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College of Engineering/Pete Brown

No Pressure—Walter Seaman (left) and Matthew Leavy scrutinize their test apparatus, which they and their teammates designed to test how equipment seals withstand a simulated lunar environment.

Sponsors Award \$10,000 in Prizes at Engineering Design Day 2009

Senior capstone project sponsors awarded more than \$10,000 in prizes for senior engineering projects presented at Engineering Design Day 2009.

This year's Design Day was held May 5 in the Student Union Memorial Center's Grand Ballroom, and drew a crowd of about 800. Lockheed Martin and BAE Systems sponsored the event.

"Design Day is the end of a year-long experience that involved students working on real problems with real clients," said Jeff Goldberg, dean of the College of Engineering. "The program gives engineering students

a chance to apply four years of engineering education to a project that has real benefit."

"It's an exciting time that validates all the work we have done with the students during the preceding four years," Goldberg added. "What I like about it is that it's a warm-up. These students are about to go out into industry and do this for real. It massively increases their chances of being successful in the next project."

The UA student projects covered a wide range of engineering disciplines related to, among other things, space exploration

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You Win Some, You Lose Some

This will be a year of progress and growth for the College of Engineering, despite some grim budgetary and personal news

In this issue of *Arizona Engineer* you will get an impression of the amount of change and successful projects under way in the College of Engineering. That change includes building the best team possible to further our research and teaching missions. We have added

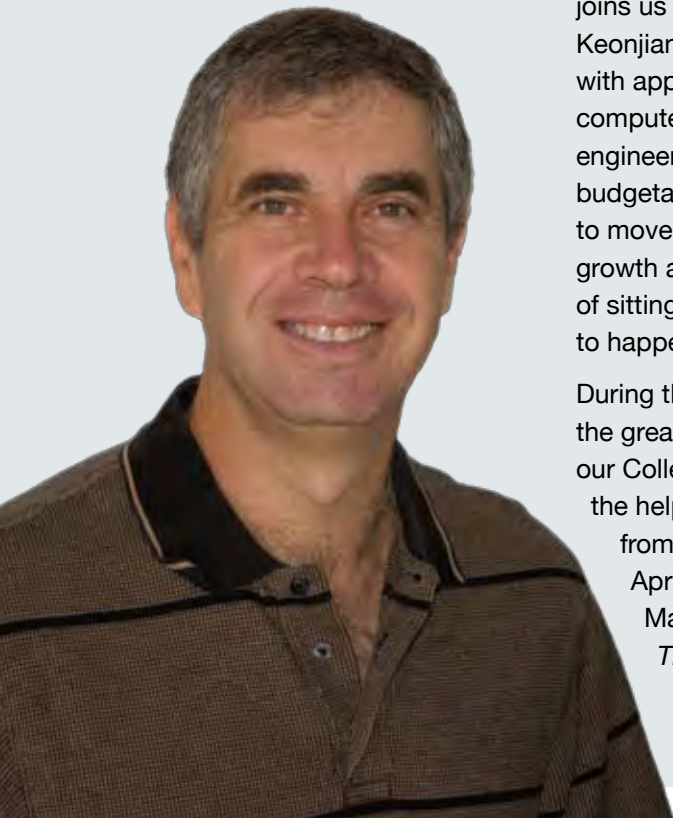
Glenn Schrader as associate dean for research, Pierre Deymier as director of the School of Sustainable Engineered Systems, and Jeff Jacobs as head of aerospace and mechanical engineering. We have created a biomedical engineering department, headed by Jennifer Barton, and Wolfgang Fink joins us as the Edward and Maria Keonjian distinguished professor, with appointments in electrical and computer engineering and biomedical engineering. Even in these times of budgetary difficulty, the College has to move forward and look for areas of growth and investment. I am not a fan of sitting around and waiting for things to happen.

During the past five months, I have had the great pleasure of meeting many of our College partners and I value highly the help and advice I have received from people all over Arizona. In April one of our best friends, Lee Matsch, suggested that I read *The Contrarian's Guide to Leadership*, the outstanding book by Steven Sample,

president of the University of Southern California. Lee was quick to help the College and me whenever he could and his family set up a scholarship fund to honor his father. Sadly, Lee passed away in July. He is sorely missed and I would like to offer our heartfelt condolences to his family.

Sad news aside, we are off to a great start this year. Our freshman class is 10 percent larger than last year, and student quality and diversity are both up. We now give out more than \$600,000 in donor-funded student scholarships annually. On the research side, our award total for the first quarter was \$11 million, double the amount for the first quarter of 2008. Our faculty, staff, and students are all working hard to be successful. It is imperative that we are successful because the College is critical to much needed economic development in Arizona and the nation.

Bear Down!



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Many stories in this print edition have been edited for length, and it is not feasible to include related multimedia material such as video and audio files, and hyperlinks to related Web sites.

 To get the full story, look for the story number by the **Ae** icon embedded in the article, then go to the online edition and enter the story number in the search box.



Courtesy of Young-Jun Son

Three Cheers—Associate professor Young-Jun Son (center), and PhD students Seungho Lee (left) and Nurcin Celik celebrate their awards at a reception at the IIE Conference and Expo in Miami.

Industrial Strength

Associate Professor Young-Jun Son and two of his students, **Seungho Lee and Nurcin Celik**, all of the department of systems and industrial engineering, won three awards June 1 at the 2009 Annual Conference and Expo of the Institute of Industrial Engineers in Miami.

Son and PhD candidate Seungho Lee took the best paper award in the area of modeling and simulation, for their paper titled Dynamic Learning in Human Decision Behavior under the Extended Belief-Desire-Intention Framework.

Doctoral student Nurcin Celik, whom Young-Jun advises, received the best master's thesis award for her thesis titled Dynamic-Data-Driven Adaptive Multi-Scale Simulation (DDDAMS) for Planning and Control of Distributed Manufacturing Enterprises. Celik also won best PhD scientific poster award in the conference's PhD colloquium.

"Receiving prestigious awards and being recognized by our major society is truly exciting and encouraging," Son said. "This is great motivation for our team to keep up the good work."

