The Engineering Design Showcase is the culminating experience for graduating seniors. A senior design experience is required for all students in an engineering major. Teams complete a capstone project in which they design and prototype a product, device, process, or software system.

This event brings together project teams from all eight departments for an opportunity to share student designs with the public. Also attending the event will be invited guests from industry partners and donors. These guests serve as reviewers and provide expert feedback to student teams on their exhibits and project demonstrations.

The College of Engineering is hosting a Judges Luncheon from 12-1 p.m. in the ARC Ballroom. The luncheon provides networking opportunities with faculty and industry partners and a chance to hear the latest college news. RSVP here: bit.ly/2r0E9eK

Admission is free and open to the public. For more information about the Design Showcase, please contact Alin Wakefield in the Engineering Dean’s Office at 530-752-1979 or amwakefield@ucdavis.edu.
Engineering Progress is published twice a year by the College of Engineering at UC Davis.

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UC Davis Engineering Progress • Spring 2017

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http://engineering.ucdavis.edu
ALUMNI HONORED at College of Engineering Awards Dinner

THE UC DAVIS COLLEGE OF ENGINEERING celebrated outstanding faculty and alumni at its annual Distinguished Engineering Alumni Medal awards ceremony at the Mondavi Center.

More than 120 alumni, faculty, staff, and friends gathered on Feb. 23 to recognize notable graduates whose professional and personal achievements have brought special honor to the College. Alumni were awarded for their broad and diverse achievements in business and entrepreneurial endeavors, public service, and research.

Distinguished Engineering Alumni Medal (DEAM) Recipients:

- **William L. Ballhaus**
  Chairman/CEO, Blackboard International, B.S., Mechanical Engineering, ’89

- **Ahmed M. Darwish**
  Professor, Cairo University and Chairman, Suez Canal Economic Zone, Ph.D., Electrical and Computer Engineering, ’88

- **Layton S. Han**
  CEO, Adara Media, B.S., Mechanical and Aeronautical Engineering, ’88

- **Paul C. Johnson**
  President, Colorado School of Mines, B.S., Chemical Engineering, ’83

- **Iman Oskoorouchi**
  COO, TruAdvantage, B.S., Computer Science and Engineering, ’04

- **Elizabeth G. Loboa**
  Dean, College of Engineering, University of Missouri, B.S., Mechanical Engineering, ’95

During their acceptance speeches, the honored alumni recalled the lasting impact of campus culture and faculty mentors on their personal and professional lives. Medalist Layton Han noted his experience struggling through a difficult undergraduate course, and how that experience challenged him to approach problem solving more creatively.

Attendees enjoyed a College Open House prior to the awards ceremony. The Open House was an opportunity for guests to connect with faculty and tour new and recently updated College facilities including the Engineering Student Startup Center, Engineering Student Design Center, and Coffee Lab.

The awards dinner recognized newly endowed chairs and professorship recipients as well. These endowed positions are possible thanks to the generosity of donors who support the College.

**Endowed Chair and Professorship Awards:**
- **Shuguang “Robert” Cui**, Professor of Electrical and Computer Engineering, Child Family Professorship
- **Alyssa Panitch**, Department Chair and Professor, Biomedical Engineering, Edward Teller Chair
- **Stephen K. Robinson**, Department Chair and Professor, Mechanical and Aerospace Engineering, Warren and Leta Giedt Professorship

**PLEASE SAVE THE DATE** for next year’s College of Engineering Awards Dinner, January 19, 2018 at the Mondavi Center.
Two UC Davis Faculty Elected to National Academy of Engineering in 2017

PROFESSOR DEB NIEMEIER, of the UC Davis Department of Civil and Environmental Engineering, was recognized for “developing groundbreaking tools to characterize the impact of transportation emissions on air quality and environmental justice.” Niemeier is founding director of the Sustainable Design Academy at UC Davis, former chair of the Department of Civil and Environmental Engineering, and former director of the John Muir Institute of the Environment at UC Davis. She earned her bachelor’s degree in civil engineering from the University of Texas and her Ph.D. from the University of Washington.

