McGowan Institute for Regenerative Medicine, have been elected to the Biomedical Engineering Society Fellows Class of 2007. Fellow status is awarded to society members who demonstrate exceptional achievement and bring experience to the field of biomedical engineering. Only six members were inducted this year.

Michael Sacks, William Kepler Whiteford Professor, has been elected to serve on the editorial board of the journal *Cardiovascular Pathology*, the official journal of the Society for Cardiovascular Pathology.

Cooper has received the 2007 da Vinci Lifetime Achievement Award from the National Multiple Sclerosis Society. The award honors his significant lifelong contributions to advancing accessibility.

Steven Abramowitch, research assistant professor, was invited to speak at several conferences, including the National Academies Keck Futures Initiative conference, in which only 100 researchers from across the nation were chosen to participate.

On behalf of the U.S. National Committee for Biomechanics, **David Vorp**, associate professor, was invited to participate in the Summit of Experts in Biomechanics in Keystone, Colo. The purpose of the meeting was to work on ways of identifying new pathways for biomechanics research and applications for the next 10 years. Vorp participated in the organ-specific mechanics subfield.

Department Code

- *Bioengineering (BioE)*
- *Chemical & Petroleum Engineering (ChE)*
- *Civil & Enviromental Engineering (CEE)*
- *Electrical & Computer Engineering (ECE)*
- *Industrial Engineering (IE)*
- *Mechanical Engineering & Materials Science (MEMS)*

Mark Gartner, adjunct lecturer, and **George Stetten**, associate professor, received Pitt Innovator Awards as part of the second annual Celebration of Innovation at the University of Pittsburgh.

Stephen Badylak's work in tissue engineering and wound healing was recognized as the Medical Breakthrough of the Year and listed among the 2007 Esquire 100, *Esquire* magazine's top 100 remarkable people, things, ideas, and places—large or small—that will make an impact on our culture in the months ahead.

Xinyan Tracy Cui, assistant professor, received funding for her National Science Foundation (NSF) grant application, "Electrically Controlled Neurochemical Delivery System."

Rakie Cham, assistant professor, received funding for her National Institute for Occupational Safety and Health RO1 grant application, "Biomechanics of Slips in Older Adults."

Chemical and Petroleum Engineering

Di Gao, assistant professor, received an NSF grant for "Design and Development of Super Water- and Oil-Repellent Surfaces by Topographic Manipulation." The outcome of this research will have practical significance in enabling technologies to make green construction materials such as self-cleaning windowpanes, anti-fog glass, and contamination-free surfaces. Gao also received an American Chemical Society Petroleum Research Fund grant for investigating the stability of interfacial films in crude oil emulsions by employing nanotechnology to assist in understanding the process of destabilization and breakdown of oil emulsions to remove water during the production of crude oil. His research was recently featured in *Nature Nanotechnology*.

Götz Veser, associate professor and CNG Faculty Fellow, received the R.A. Glenn Award from the Division of Fuel Chemistry of the American Chemical Society (ACS) for his

conference presentation "Nanocomposite Oxygen Carriers for Chemical Looping Combustion" at the 2006 ACS meeting in San Francisco, Calif. Coauthoring the presentation were his students, Tengfei Liu and Tom Sanders, and his collaborators at the National Energy Technology Laboratory (in Morgantown, W.Va.), Tom Simonyi and Ranjani Siriwardane.

James T. Cobb Jr., associate professor emeritus, attended the 2007 Annual Meeting of the National Council of Examiners for Engineering and Surveying (NCEES) as the personal representative of Larry Evans, president of the American Institute of Chemical Engineers (AIChE). He also took part in a workshop on emerging disciplines.

Shiao-Hung Chiang, professor emeritus, received the Lifetime Achievement Award at the American Filtration & Separations (AFS) Society 20th Anniversary Annual Conference and Exposition on March 27, 2007, in Orlando, Fla. Chiang, who has been active with AFS since 1988, is one of the nation's leading experts in fluid/particle processing and separation technologies and their applications to energy and environmental systems. He has published more than 150 papers; has chaired technical conferences and sessions; and has been a member of the AFS Board of Directors educational committee and publications committee.

Civil and Environmental Engineering

Julie Vandenbossche, assistant professor, is a member of the winning team awarded the R21 project Composite Pavement Systems, which is being funded by the National Academy of Science (NAS) Transportation Research Board Strategic Highway Research Program (SHRP). The objectives of this research are to investigate the design and construction of new composite pavement systems, not those resulting from the rehabilitation of existing pavements.