Son's group has been applying behavior-modeling techniques to attempt to predict how people react to disasters, such as a bomb exploding on a city street. The group created the city area affected by the explosion in a virtual reality environment, and human subjects donned VR goggles and hit the virtual city streets in the aftermath of the blast.

Researchers then watched how the subjects reacted to virtual smoke pouring out of buildings, emergency vehicles hurtling by with sirens blaring, panicked crowds rushing toward them, helicopters buzzing overhead, and dozens of other disorienting stimuli. These observations were then incorporated into intelligent evacuation management software programs.



College of Engineering/Pete Brown

Pool Player—Mechanical engineering senior Justine Schluntz at Engineering Design Day 2009.

Engineering Honors Senior Wins Robie Gold Medal

Engineer and competitive swimmer Justine Schluntz, who graduated summa cum laude

with honors with a bachelor's degree in mechanical engineering, won a Robie Gold Medal Award in 2009. The medal and cash award were founded by UA graduates Wendell Robie of the class of 1917 and Inez Robie of the class of 1916. The awards are given each year to one male and one female student who show personal integrity, initiative, cooperativeness, enthusiasm, humility, well-rounded interests, active participation in student affairs, service to the University and willingness to give more than required, and show a love of God and country. Schluntz will be a research assistant with professor Jeff Jacobs, studying experimental fluid dynamics. In addition, she is looking forward to representing the Wildcats in the pool for one more year.



Seungho Lee and Nurcin Celik, all



with honors with a bachelor's degree in mechanical

Glenn Schrader is New Associate Research Dean



Glenn Schrader

Professor Glenn L. Schrader, who has been head of the department of chemical and environmental engineering since he joined UA in

2006, is the College of Engineering's new associate dean for research.

Before joining UA, Schrader spent more than 25 years on the faculty of the department of chemical engineering at Iowa State University, where he became a professor in 1984. He returned to his undergraduate alma mater in 1980 after a period as an associate professor at the University of Delaware, where he began his academic career.

Schrader received his doctorate from the University of Wisconsin in 1976. He has been named an honorary faculty member at the University of Queensland and has spent sabbaticals as a royal fellow at the Norwegian Institute for Technology in Trondheim, Norway, and as an Australian Research Council fellow at the University of Sydney.

The primary role of the dean of research is the acquisition of research funding and development of the strategic research portfolio of the College of Engineering. "Glenn will go out and sell the research portfolio of the College," said Jeff Goldberg, dean of the College of Engineering. "He knows our strengths, and he will make matches between potential funding sources and our faculty and research teams."

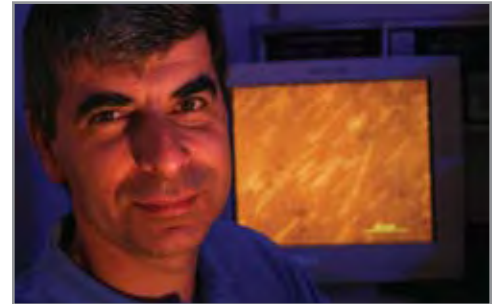
Deymier Accepts Position as Head of New School of Sustainable Engineered Systems

Professor Pierre Deymier is the new director of the recently established School of Sustainable Engineered Systems, or SSES.

SSES unites the departments of chemical and environmental engineering, civil engineering and engineering mechanics, materials science and engineering, mining and geological engineering, and systems and industrial engineering.

Deymier has been associate head of the department of materials science and engineering since 2001, and is on the faculty of the BIO5 Institute, the applied mathematics graduate interdisciplinary program, and the biomedical engineering program. He joined the department of materials science and engineering in 1985 as an assistant professor, becoming associate professor in 1991 and full professor in 1997.

"I am honored to have been chosen to serve the recently formed School of Sustainable Engineered Systems as its first director," Deymier said. "This



Pierre Deymier

is a unique opportunity to establish a center of excellence in interdisciplinary research and education in the College of Engineering."

Deymier has research collaborators across the UA campus as well as national and international partners, and he intends to bring that local to international scope to the new school. "With the help of the SSES leadership, faculty, staff and students, I hope to bring to life a locally, nationally and internationally recognized school," he said.

"I want this school to gain a reputation that is rooted in excellence in research, scholarship and education," Deymier said.

What is SSES?

SSES will bring together more than 50 faculty members from five engineering departments and draw on expertise throughout the campus.

It will focus on critical linkages between systems in infrastructure, resources, energy and environment. SSES will address the broad range of opportunities and problems arising in the Southwest due to:

- The abundance of solar energy that could reduce the cost of imported energy.

- A shortage in potable water that could limit population growth, deter economic expansion, and threaten public health and safety.
- Environmental degradation, such as the increasing levels of groundwater salinity.
- The existence of a strong, but threatened, high-tech manufacturing industry based primarily on semiconductor devices.
- Rapid growth and development resulting in a need for new transportation, water and power infrastructure.

Small Plane, Big Win

The Micro Air Vehicle Club took second place in overall performance and first place in indoor flight performance in the 4th International Micro Air Vehicle Competition, June 1-5 in Pensacola, Fla.

“Our team demonstrated outstanding performance,” said Sergey Shkarayev, the student team’s faculty advisor and an associate professor in the department of aerospace and mechanical engineering.

Teams from the U.S., Germany, France and Australia entered designs into the competition, in which the miniature aircraft had to land on small raised platforms, navigate through buildings to identify targets, survive gusting winds, and demonstrate superior endurance. The University of Arizona vehicle is unique because it can fly horizontally like a normal airplane and also transition



College of Engineering/Pete Brown

to a hovering mode for maneuvering in tight places. This makes the vehicle very adaptable, and capable of performing well in a different environments.

Thanks to this innovative design, the UA was the only team able to use the same vehicle for all the competitions different challenges. “The team successfully completed all of the missions and the

vehicle drew a lot of attention from other teams,” said Shkarayev.

Outdoor missions pushed the limits of autonomous flight, requiring the MAVs to fly to specified GPS coordinates, land at precise locations, and even follow vehicles by camera. The indoor missions tested the maneuverability and hardiness of the designs.