PROFESSOR ROSS BOULANGER, of the UC Davis Department of Civil and Environmental Engineering, was honored “for contributions to geotechnical earthquake engineering and the development of procedures for evaluating seismic behavior of soil-structure systems.” Boulanger is director of the UC Davis Center for Geotechnical Modeling, which uses a 90-foot centrifuge to simulate soil conditions during earthquakes. He earned his bachelor’s degree from the University of British Columbia, and a master’s and Ph.D. from UC Berkeley.
Peet’s Coffee Pledges $250,000 to Advance Coffe RESEARCH
Gift Will Fund Peet’s Coffee Pilot Roastery in First-of-its-Kind Coffee Center

PEET’S COFFEE ANNOUNCED on September 7, 2016 a pledge of $250,000 to UC Davis, to fund the Peet’s Coffee Pilot Roastery, which will be located in a first-of-its-kind Coffee Center. The pioneering UC Davis center and pilot roastery will be devoted to post-harvest coffee research and engineering, an underrepresented field, and aims to be the leader in coffee science.

“With this gift, we are firmly following in Alfred Peet’s footsteps and maintaining his belief in mentorship,” said Doug Welsh, vice president for coffee, Peet’s Coffee. “By joining forces with UC Davis on the innovative Coffee Center and Peet’s Coffee Pilot Roastery, Peet’s and other partners will foster the next generation of coffee experts, encouraging unique research paths and roasting approaches that will have market-ready application and industrywide influence.”

Peet’s Coffee and UC Davis launch new era of coffee research

As the vanguard of the craft coffee movement, Peet’s has put “Coffee First” for 50 years by sourcing the world’s best beans, hand-roasting them in small batches, and creating distinct, handcrafted beverages.

Supporting UC Davis in establishing the Coffee Center and Peet’s Coffee Pilot Roastery is in keeping with the legacy of the original craft coffee company. The founding gift will enable UC Davis to establish the roastery—an important element of this innovative academic center.

“The Coffee Center will generate unparalleled teaching, research and collaborative opportunities for our students, scientists and engineers, as well as for industry partners and visitors from around the world,” said Jennifer Sinclair Curtis, dean of the College of Engineering. “We are proud that Peet’s Coffee is one of our founding partners in this bold initiative. We fully expect the center will do for coffee what
the renowned UC Davis wine and brewing programs have accomplished on behalf of those industries.

**UC Davis coffee curriculum: Today and tomorrow**

Bill Ristenpart, professor of chemical engineering at UC Davis, will direct the Coffee Center and Peet’s Coffee Pilot Roastery, sharing duties with two colleagues—Tonya Kuhl, professor of chemical engineering, and Jean-Xavier Guinard, professor and sensory scientist in the Department of Food Science and Technology.

The Coffee Center builds upon “Design of Coffee,” a popular course developed by Ristenpart and Kuhl in 2012 to better engage a diverse population of students and stoke excitement around coffee and engineering. The undergraduate class, now offered every quarter, enrolled more than 1,500 students during the 2015-16 academic year. “Design of Coffee” was also voted the best course on campus in 2015 and has the highest enrollment of any elective course offered at UC Davis.

“We are extremely grateful to Peet’s Coffee for the company’s vision in supporting the Pilot Roastery,” said Ristenpart. “UC Davis already has tremendous expertise in a variety of disciplines that pertain to coffee, and now the Peet’s Coffee Pilot Roastery will provide a physical infrastructure to help focus that expertise on cutting-edge coffee science and education.”

As the Coffee Center will be the first multidisciplinary university research center in the world devoted to post-harvest studies of coffee, UC Davis expects to host large numbers of both undergraduate and graduate students eager to learn more about the art and science of coffee. The Coffee Center will also collaborate closely with the Specialty Coffee Association of America to support graduate research fellowships and to offer technical short courses aimed at people in the coffee industry.

In addition to offering opportunities for privately funded company research, public research released by the UC Davis Coffee Center will range from the microbiology of green coffee fermentation, to the chemistry of roasting and brewing, to sensory and consumer science. The center is the first step in establishing a Global Coffee Institute at UC Davis.