The research of **Amy Landis**, assistant professor, was highlighted in the August 1, 2007, issue of *Environmental Science & Technology* as both a news item and a feature article. Her novel research into the environmental implications of biobased production has shown that renewable bioproducts and biofuels can mitigate climate change but also exhibit seriously deleterious environmental trade-offs, including increased regional eutrophication and reduced air quality.

The Department of Civil and Environmental Engineering was front and center in its response to the August 1, 2007, collapse of the I-35W bridge in Minneapolis, Minn. **Kent Harries**, assistant professor and William Kepler Whiteford Faculty Fellow, was widely sought out by the media in response to this tragedy and the broader infrastructure crisis facing the nation. His expertise drew the attention of the Associated Press and Reuters, and his interviews were picked up from Wales to New Zealand. Harries conducted interviews for papers across the United States and Canada, and even for the *Tokyo Shimbun*. He appeared

Harries (above left)

on NPR's *All Things Considered* and KDKA-TV's *Sunday Report* with Al Biehler (BSCE '67), the Pennsylvania secretary of transportation. The U.S. Senate homeland security committee later consulted Harries on the issue of deteriorating infrastructure.

Harries is the author of 52 journal articles, 44 peer-reviewed conference articles, and more than 100 technical reports. His primary research is in the application of fiber-reinforced polymer (FRP) materials for structural repair and retrofit. He also is well known for his work in the seismic design of high-rise coupled wall structures. Recently, Harries has been involved in issues of hazard mitigation using indigenous materials, and he will travel to India in May 2008 for this work.

Xu Liang, associate professor, has been awarded an NSF grant for her collaborative/parallel research on sensor and wireless sensor networks for environmental monitoring.

Rafael G. Quimpo, professor, presented an invited paper at the Fourth International Conference on Sustainable Water Resources Management in Kos, Greece. His paper, "Hydrologic Modeling Support for Sustainable Water Resources Management," was published in *Water Resources Management IV* (C.A. Brebbia and A.G. Kungolos, eds). Quimpo also was a member of the conference's International Scientific Advisory Committee. Additionally, he presented an invited paper at the American Society of Civil Engineers Environmental and Water Resources Institute (ASCE-EWRI) joint conference in New Delhi, India, and gave a keynote address at the ASCE International Conference on Water Resources in Mumbai, India.

Piervincenzo Rizzo, assistant professor, received the 2007 American Society for Nondestructive Testing (ASNT) Faculty Grant Award at the ASNT Fall Conference and Quality Testing Show in Las Vegas, Nev. The award recognizes the development or revision of nondestructive testing and evaluation courses at the academic level. Rizzo will use the support to develop a course in nondestructive evaluation for School of Engineering students.

Janet E. Stout, research associate professor, was invited to speak on the topic of waterborne pathogens at the June meetings of the American Industrial Hygiene Association (AIHA) and the Association of Professionals in Infection Control. She also participated in a professional development course at the AIHA meeting.

Electrical and Computer Engineering

Zhi-Hong Mao, assistant professor, was awarded a three-year $195,000 NSF grant for "Dimensionality Reduction in the Control of the Human Hand." Coprincipal investigators are Assistant Professor **Heung-No Lee** and Professor **Mingui Sun**.

Mao's research aims to promote the understanding of neural organization and mechanism for the dimensionality reduction in the control of hand movements. Study in this direction will be valuable for the design of dexterous robots, brain-like circuits, and brain-machine interfaces, with a variety of potential applications in industry, defense, and medicine—for example, in developing prosthetics that may aid stroke victims, handicapped individuals, and those with brain or spinal cord damage. Furthermore, inspired by the neural principles for handling problems of high dimensionality, this research will provide insights into the control of large-scale engineering systems.

Steven Levitan, John A. Jurenko Professor, has been appointed an Oliver Smithies Lecturer and a visiting fellow of Balliol College at the University of Oxford in England. Additionally, Levitan received the Association for Computer Machinery (ACM) Recognition of Service Award in appreciation for his contributions as general chair of the 44th Design Automation Conference (DAC).

Alex Jones, assistant professor, has received two new grants. NSF has awarded him $325,000 for the next three years to investigate the use of circuit switching as an efficient alternative to packet and wormhole switching

Levitan

Redfern

for achieving high-bandwidth, low-latency communication in high-performance parallel systems. An 18-month grant from the Technology Collaborative, in the amount of $298,070, is to create a new, reconfigurable SuperCISC Fabric and C-based design flow that provides the performance of custom hardware acceleration with ultra-low-power consumption that can be programmed from C code.