Hands-On—MAV team member Nick Mindock keeps a close eye on a MAV during a demonstration in the team’s lab in the department of aerospace and mechanical engineering.

Baja Racing Gains Strength

UA Baja Racing scored a record number of points in the Baja SAE Wisconsin competition, held June 11-14, 2009, at a test facility run by engineering firm MGA in Burlington, Wis.

UA Baja Racing develops a prototype vehicle every year and competes in the Baja SAE Collegiate Design Series every summer. Teams must design, build, market and race a single-seat off-road vehicle while generating financial support for their vehicles and maintaining educational priorities.

“This was the first year that our team has ever attended the Midwest competition, which is known as the most difficult of the three regional competitions,” said UA Baja Racing team leader Andrew Smock. “We scored the most points in our team’s history, and placed 33rd out of 120 entrants.”

Were it not for a misunderstanding during the endurance race, Smock thinks the UA team would have placed much higher. “We would have been 11th or 12th if the course workers had not accidentally towed our car to the pits during the endurance race,” he said. The mix-up occurred after another vehicle T-boned the UA vehicle off the course and flipped it over.



Courtesy of UA Baja Racing

Air Time—The UA Baja Racing car grabs some air at the Baja SAE Wisconsin competition, June 11-14, 2009.

“Normally, you would get flipped back over, checked for frame damage, and sent on your way,” Smock said. “Instead, course workers were told that our vehicle was disabled and we ended up losing 40 minutes in the endurance race.” According to Smock, 40 minutes equates to about 8 laps, which was the distance between the UA vehicle and the race leaders.

“It was a tough break,” said Smock. “But we will learn from our mistakes this year and put up even better numbers next year.”

Staff, Faculty and Students Win Awards for Excellence

Staff, faculty and students at the College of Engineering won three Science & Engineering Excellence awards.

The SEE awards recognize individuals and organizations at the University of Arizona



who have exhibited an outstanding commitment to increasing diversity and inclusiveness in science, technology, engineering and math.

College winners were the Engineering Ambassadors, who are organized by Susie Bowers, assistant director for recruiting and outreach; professor Supapan Seraphin of the department of materials science and engineering, and Ray Umashankar, director of the multicultural engineering program.



A Boy and His Robot

Ray Umashankar runs the Summer Engineering Academy and the Summer Engineering Robotics Camp. He believes that creating enthusiasm for math and

engineering is important when students are in middle school because that's when many students lose interest in technical subjects.

Engineering Ambassadors volunteer their time to support recruiting and outreach among middle and high school students. About 60 percent are from groups that are underrepresented in engineering: women, Hispanics, African-Americans and Native Americans.

Professor Supapan Seraphin is widely known for the weekly Thai-food lunch she prepares for undergraduate students, as well as for her student mentoring programs. Each summer she leads a group of students and teachers on a study program at King Mongkut's University of Technology in Thailand.



College of Engineering/Pete Brown

Rock Star—Ros Hill, director of the San Xavier Mining Laboratory, outside Old Main. The rock has been used by mining engineering students for drilling competitions and is about to be replaced ready for the next round of drilling.

Head of San Xavier Mine Lab Wins International Mine Safety Award

Ros Hill, director of the San Xavier Mining Laboratory, has been



awarded the H. L. Boling Above and Beyond Safety Award by the International Society of Mine Safety Professionals.

Hill received the award—on behalf of the UA, the department of mining and geological engineering and the College of Public Health—at the society's Critical Issues Conference in Daytona Beach, Fla., in May.

The award is named for H.L. Boling, a founder of the International Society of Mine Safety Professionals and its executive director and awards chairman.

"To me the award is significant because it is recognition by my peers of what we have been able to do in the department, which is move toward our goal of graduating the safest mining engineers and

designing the safest mines in the world," Hill said. "It is recognition by our peers that we have a world-class mining engineering program where safe production is the only acceptable alternative."

Hill currently directs miner health and safety programs, teaches classes in mining health and safety, and directs the San Xavier Mining Laboratory. He says his goal is "to graduate the safest mining engineers designing the safest mines in the world."

When students graduate, they are recognized for their practical leadership skills in a very difficult work environment. "One of our mine co-managers is graduating this year," Hill said, "and has been offered an initial leadership role in a major mining company with starting pay between \$85,000 and \$90,000."

Fasel is First 1885 Society Presidential Chair

University of Arizona President Robert N. Shelton has appointed professor Hermann F. Fasel as the first 1885 Society Presidential Chair.

Fasel has been a professor in AME since 1982, and heads the Computational Fluid



Dynamics Laboratory in that department. The newly created Presidential Chair is the first initiative to be funded by the 1885 Society, a UA donor group committed to providing annual cash gifts of \$10,000 or more that enable Shelton to respond to UA's changing needs.

"The generous gifts from members of the 1885 Society allow us to leverage our

resources to reward faculty members during these challenging times," Shelton said, and described Fasel as "precisely the type of faculty member who embodies UA's reputation as a world-class research institution."

"Hermann is an outstanding College of Engineering faculty member in all phases of the job—teaching, research and service," said Jeff Goldberg, dean of the College of Engineering.

"He works on problems that are important to society and he has a great ability to show how things are interrelated. He has high standards for himself and his colleagues, which is



Hermann Fasel

why he is so well respected around the world."

As chair holder, Fasel will receive \$40,000 annually. Fasel plans to use the unrestricted funding for exploratory research in alternative energy and biomedical fluid mechanics.

"I was totally surprised and I am deeply honored to be selected for this prestigious award," Fasel said. "I see this as an investment in new ideas."

Rozenblit Appointed University Distinguished Professor

Professor Jerzy Rozenblit has been appointed University Distinguished Professor, an honor that recognizes faculty who have shown a long-term commitment to undergraduate education and have made outstanding contributions at the University of Arizona.

Rozenblit holds the Raymond J. Oglethorpe endowed chair and is head of ECE. He also holds a joint appointment in the department of surgery.