“This is an invitation to the entire coffee industry,” said Welsh. “It is about opening the door, but also about setting the bar for all of us to learn more together and advance the industry. Given how fundamental it is to our lives, we should invest in an understanding of coffee as profound as our enjoyment.”

**Groundbreaking Coffee Center and Peet’s Coffee Pilot Roastery**

The founding gift from Peet’s Coffee will enable UC Davis to help renovate a 6,000-square-foot building for the new Coffee Center. The one-story center will be located on the north side of the UC Davis Arboretum, in close proximity to the campus winery, pilot brewery and food-processing facilities at the Robert Mondavi Institute for Wine and Food Science.

When fully equipped, the center will include the Peet’s Coffee Pilot Roastery, an experimental green-coffee storage facility, a sensory analysis laboratory, advanced analytical labs, as well as meeting and office space.
THE UC DAVIS COLLEGE OF ENGINEERING hired 29 faculty members in 2015-16. The new faculty represent a group of scholars and teachers specializing in a range of areas including environmental sustainability, machine learning, electric vehicles and tissue regeneration. Continuing the college’s commitment to diversity, almost half of those hired are female.

The hiring done during this one year period accounts for a more than 10 percent increase in faculty bringing the total number of faculty to 210. And, these additional faculty members will help match the large growth in student enrollment. Since 2011, the college’s enrollment has increased by almost 40 percent.

Jennifer Sinclair Curtis, dean of the UC Davis College of Engineering, says that the added faculty members will help the college accomplish even more.

These new faculty members bring a breadth of engineering expertise and will join seven college departments.

Please let us introduce you to this talented group.

**BIOMEDICAL ENGINEERING**

JAMAL LEWIS, Assistant Professor, Biomedical Engineering, Ph.D., University of Florida (2012). RESEARCH: The Immunomodulatory Biomaterials Laboratory is focused on engineering novel, biomaterial systems that manipulate critical immune cells in vivo for therapy of immune-related conditions like type 1 diabetes. Further, we’re interested in understanding biomaterial-immune cell interactions, which may be instructive for future biomedical device design.

KAREN MOXON, Professor, Biomedical Engineering, Ph.D., University of Colorado (1994). RESEARCH: Neural encoding and plasticity, and neuroprosthetics and brain-machine interfaces.

ALYSSA PANITCH, Edward Teller Endowed Chair and Professor, Biomedical Engineering, Ph.D. University of Massachusetts, Amherst (1997). RESEARCH: The Panitch Lab is designing biopolymers that improve tissue healing and regeneration with the goal of limiting scar formation while promoting tissue repair. The lab focuses on both intracellular and extracellular approaches to direct molecular and cellular processes.

**CHEMICAL ENGINEERING**

COLEMAN KRONAWITTER, Assistant Professor, Chemical Engineering, Ph.D. UC Berkeley (2012). RESEARCH: Chemical and materials aspects of new energy technologies, with particular focus on understanding chemical transformations driven by electrocatalytic and catalytic processes.

PRIYA SHAH, Assistant Professor, Chemical Engineering, Ph.D. UC Berkeley (2011). RESEARCH: The Shah Lab applies systems biology and engineering principles to study how infectious diseases hijack the cellular recycling process, and develops synthetic biology approaches to control these processes for biotechnology and biomedical applications.

NEW FACULTY Welcomes Record Number of College of Engineering 2017

Assistant Professor, Civil and Environmental Engineering, Ph.D. Stanford University (2011). RESEARCH: From water reuse in California to resource-oriented sanitation in South Africa, Dr. Bischel is interested in safe and efficient reuse of water resources and sustainable sanitation to improve environmental and human health.

MAUREEN KINYUA, Assistant Professor, Civil and Environmental Engineering, Ph.D. University of South Florida (2015). RESEARCH: Focuses on livestock, human and solid waste treatment and nutrient and energy recovery for communities, especially those in developing countries.