Additionally, Jones was awarded the Pitt Innovator Award, has been named coeditor of a special issue of *Parallel Processing Letters* related to the Workshop of Large-scale Parallel Processing (for which he will be on the steering committee and serve as publicity chair), and has been invited to be the publicity chair for the DAC PhD Forum in 2008.

Patrick Loughlin, professor, was awarded funding by the National Institute of Aging (NIA) for an RO1 grant application. (Coinvestigators are J.M. Furman, J.R. Jennings, **Mark Redfern**, and P.J. Sparto.) Pilot funding for this research came from the NIA-funded Pittsburgh Claude D. Pepper Older Americans Independence Center. The project is titled Modeling Sensory Integration and Attention in Postural Control of Older Adults.

Kevin Chen, assistant professor and Paul E. Lego Faculty Fellow, was awarded a prestigious NSF Faculty Early Career Development (CAREER) award. He also received

research funding from NSF, and—along with **Joel Falk**, professor—funding from the National Energy Technology Laboratory (NETL).

Jun Yang, assistant professor, has received her third NSF research grant. The current grant is in conjunction with Youtao Zhang of the Department of Computer Science in the School of Arts and Sciences and is to research achieving energy-efficient code dissemination.

Industrial Engineering

Lisa Maillart, assistant professor, has been awarded an NSF grant for $320,000 for three years to work on a project titled Optimal Management of Expedited Placement Livers.

Karen Bursic, assistant professor, has been named director of the Department of Industrial Engineering undergraduate programs.

Kim LaScola Needy, associate professor, and **Robert Ries**, assistant professor of civil and environmental engineering, were awarded a two-year research grant from the Construction Industry Institute (CII) to study quality management in the capital facilities delivery industry. CII, based at the University of Texas at Austin, is a consortium of more than 100 leading owner, engineering contractor, and supplier firms from both the public and private arenas. These organizations have joined together to enhance the business effectiveness and sustainability of the capital facility life cycle through CII research, related initiatives, and industry alliances.

Needy; **Bryan A. Norman**, associate professor; and **Brady Hunsaker**, assistant professor, have received a two-year research grant of $100,000 from NSF. The grant for supply chain design comes through the Industry/University Cooperative Research Centers (I/UCRC) and the TIE research program on e-design. This program funds cross-cutting research across I/UCRC and will be worked on collaboratively by the Center for e-Design at Pitt and faculty from the Center for Engineering Logistics and Distribution at the University of Arkansas and Oklahoma State University. This research addresses how to effectively synchronize product design and supply chain design for new and existing products, resulting in not only a good product design but also a supply chain that is cost-effective, minimizes lead time, and ensures quality.

Mechanical Engineering and Materials Science

Lisa Weiland, assistant professor, is a principal investigator (PI) or co-PI on six current grants, including grants from NETL, the Defense Advanced Research Projects Agency (DARPA), the Heinz Foundation, and NSF.

Anne M. Robertson, associate professor, gave three invited talks and one keynote lecture on her research on cerebral aneurysms at three international conferences. She was one of two invited speakers at the 9th International Symposium on Future Medical Engineering Based on Bio-nanotechnology (part of Tohoku University's 21st Century Center of Excellence Program), held in Sendai, Japan. Her second invited lecture was presented at the Joint Meeting of the European Society of Neuroradiology and the Intracranial Stent Meeting in Geneva, Switzerland. The third invited talk was at the International Conference on Mathematical Fluid Mechanics, held in honor of William Kepler Whiteford Professor **Giovanni Paolo Galdi**. She presented three podium talks on cerebral aneurysm research, including her keynote lecture at the 5th World Congress of Biomechanics in Munich, Germany. Additionally, with support from a Hewlett International Faculty Grant, Robertson served as a visiting professor at the Politecnico di Milano in Milan, Italy.

Sung Kwon Cho, assistant professor, received an NSF grant of $160,000 for three years for the development of an integrated microsystem for ultrasensitive airborne pathogen detection in real time. Cho serves as the lead principal investigator in collaboration with Jeff T. Wang at Johns Hopkins University. His recent work on in-droplet particle separation with his student, Yuejun Zhao and Chang-Jin Kim from the University of California, Los Angeles, was recognized as an application highlight in *Chemical Technology* and *Chemistry World* magazines. Cho was invited to the NSF Workshop for Frontiers in Transport Phenomena Research and Education and made a presentation on issues in microfluidics (droplets and bubbles).