Rozenblit's research and reputation are internationally known and respected. He is considered a founding figure in the engineering of computer-based systems, and his work cuts across the boundaries of many disciplines, including surgery, anthropology, and theatre arts.

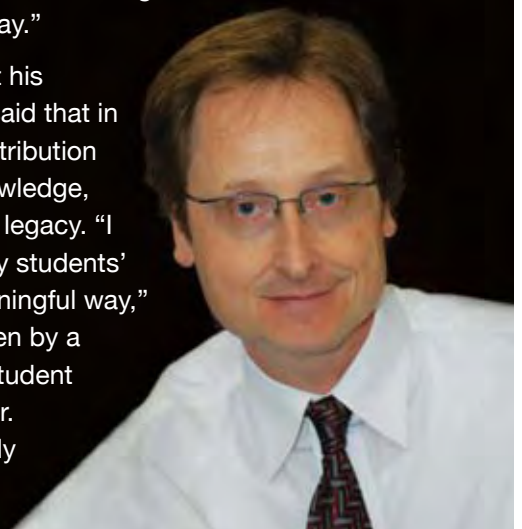
His great passion, though, is teaching. During his 23 years at UA, he estimates that he has taught almost 5,000 undergraduate engineers. "It's very rewarding," he said. "I think this award reflects the commitment that I have and joy that I take from interacting with young minds, with the brightest and the best." Fittingly, he has been selected by his students to receive three teaching awards.

Rozenblit has provided scholarships for several disadvantaged students who have subsequently excelled in the ECE program. He established the Raymond J.

Oglethorpe Undergraduate Fellowship in Computer Technologies in Clinical and Academic Medicine using funds from his endowed chair position.

College of Engineering Dean Jeff Goldberg said of Rozenblit: "Jerzy fits the mold of the renaissance professor. He has established a link between fine arts and electrical engineering, and is doing work in technical theater. He also has a link with surgery that has resulted in a teaching system for surgeons based around a robotic simulator. His whole career has focused on how to combine research and teaching in a really effective way."

When asked about his legacy, Rozenblit said that in addition to his contribution to the body of knowledge, there is a personal legacy. "I have influenced my students' lives in a very meaningful way," he said. "I am driven by a desire to see the student become the master. That is an incredibly rewarding feeling."



Engineering Design Day 2009

CONTINUED FROM PAGE 1

and imaging, defense applications, unmanned aerial vehicles, solar power projects and robotics. Event judges were practicing engineers from companies throughout the country who reviewed the presentations and demonstrations.

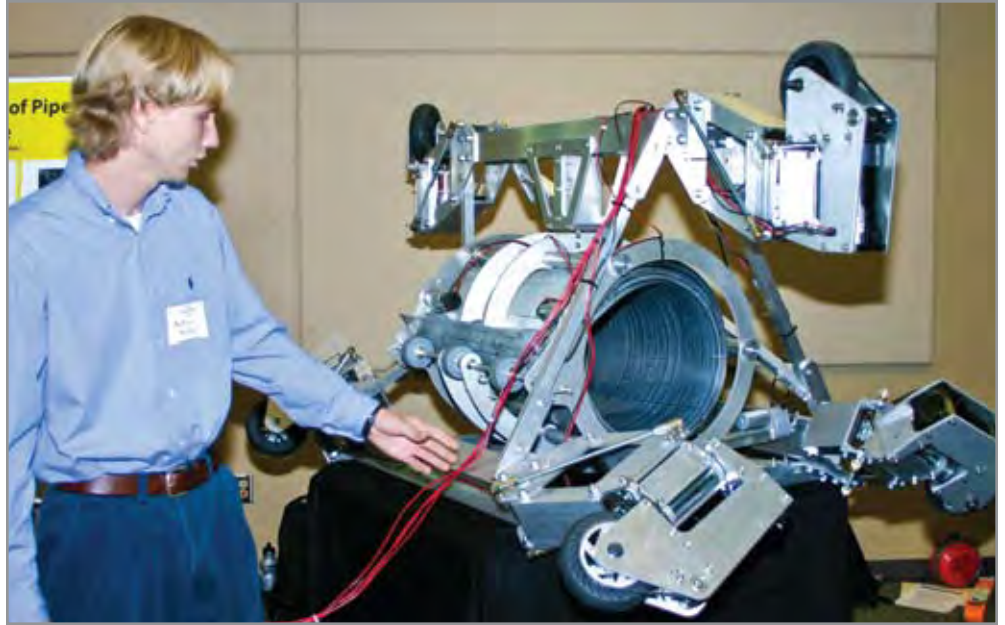
One telemetry project created wireless sensors for firefighters at the scene of an emergency. The sensors measure temperature, oxygen and carbon monoxide levels in the firefighter's immediate surroundings. Firefighters wear a small transceiver that constantly transmits data from the sensors to a central base station monitored by the fire chief at a safe distance from the scene. The system sounds an alarm when certain critical readings are recorded and informs the chief which firefighters tripped the alarm.

Other students demonstrated a motorboat propulsion system outside on the north side of the building. These motors were designed to be suitable for commercial river operations inside



College of Engineering/Pete Brown

Plane Sight—Justin Novacek and Regina Reed were part of a team that designed and built a radio-controlled plane to compete in the AIAA Design/Build/Fly competition.



College of Engineering/Pete Brown

Put That in Your Pipe—Matthew Mokler demonstrates a robot that applies carbon laminate spirally inside concrete pipes to reinforce them.

Grand Canyon and Glen Canyon national parks. The river outfitters associations who run concessions in the parks sponsored the projects.

The Grand Canyon sponsors specified that the propulsion system should use non-fossil fuel to minimize emissions, be able to run for at least 300 miles and have enough power to replace

the 30-horsepower engines currently in use. The sponsor also specified that the system should be durable, quiet, self-contained and transferable between different watercraft.

Another biomonitoring project has the potential to alert drivers—long-distance truck drivers, for example—just before they fall asleep at the wheel. The comfortable, battery-operated device sends out a wireless signal to activate an alarm when it registers brain wave activity associated with the onset of sleep.