ALEJANDRO MARTINEZ, Assistant Professor, Civil and Environmental Engineering, Ph.D. Georgia Institute of Technology (2015). RESEARCH: Focuses on the behavior of soils and soil-structure interfaces with applications in foundations, earth retaining structures and soil reinforcement systems. Utilizes experimental and discrete element modeling techniques, as well as elements of bio-inspiration.

SABBIE MILLER, Assistant Professor, Civil and Environmental Engineering, Ph.D. Stanford University (2014). RESEARCH: Designing sustainable infrastructure materials and bio-based composites, integrating sustainability into structural design, and improving durability of civil engineering materials.

VERONICA MORALES, Assistant Professor, Civil and Environmental Engineering, Ph.D. Cornell University (2008). RESEARCH: Colloid and nanoparticle fate in soils; transport through porous media; biochar engineering.


KATERINA ZIOTOPOULOU, Assistant Professor, Civil and Environmental Engineering, Ph.D. UC Davis (2014). RESEARCH: Geotechnical earthquake engineering with an emphasis on liquefaction and its effects on structures and lifelines, and the constitutive modeling of liquefiable soils and bio-cemented sands. Numerical modeling of soil-structure systems, systems engineering, and risk quantification.

JONATHAN HERMAN, Assistant Professor, Civil and Environmental Engineering, Ph.D. Cornell University (2015). RESEARCH: Water resources planning and management under uncertainty; multi-objective optimization and decision support; system dynamics simulation of coupled human-environmental systems.

COLLEEN BRONNER, Lecturer PSOE, Civil and Environmental Engineering, Ph.D., State University of New York, Buffalo (2014). RESEARCH: Improving engineering pedagogy by incorporating active learning strategies without loss of content, teaching design through project-based learning and developing professional skills of students. Promoting diversity and inclusion and engaging underrepresented groups in engineering. Assessing strategies for integrating engineering into K-12 education.

ALEXANDER FORREST, Assistant Professor, Civil and Environmental Engineering, Ph.D., University of British Columbia (2011). RESEARCH: Investigating the influence that lakebed and seafloor features have on localized hydrodynamic flows and use of autonomous robotics and emerging technologies in a diverse range of applications from temperate reef systems in Australia to under-ice fluid dynamics in Antarctica.

COMPUTER SCIENCE

DAVID DOTY, Assistant Professor, Computer Science, Ph.D., Iowa State University (2009). RESEARCH: studies formal mathematical models of synthetic molecular systems capable of autonomous computation, such as custom-designed chemical reactions and “algorithmic crystals,” seeking to understand their fundamental logical and physical limits.

“THESE OUTSTANDING NEW FACULTY REPRESENT THE FUTURE OF THE UC DAVIS COLLEGE OF ENGINEERING. ALL CREDIT FOR RECRUITING THESE NEW HIRES GOES TO OUR CURRENT FACULTY WHO HAVE A BOLD AND INCLUSIVE VISION FOR OUR COLLEGE’S FUTURE.”

– Jennifer Sinclair Curtis, dean
KURT EISELT, Lecturer
SOE, Computer Science, Ph.D., University of California, Irvine (1983). RESEARCH: Exploration of tools and techniques to improve the educational experience for computer science students. Also, investigation into how combining social and communication skills training with technical education might create more and better life opportunities for youth on the autism spectrum.

CHO-JUI HSIEH, Assistant Professor, Computer Science, Ph.D., University of Texas, Austin (2015). RESEARCH: Machine learning and optimization for big data as well as various application areas including recommender systems and social networks.

ELECTRICAL AND COMPUTER ENGINEERING

SRABANTI CHOWDHURY, Associate Professor, Electrical and Computer Engineering, Ph.D. UC Santa Barbara (2010). RESEARCH: Wide bandgap semiconductor electronics devices with thrust on GaN, Diamond, Oxides. Energy efficient electronics for next generation power conversion and RF applications. Electronics for harsh environment; large area flexible electronics; exploratory research for biological applications.

SHUGUANG (ROBERT) CUI, Child Family Endowed Chair and Professor, Electrical and Computer Engineering, Ph.D. Stanford University (2005). RESEARCH: Data driven large-scale information analysis and system design, including distributed signal processing, large-scale data analysis, data driven wireless system design, and cognitive network optimization.