Peyman Givi, William Kepler Whiteford Professor, was named 2007 Engineer of the Year by the American Society of Mechanical Engineers (ASME). Givi gave three invited lectures this past year: one at the national meeting of ASME; one at the annual American Institute of Aeronautics and Astronautics (AIAA) meeting; and one at the Third International Symposium on Non-equilibrium Processes, Plasma, Combustion, and Atmospheric Phenomena (NEPCAP), held in Sochi, Russia. Additionally, he established an AIAA student chapter at Pitt and serves as its faculty advisor. Further, he has established a joint PhD program with Al-Faraby University in Kazakhstan, where he has taught a short course. Givi has been elected a fellow of the American Physical Society (APS), with the citation "For pioneering computational research on turbulent reactive flows, and especially for the development of the filtered density function methodology."

The Arthroscopy Association of North America (AANA) has recognized collaborative research between the Department of Mechanical Engineering and Materials Science (MEMS) and the Department of Orthopaedic Surgery with the 2007 Resident/Fellow Scholarship Award in the category of basic science. The award-winning paper was titled "Tibiofemoral Contact Area and Pressure in Single- and Double-bundle ACL Reconstruction." It looked at changes that occur in the contact pressure in the knee with different anterior cruciate ligament (ACL) reconstruction methods. This research has implications for the

occurrence of long-term osteoarthritis in patients with ACL reconstruction. Two of the paper's authors—**Freddie Fu** and **Patrick Smolinski**—hold joint appointments in MEMS and the Department of Orthopaedic Surgery. They received the award at the 2007 AANA conference in Whistler, British Columbia.

During the first week of October 2007, in conjunction with Pitt's Joseph M. Katz Graduate School of Business Executive MBA (EMBA) Worldwide Program and the U.S. Business School Prague, **Gregory Reed**, adjunct professor, delivered two energy-related elective courses through the Pitt School of Engineering and KEMA Inc. to executives and managers of the Czech Energy Group (CEZ) and others in Prague, Czech Republic. Reed's main objectives in teaching the two courses were to provide the EMBA Prague students with an in-depth, industry-based overview and analysis of international utility business strategies and operating practices, as well as to offer a global treatment on various aspects and issues related to energy resources and energy production. Reed, who is senior vice president of KEMA Inc, taught the courses with James Baumstark, retired U.S. Navy captain and retired vice president of central engineering, Consolidated Edison Co. of NY Inc.

Research Centers, Institutes, and Schoolwide News

Two School of Engineering graduate programs were ranked nationally among the top 15 public universities in the 2008 *U.S. News & World Report* graduate program rankings. The Department of Bioengineering was ranked sixth among public universities for the second year in a row, and the Department of Industrial Engineering was ranked 12th, up from 14th last year. Overall, the school was ranked 28th for graduate education among public schools (up from 32nd last year) and 50th overall (up from 54th last year). In public engineering schools with undergraduate enrollments of 2,500 or less, Pitt placed third.

The Department of Civil and Environmental Engineering (CEE) has strategically positioned itself to focus its research and educational efforts on the transportation sector by creating the new **Center for Sustainable Transportation Infrastructure** (CSTI). CSTI was formed to expand on the successful research and education collaboration between the Pennsylvania Department of Transportation (PennDOT) and CEE. Prior to this, PennDOT and the University of Pittsburgh formalized their relationship through an intergovernmental agreement, which provides a mechanism to support CSTI activities with up to $25 million over five years.

Codirectors **Radisav Vidic**, professor and department chair, and **Melissa Bilec**, visiting research assistant professor, are spearheading the center's vision and operations to advance the state of transportation infrastructure through collaborative, multidisciplinary research and education efforts and dissemination of new technologies and knowledge. Bilec has field experience in sustainable transportation projects, including the Hot Metal Pedestrian Bridge project (see photo below).

The **Manufacturing Assistance Center** served as technical advisor to Plum Senior High School in Plum, Pa., for BattleBots (now BotsIQ). BotsIQ is an educational program created by the producers of the *BattleBots* television series in which homemade, remote-controlled robots compete against each other. In 2001, they started a national competition in which students showcase their custom-built robots and compete for top honors. Plum won the local competition in March and continued to the national competition in Florida.

Bilec