Another group developed an affordable solar- or battery-powered water and milk purifying system that uses ultraviolet light to kill pathogens. The purifier has huge potential for reducing disease in such places as rural Africa. The project was sponsored by Meridian Design and attracted funding from the Bill and Melinda Gates Foundation. Prototypes of the design were tested in Africa this summer.

Completing a Senior Capstone Project as a team is a graduation requirement for most UA engineering students and the showcase was their chance to present

the college's expertise in areas such as biomonitoring and in environmental and sustainable engineered systems.

The senior capstone program gives students experience working on real-world design projects that involve budgets, reviews and deadlines. Many of the projects go on to yield patented commercial products.

The projects are sponsored and funded by faculty and industry partners such as Lockheed Martin, Ventana Medical Systems, BAE Systems, Raytheon, Texas Instruments, Edmund Optics and Honeywell. The companies also sponsor prizes and provide some of the many professional engineers who serve as judges.

"This design process requires that the teams thoroughly understand the requirements of the customer and that they design working prototypes that meet both the technical and functional requirements for their design," said Martha Ostheimer, program director for the Interdisciplinary Engineering Design Program.

"As part of the College's design experience, students also become familiar with project management skills," Ostheimer said. That includes learning "how to bring the project in on time and within budget, and using the oral and written skills required to successfully communicate their design process and results to a diverse audience of technical and nontechnical people," she said.



College of Engineering/Pete Brown

Bring the Noise—Leslie Wu tweaks the equipment that she and her team designed for a project on stochastic resonance.

And the Winners Were...

Best Overall Design • \$1500

Dynamically scaled oblique flying wing

Design team: Joseph Farrell, Andrew Levine, Isaac Mavis, Brandon Napier, Michael Perillo, Daniel Wibben

Project sponsor: Professor Herman Fasel

Prize sponsors: Lockheed Martin and BAE Systems

Best Overall Design, Runner Up • \$1000

Multiscale biaxial optomechanical device

Design team: Hosain Bagheri, Alexandru Dospinoiu, Adoum Mahamat, Jacob Rader, Daniel Wu

Project sponsor: Soft Tissue Biomechanics Laboratory

Prize sponsors: Lockheed Martin and BAE Systems

Best Analog Design, First Place • \$1500

Brain wave activity alarm

Design team: Amjad Chatila, Jason VanAsdlan, Manny Fimbres, Henry Barrow, Joseph Bitz, McKay Crowder

Project sponsor: Texas Instruments

Prize sponsor: Texas Instruments

Best Analog Design, Second Place • \$500

Telemetry system prototype

Design team: Stephanie McKeefery, Michelle Ho, Joseph Caglio, Chi Hou Chio, Sandip Uprety, Jae Hyok Goh

Project sponsor: Department of Electrical and Computer Engineering

Prize sponsor: Texas Instruments

Best Innovation in Engineering • \$1000

Adiabatic cell using low reagent volumes

Design team: Tanner Wall, Melissa Bui, Ravneet Chadha, Erica Liebmann

Project sponsor: Ventana Medical Systems

Prize sponsor: Ventana Medical Systems

Best Engineering Analysis • \$750

Portable gluten biosensor

Design team: Kevin Miller, James Nimlos, Jeremy Williams

Project sponsor: Agricultural & Biosystems Engineering

Prize sponsor: Raytheon Missile Systems

Best Presentation • \$750

PedOne: pediatric electronic medical records

Design team: Erin Prenger, Michael Schreiber, Joseph Wahl

Project sponsor: Seventh Rank Management

Prize sponsor: Rincon Research

Best Technical Documentation • \$750

Mechatronic medical device deployment system

Design team: Jeremy Coleman, Ehude Bezalel, Alejandro Covarrubias, Andrew Pyzdek, Joshua Grosman, Matthew Weiner

Project sponsor: W. L. Gore & Associates

Prize sponsor: Technical Documentation Consultants of Arizona

Best Use of Off-the-Shelf Components • \$750

Leave-behind remote sensor

Design team: Mark Brodie, Megan Whitney,

Ross Miller, Brian Adelson, Kyle Van Renterghem

Project sponsor: Raytheon Missile Systems

Prize sponsor: Edmund Optics

Best Use of Prototyping • \$750

Irrigation flowstream energy extraction and storage via turbine

Design team: John Saenz, Chris Sandy, Juan Lopez, Carlos Lopez, David Addai, Scott McLeod

Project sponsor: Rain Bird

Prize sponsor: Phoenix Analysis and Design Technologies

Fish Out of Water • \$300

Stochastic resonance

Design team: Katia Shtyrkova (winner), Matthias Whitney, Leslie Wu, John Armstrong

Project sponsor: Lockheed Martin

Prize sponsor: Kristy Pearson

Team Leadership 1 • \$250

Gravity-aligned collimator

Design team: Brigid Marshall (winner), Oscar Martinez, Antony Mills, Nicholas Cota

Project sponsor: College of Optical Sciences

Prize sponsor: Honeywell

Team Leadership 2 • \$250

Brain wave activity alarm

Design team: Amjad Chatila (winner), Jason VanAsdlan, Manny Fimbres, Henry Barrow, Joseph Bitz, McKay Crowder

Project sponsor: Texas Instruments

Prize sponsor: Honeywell

TMAL Honors ECE and Mechanical Engineering Alums

- Ephibian founder and ECE alum Teri Spencer recognized as shaper of the future
- Lifetime achievement award for bar code guru and data capture pioneer David Allais

Teri Spencer, the co-founder, CEO and president of Ephibian, won a Shaping the Future Award at the 2009 Technology and Management Awards Luncheon (TMAL) held in October at the Arizona Biltmore Resort & Spa in Phoenix, Ariz.



Teri Spencer

Spencer graduated from UA in 1987 with a bachelor's degree in electrical and computer engineering. While at UA, she was a founding member of Iota Xi, the UA chapter of Eta Kappa Nu, the electrical and computer engineering honor society.

Under her leadership, Ephibian has grown from a few people in a garage to a company providing custom software development, data integration and web design services and software to companies around the world, including AOL, Intuit, Honda, AT&T, IBM, Marriott, Hughes, Sears, and Bell Atlantic.