J. SEBASTIAN GOMEZ-DIAZ, Assistant Professor, Electrical and Computer Engineering, Ph.D. Technical University of Cartagena, Spain (2011). RESEARCH: The efficient control and manipulation of electromagnetic waves in unprecedented ways, aiming to overcome the limitations of current technology and communication systems in terms of dynamic reconfiguration, integration and miniaturization while simultaneously boosting their performance and enabling novel functionalities.


HOOMAN RASHTIAN, Lecturer PSOE, Electrical and Computer Engineering, Ph.D. University of British Columbia, (2013). RESEARCH: Pedagogical or curricular innovation for teaching undergraduate courses in Electrical Engineering including designing modern laboratories and project-based courses for freshman and senior students. And designing novel analog, radio-frequency, millimeter-wave and terahertz integrated circuits for ultra-fast and ultra-low-power communications.

MATERIALS SCIENCE AND ENGINEERING

ROOPALI KUKREJA, Assistant Professor, Materials Science and Engineering, Ph.D. Stanford University (2014). RESEARCH: Use of X-ray techniques to image and understand the response of electronic and magnetic materials across electronically or optically driven transitions. This provides us with a unique method to image the phase transformation or switching dynamics in these materials and manipulate physical properties on ultrafast timescales.

SUSAN GENTRY, Lecturer PSOE, Materials Science and Engineering, Ph.D., University of Michigan, Ann Arbor (2012). RESEARCH: Integrating computational modules into the undergraduate and graduate materials curriculum, focusing on curriculum development and pedagogy. She is also investigating barriers to transfer student success as a part of her engineering education research.

MECHANICAL AND AEROSPACE ENGINEERING

SEONGKYU LEE, Assistant Professor, Mechanical and Aerospace Engineering, Ph.D., Pennsylvania State University (2009). RESEARCH: Conducting mathematical and computational research on fluid mechanics, aerodynamics, and aeroacoustics.

XINFAN LIN, Assistant Professor, Mechanical and Aerospace Engineering, Ph.D. University of Michigan (2014). RESEARCH: physics-based and system-level modeling and estimation and control of dynamic systems. Specific applications include the energy and automotive systems, such as battery management for electric vehicles and control of renewable energy systems.

JASON MOORE, Lecturer PSOE, Mechanical and Aerospace Engineering, Ph.D., University of California, Davis (2012). RESEARCH: design of vehicles and machines that are “aware” of human intentions and thus can be optimally controlled by them. His work in single track vehicles and powered lower limb prostheses uses an amalgamation of multibody dynamics, robotics, optimal control, biomechanics, system identification, physiology, and software engineering.
UC DAVIS COLLEGE OF ENGINEERING

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MONITOR. ANALYZE. LEARN. IMPROVE. THEN REPEAT. Chen-Nee Chuah says she’s applied this approach to most things in her life, even in childhood.

She says her need to bring order to her environment would drive her parents crazy. But she says she came by it naturally. Chuah grew up in Malaysia and her mom and dad owned a grocery store. They had to manage supply and demand every day and didn’t use a calculator when ringing up customers and giving them change. Her parents were not formally educated but of their six children, half of them went on to become engineering professors.

It’s fitting that now as a professor in the UC Davis Department of Electrical and Computer Engineering Chuah has taken on the task of improving the sprawling and almost impenetrable network powering our computers and smart phones.

She leads the Robust and Ubiquitous Networking (RUBINET) Research Group and is an ACM Distinguished Scientist and a Fellow of the Institute of Electrical and Electronic Engineers (IEEE).

She compares her work monitoring the network to managing vehicle traffic. As people stream videos on their phones and send emails each one of those actions creates what’s called a packet. And millions of these packets have to make it to a destination.

“Network routers are like the intersection and they decide where to send the packets next, and different routers together send it on a path. If you send too much traffic, then the routers get overloaded and congested and start to drop packets.”

So Chuah is analyzing the network to improve its function.

“Given the traffic demand we want to know how to route this traffic through your network so that we minimize the delay and loss for the user,” she says. “And at the same time, from the provider’s perspective, you don’t want to overload the link because if the link fails you have to reroute the packet.”
And when a packet is rerouted it causes a delay for the customer or can result in dropped packets, which can lead to a dropped call, lost video frame, or data download failure.

When Chuah was completing her Ph.D. at UC Berkeley, her research was focused on Quality of Service (QOS), particularly investigating the health of the core network. She built upon her doctoral research when she first worked at Sprint and then became a professor at UC Davis in 2002.

“We had to design a software that pretended to be a router so that we could listen in to the router messages and then piece together what was happening,” she says. “This was the first project I did with Sprint and was part of my Career Proposal with the National Science Foundation that was looking at routing failures. We came up with a failure restoration mechanism that can minimize the disruption during link/node failures.”

From there Chuah went on to work on developing a way to actually measure network traffic and network performance. She says because the network has become so complex it is nearly impossible to track packets of information individually because there is too much data running 24/7.

“When the internet was designed the idea was ‘let’s keep the network simple,’” Chuah says. “But the intelligence has been pushed to the edge. Now, the trend starts to reverse, and with software defined networks (SDN) and network function virtualization (NFV), new network functions and services are being embedded in the network itself.”

To try and measure network traffic, Chuah first used a passive observation method that relied on sampling streams that would not interfere with traffic forwarding.

“It’s a production network so you cannot stop forwarding normal customer traffic while collecting measurements. You have to design measurement methods that are non-intrusive,” she says.

However, this method can be very limiting depending on the network monitoring applications. First, the sampling rate itself needs to be adaptive given that network traffic is constantly fluctuating. Second, sampling often results in bias towards heavy flows that generate a lot of packets and loses out on small flows (e.g., single scanning packets). However, information on

the latter is often important for security analysis/detection.

From 2008 to 2012 Chuah worked with colleagues at UC San Diego, the Georgia Institute of Technology and the University of Minnesota to develop a more advanced method called Programmable MEasurement (ProgME). This enabled programmable module measurement on each node and provided much more adaptability.

“So you can adapt a rate and ask, ‘how fast do you want to sample?’” she says. “Or, which traffic population do I want to sample? For security detection, maybe I don’t care about most of the traffic but if it’s coming from a specific IP address or port range then I want to pay more attention.”

In addition to the challenges of measuring such a high volume of information on the network, Chuah says in the past it was difficult to instrument novel learning or measurement techniques on the router itself due to proprietary implementation details. With the advent of software defined networking and the introduction of Open Flow protocols, more router vendors can support the capability to talk to the router and program it remotely through Open Flow APIs.

“It’s a perfect match for our work because previously we had to build our programmable measurement modules on reprogrammable hardware,” she says. “But now I can map what I wanted to do originally for programmable measurements onto SDN (Software Defined Networking) routers.”

Chuah says this measurement advancement brings up a more interesting question.

“Now that I have this capability, the next question is how do I program the router on-the-fly to react to changing network and traffic conditions?” she says. “It’s an online learning problem where we need to monitor the traffic, analyze and learn from it, and drive the optimal measurement rules for the next time window.”

This is the focus of a recently completed NSF project called Learn, Adapt and Profile (LeAP), led by Chuah, along with her colleague Qing Zhao, a professor in the UC Davis Department of Electrical and Computer Engineering, as well as a collaborator at Hewlett-Packard Laboratories.

This is another step in her journey to find new and better ways to analyze and improve our computer networks.
Engineering Student Startup Center Welcomes NEW DIRECTOR

LIZ TANG says she’s found her dream job as the new director of the UC Davis Engineering Student Startup Center (ESSC). Tang started the position in July 2016 after overseeing operations of a technology consulting firm in Washington D.C. After receiving a B.S. in Chemical Engineering from Washington University, Tang worked for an environmental engineering firm in the Bay Area. She then went on to the University of Virginia Darden School of Business to complete an MBA. Once she finished her business degree, Tang was the co-owner of a granite countertop company.