The TMAL awards were established 11 years ago to recognize the competitive advantage resulting from collaboration between engineering and business, and to create awareness in the business community of the collaborative courses and student-focused programs being pursued by the College of Engineering and the Eller College of Management.

The awards were presented by UA President Robert N. Shelton; Paul Portney, dean of the Eller College of Management; and Jeff Goldberg, dean of the College of Engineering.

The other Shaping the Future Award went jointly to Roxanne Ivory and



Teresa Briggs



Roxanne Ivory

Teresa Briggs. Ivory is vice president of marketing for Limelight Networks Inc., before which she was a senior director of consumer marketing at Motorola, and director of worldwide product communications at Apple. Briggs is the managing partner for Deloitte Touche's Silicon Valley practice, which comprises nearly 1000 people serving Silicon Valley's technology and life sciences companies.

The College of Engineering Lifetime Achievement Award went to internationally recognized bar coding expert David Allais, who has degrees in mechanical engineering from the University of Arizona and in electrical engineering from Stanford University.



David Allais

As vice president and later president and CEO of Intermec Corporation, he built the company from a small startup into the leading manufacturer of bar code equipment. He is now nonexecutive chairman of PathGuide Technologies, which he founded in 1989.

Allais is a major force in the field of data collection, and he has created five bar code symbologies: Code 39, Interleaved Two of Five, Code 11, Code 93, and

Code 49. He is also a named inventor on five bar-code-related patents.

The Eller College Lifetime Achievement Award went to Cheryl Morley, who is responsible for enterprise strategy at Monsanto, including investment portfolio analysis, mergers, acquisitions and divestitures. She was previously president of the company's Animal Agricultural Group, and led marketing and business development for its NutraSweet product.



Cheryl Morley

The keynote speaker was Robert E. Grady, who retired in June as a director at the Carlyle Group, one of the world's largest private equity firms. Grady's speech focused on the importance of innovation to the U.S. economy. "In 2007, only two percent of the countries in the world were experiencing negative economic growth," Grady told the audience. "The key reason for this success is the contribution of technological innovation to productivity and economic growth."



Robert Grady

Grady went on to say that, despite current conditions, there was cause for optimism. He cited the explosion in mobile devices. "Manufacturers and developers are in a war to serve us better, and the war is just beginning," Grady said. He also pointed to the rise in cloud, or grid, computing and the \$70 billion a year medical device industry as indicators of future economic health.



College of Engineering/Pete Brown

Raising a Check—Lockheed Martin presents the College of Engineering with a giant check representing funds to build a new materials testing lab. Dean of Engineering Jeff Goldberg is in the white shirt; left to right are Lockheed Martin’s Steve Lasswell, Jim Signorile, Art McAnarney, Keith Pedersen, and Marvin Kleine.

Lockheed Martin Funds New Materials Testing Lab

Lockheed Martin has provided UA with \$96,100 to partially fund the creation of the Lockheed Martin Materials Testing Laboratory in the College of Engineering.

Lockheed Martin representatives presented College of Engineering Dean Jeff Goldberg with a ceremonial check at a Lockheed Martin technology day Sept. 24. The event was held in the Student Union North Ball Room to promote engineering employment opportunities in the company’s various engineering programs, which include deep space exploration, biometric identification systems, and the F-35 Joint Strike Fighter.

The lab will enable undergraduates from many engineering disciplines to use the most modern materials testing equipment, while learning state-of-the-art methods to determine the properties of engineering materials.

The new lab, which will be housed in the aerospace and mechanical engineering building, will also contribute to student recruitment and retention, and skills learned in the lab will help students obtain placement in industry and graduate programs.

Goldberg remembers the old materials testing lab. “It was completely inadequate,” said Goldberg. “Experiments had to be moved in and out because the space was shared with other courses.” The aerospace and mechanical engineering department took up the cause and proposed a lab that could be used by people from all over the college.



College of Engineering/Pete Brown

Distinguished Company—Maria Keonjian and Wolfgang Fink at the reception announcing Fink as the first holder of the Maria and Edward Keonjian distinguished professorship.

Distinguished Professorship Honors Keonjian’s Life and Work

Edward Keonjian, the “father of microelectronics,” would have been 100 years old on Aug. 14, 2009.

To mark his centennial, the College of Engineering has announced the establishment of the Edward and Maria

Keonjian Distinguished Professorship in Microelectronics, the result of a million-dollar endowment by Keonjian and his wife Maria. The first holder of this distinguished professorship will be Wolfgang Fink, who will move to UA from the California Institute of Technology and NASA’s Jet Propulsion Laboratory.

During his life, Keonjian had more than 100 publications and 27 U.S. and foreign patents. He edited and co-authored *Microelectronics: Theory, Design, and Fabrication*, which was published in 1963; it sold more than a million copies and was translated into six languages.

Keonjian was a pioneer of low-power electronics, and in 1954 designed the world’s first solar-powered, pocket-sized radio transmitter, which is now at the Smithsonian National Museum of American History. He organized the first international symposium on low-power electronics in 1963.

Keonjian began his work in microelectronics at GE in 1951, and went on to work for Grumman Aircraft, where he supervised 165 staff and worked with Neil Armstrong as chief of failure analysis on the Apollo 11 project. He worked in India and Egypt as an electronics specialist for the United Nations, and spent 12 years on NATO’s Advisory Group for Aerospace Research and Development.



Reuse It Or Lose It

Professor Kevin Lansey, head of the department of civil engineering and engineering mechanics, and four UA colleagues have been awarded \$2 million by the NSF to research water reuse and supply systems.



Kevin Lansey

The research project will ultimately produce a computer model for water managers who are grappling with the problem of using less energy while meeting increased demand for water.

Arizona's surface-water supplies, especially near urban areas, are all spoken for, and many communities

rely on water pumped up from aquifers. Such a resource is unsustainable, and some of Lansey's research revolves around the question of how willing we are to reuse wastewater and to what extent.

"In water-scarce areas, people will eventually have to use reused water as part of their water supply," says Lansey.



"And now the question is how much further people will use it." A dual water supply

circulates two types of water throughout a community: fresh and treated. Fresh water is what we drink and wash in; treated, or recycled, water is nonpotable and can be used in toilets and fire hydrants, and for irrigation.

The computer-modeling tool will play a role in designing city recycling systems. "Instead of having one centralized plant, choose a decentralized design," says Lansey. "You could have multiple satellite wastewater treatment plants based on a dual distribution system that provides potable water for consumption and nonpotable water for reuse."

Another hard choice will eventually have to be made regarding the reuse of water for drinking. People have made it very clear that the notion of drinking former sewage water can be hard to swallow. The City of Los Angeles tried it in the 1990s, but a newspaper headline—"toilet to tap"—scared so many residents that the plan was scrapped virtually overnight.

The technology does exist to fully purify wastewater and make it safe and potable, but our resistance is understandable. In the desert Southwest, Lansey can see the day coming when demand for clean drinking water makes it a costly commodity. "We either accept expensive water or we leave the desert," he says.



College of Engineering/Ben Sternberg

Going Underground—Geoscience and geological engineering students probe the ground with a magnetometer (left) and an electromagnetic instrument (front). This is the type of class and field activity in which the Saguaro students will be involved.

Geoscientists Reach Out

The NSF has awarded \$155,000 to a group of engineers and geoscientists to launch an outreach program designed to increase the number of underrepresented students seeking geoscience-related degrees at UA.

The Saguaro program officially commenced on Sept. 1, 2009. Saguaro is an acronym for the Southern Arizona Geosciences Union for Academics, Research, and Outreach.

Much of the NSF funding will go to attracting and training minority undergraduate interns to do outreach at Tucson high schools and community colleges about geoscience careers and degrees. To reach minority high school students, Saguaro will partner with the UA Mathematics, Engineering, Science Achievement, or MESA, program, which already has a well-developed network of program coordinators and school advisors.



Phil Stokes, a geosciences doctoral student in the department of mining and geological engineering, is the program coordinator. He ran a successful similar program at the State University of New York at Buffalo while earning his master's degree in geological sciences.

One part of increasing involvement, said Stokes, requires the tearing down of a few stereotypes and misconceptions. "Kids often perceive geosciences as boring," he said. Going on fun field trips will be a part of the Saguaro program. In the successful OEDG program in Buffalo, Stokes took students fossil hunting at Niagara Falls, where they could see rock stratigraphy, and quite literally see geology in action. "Keeping kids in the class room and giving them a rock identification kit is not the answer," he said.

Jacob A. Thye BS/EM 2007

Jake Thye is currently manufacturing engineer lead on a section of the F-35 Joint Strike Fighter assembly line at Lockheed Martin Aeronautics in Fort Worth, Texas, where he has worked since graduation.

“I started as a manufacturing engineer on the F-35 program,” said Thye. “Last year, I was promoted to manufacturing engineer office lead on the fuselage station mate joint for mate and final assembly, which is where the forward fuselage and canopy mates with the center fuselage of the aircraft.”

Thye’s daily routine includes working with management, shop floor support, engineers, toolmakers, tool designers, industrial engineers, supervisors, planners, facility workers, and mechanics to get the aircraft built.

Thye recently completed First Steps Toward Leadership, a 4-month program sponsored by the Lockheed Martin Leadership Association. He received a Continuing Education Credit Certificate from the Professional Development Division of the National Management Association. Thye also received an F-35 Spot Award in March 2009 for solving a quality problem on the F-35.

When he’s not building strike fighter jets, Thye is pursuing a master’s degree in manufacturing systems management at Southern Methodist University’s Bobby B. Lyle School of Engineering in Dallas. He and his wife also volunteer for the Special Olympics, MathCounts, and Engineers in the Classroom, and perform in the Southwestern Baptist Theological Seminary Master Chorale.



Courtesy of Jake Thye

Wildcat Strike—Jake Thye in front of the main gate at Lockheed Martin’s Air Force Plant 4 in Fort Worth, Texas, where he works and where the F-35 is produced and tested. “The F-35 Joint Strike Fighter program is a thrill and an honor to be affiliated with,” Thye said.

Weldon Vlasak MS/EE 1958

Vlasak is president of Adaptive Enterprises and has been a consulting engineer since 1972.

He has written four books during the last 20 years, but his first, *The Secret of Gravity*, was not published until 1997, the same year his second book, *The Electric*

Atom, was published. The material in these books offers an alternative solution to the mysteries of the universe.

He has since published two other books: *Secrets of the Atom* in 1999, and *Planck’s Columbia Lectures* in 2005. He has also written a number of papers on

this subject. In one paper, he claims to show that electromagnetic field waves move in two directions, one of which is faster than the speed of light.

He is currently compiling a manuscript for his fifth book, which describes the composition of matter.



Weldon Vlasak

In Memoriam

Lee A. Matsch BS/ME 1954

Lee A. Matsch, 74, lost his battle with pancreatic cancer on July 21, 2009. He was born in Chicago and grew up in Park Ridge, Ill.

Matsch started his engineering education at Iowa State University and went on to the University of Arizona, where he was inducted into Tau Beta Pi before graduating with distinction with a bachelor's degree in engineering. After graduation, and marriage to Diane Noon, he moved to Pittsburgh to work for Westinghouse Electric Corp.

While Matsch was in Pittsburgh, his daughters, Sally and Pam, were born and he spent his 6-month ROTC commitment on active duty with the Army Signal Corps. After completing his engineering master's degree at the University of Pittsburgh in 1961, Matsch joined the Garrett Corporation, now Honeywell, in Phoenix, where he earned a doctorate in engineering science from Arizona State University. His son, Gary, was born in Phoenix. After stints with Ampex in California and Alabama, Matsch returned to Arizona and Garrett, where he stayed until he retired as vice president of engineering for the company's aerospace sector. After retirement he consulted for several companies, including Honeywell, Johnson & Johnson, and most recently Pratt & Whitney.

Matsch garnered numerous honors throughout his life, including UA Alumni Association Centennial Achievement Award, the ASU Distinguished Achievement Award for Leadership and Excellence in Engineering, and Fellow in the American Society of Mechanical Engineers. He served on industrial advisory councils for the engineering colleges at UA, ASU, Northern Arizona University, Brigham Young University, and Carnegie-Mellon University, and chaired the International Gas Turbine Institute of the American Society of Mechanical Engineers.

He established the Matsch Pancreatic Cancer Research Fund at the T-Gen Foundation to help raise awareness and support for this deadly disease.



Lee Matsch

Martín A. Martínez BS/ME 1984

Martínez is president of Engineering Science Analysis, which he founded in 1991. The company has test facilities in Tempe and Prescott, Ariz., and offices in Denver and Southern California. It provides consulting services and analytical software to aerospace, semiconductor, and commercial product development firms.

Martínez honed his analytical skills while working as an aerospace thermostructural analyst at AlliedSignal, now Honeywell, from 1984 to 1996, after which he led research and development at a semiconductor test company from 1996 to 1999. He is also a commissioner on the Arizona Governor's Aerospace and Defense Commission.

An ESA product known as the Squid, which is funded and used by the



Martín Martínez

Department of Homeland Security, made headlines recently—in *Wired*, *Popular Science*, and the *Wall Street Journal*, to name a few. Squid stands for Safe Quick Undercarriage Immobilization Device, which also describes its function, which is to end a car chase in a matter of seconds. The Squid is rolled in front of a fleeing vehicle and activated remotely as the vehicle passes over it, at which point the Squid blasts out a salvo of straps and harnesses that ensnare the vehicle's axles and bring it to a halt.

Patrick Barnhill, an ESA employee who was instrumental in developing the Squid, is also a College of Engineering alumnus (BS/ME 2002).

John C. Bellamy II MS/EE 1965, PhD/EE 1971

In August 2009, John C. Bellamy II was named Tau Beta Pi Alumnus Eminent Engineer at the University of Wyoming.

When Bellamy got his bachelor's degree in electrical engineering in 1963, he represented the third generation in his family to earn an engineering degree from the University of Wyoming.

He went on to get his master's and doctoral degrees in electrical engineering from the University of Arizona in 1965 and 1971.

Bellamy has worked in telecommunications and data communications product development for more than 30 years. In addition to designing and developing systems for digital switching, microwave transmission, cellular telephones,

Mickie Phipps
BS/EE 1985

Phipps and co-author David Shippy wrote the nonfiction book, *The Race for a New Game Machine – Creating the Chips Inside the Xbox 360 & the PlayStation 3*, which was published in 2009 by Citadel Press. It tells the behind-the-scenes story of the making of the microprocessors for the latest generation game consoles. The book reveals a pressure-cooker



Mickie Phipps

optical fiber networks, digital signal processing, and packet-data-based networks, he holds more than a dozen patents in communications systems technology.

Bellamy was an adjunct professor in the department of electrical engineering at Southern Methodist University, where he taught courses in telecommunications and computer programming. In 2000, the third edition

environment, top-secret work, and cutthroat competition, but it is primarily about the engineers who live in the high-tech world of chip design. The authors' goal was to help readers see through the scientific mumbo-jumbo that sometimes scares them away from technology, to demystify microprocessor design, and to inspire a few budding engineers. The book also shares the leadership lessons learned from this trial-by-fire experience.

Phipps spent six years with IBM in Austin, Texas, during which time she held ultimate responsibility for the game chips' PowerPC microprocessor core and design team. She spent 20 years with the U.S. Air Force and is a retired reservist. She left IBM in 2004 to open a small business and to pursue a career in writing. She lives in Kingsland, Texas.

of his widely read book, *Digital Telephony*, was published. More than 50,000 copies of have been published worldwide and it has been translated into Japanese and Russian.

Bellamy is a senior member of the IEEE and in 1996 received the Fred W. Ellersick prize for best tutorial paper, *Digital Network Synchronization*, which was published in 1995 in *IEEE Communications*.



Courtesy of Betsy Wilkening

Snow Business—PolarTREC teacher Betsy Wilkening collects snow samples near Barrow, Alaska, to be analyzed by OASIS researchers for nitrates and soluble species.

Betsy Villaescusa (now Wilkening)
BS/CHE 1982

Since getting her master's degree in secondary education from Northern Arizona University in 2005, Betsy Wilkening, née Villaescusa, has been teaching 7th grade science at Wilson K-8 School in Tucson, Ariz. She was chosen as a PolarTREC teacher and in March 2009 spent three weeks in Barrow, Alaska, doing atmospheric research with OASIS, or the Ocean, Atmosphere, Sea Ice, Snowpack program.

PolarTREC (TREC stands for Teachers and Researchers Exploring and Collaborating) is an NSF-funded program of the Arctic Research Consortium of the United States, in which K-12 teachers and scientists conduct polar research with a view to improving science education.

Wilkening's research involved sampling and analyzing chemical compounds in snow. She kept a blog of her time in Alaska and answered questions for students back in Arizona. She said that one of the highlights of the trip was meeting local students. On the other hand, being a Tucson native, she said the hardest part was working outside in temperatures of minus 40.

Wilkening is now using her experiences to create lessons for her science students. Her blog can be found at www.polar trec.com/ocean-atmosphere-sea-ice-and-snowpack-interactions.

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Taylor Brown Joins College As Senior Director of Development

The College of Engineering would like to welcome G. Taylor Brown as its new senior director of development. Brown comes to the UA from Georgetown University Law Center in Washington, D.C., where he served as associate director of development for major gifts for 4.5 years. Before his work at Georgetown, Brown served in development and alumni relations positions in the schools of Law and Nursing at Emory University in Atlanta, Ga. He is a native of Greenville, S.C., and received his bachelor of arts degree in political science from Wake Forest University in Winston-Salem, N.C. Welcome, Taylor!



Taylor Brown

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Where has life taken you since graduation? We'd like to know and so would your former engineering classmates.

Please e-mail us (200 words or less) and include the following:

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