Now at UC Davis, she’s looking forward to using her varied work experience and education to help engineering students implement their ideas to make the world a better place. “It’s the marriage of two things that I’m really passionate about: technology and business,” she says.

The Engineering Student Startup Center, located in 1122 Bainer Hall, opened in 2013 and has been a startup incubator for more than 850 students across campus. The Center gives all UC Davis students the resources to help develop ideas into technology startups. The student-run Center is stocked with tools like 3D printers and a ShopBot CNC device for the milling and machining of plastics, wood and aluminum. The Center also offers students regular training and certification workshops for 3D printing and prototyping.

Tang says the idea is to give students in a variety of disciplines the time and equipment to conceptualize, produce and test products. Examples of those creations include using a smartphone as an all-in-one laboratory that incorporates modular attachments for educational purposes and a 3D printer that uses sugar rather than plastic to create edible objects.

Team work, she says, is a key component of taking an innovative idea and turning it into a successful business. And, she says, that’s where the Center can make a difference.

When Tang was an engineering student there was nothing available like the Engineering Student Startup Center on her campus. “I wanted to get some business background but that is really hard to get in undergrad,” she says. “There is so much coursework that you have to take and if you want to graduate in four years there really isn’t time to take electives that you are passionate about and will help you in your career.”

Building relationships with UC Davis graduates and venture capitalists is another goal for Tang. “We have so many great alumni who are business leaders between the state Capitol and San Francisco,” she says. “One of my responsibilities will be getting students in touch with the right alumni.”

Liz Tang, director of the UC Davis Engineering Student Startup Center.
Photo by Sean M. Ayres/UC Davis
ALUM RINGS IN 10 YEARS
as Publicly Traded Company at NASDAQ

JOHN M. WASSON, President and Chief Operating Officer of ICF International, and the rest of the ICF management team, rang the opening bell at the NASDAQ in New York’s Times Square on September 20, 2016. The ceremony was part of the global consulting firm’s celebration of its 10-year anniversary as a publicly traded company.

ICF employs nearly 6,000 professionals and specializes in two broad areas: energy, environment and infrastructure; and health and social programs. With more than 70 offices worldwide, ICF works with clients in government; companies in the energy, health, technology, financial services, aviation and consumer/retail industries; and foundations and non-profit organizations. The firm will have revenues of approximately $1.2 billion in 2016.

In 1984 Wasson graduated from UC Davis with a bachelor’s degree in chemical engineering and he joined ICF as an Associate in 1987. In 2003 he was named Chief Operating Officer and in 2010 added the title of President. During his tenure as President and COO, ICF has experienced significant organic growth and has made nineteen acquisitions. The firm has grown approximately four-fold in the ten years it has been a publicly traded company.

Wasson has maintained his ties to UC Davis and provides ongoing support to his alma mater. In 2012, he made a generous donation to help renovate and refit lab space to develop a new engineering class called the “Design of Coffee,” which is now the most popular elective undergraduate course at UC Davis. He also established the John Wasson Study Abroad Fellowship to provide engineering students with a $7,000 scholarship for international studies.

For three years Wasson has served on the College of Engineering’s Dean’s Executive Committee, which is comprised of primarily high-profile college alumni who provide philanthropic guidance. In the summer of 2017 Wasson will become the Chair of the Dean’s Executive Committee.
UC Davis Outstanding Alumna Award:
DIANE BRYANT, ’85

Currently the Executive Vice President of the Data Center Group at Intel, Bryant has served on the College of Engineering’s Dean’s Executive Committee since 2012 and has been a Cal Aggie Alumni Association (CAA) Life Member since 1998. A tireless advocate for women in STEM, she established the Diane Bryant Scholarship for Engineering at UC Davis in 2013 to assist, in her words, “a small handful of excited and motivated young women each year” who decide to pursue engineering at her alma mater. Before she became an accomplished tech executive and was named one of Forbes’ 50 Most Powerful Women in Business, Bryant became financially independent while still in high school and paid her own way through her undergraduate education.

Dean Emeritus John Kemper was the second dean of the College of Engineering, a position he held from 1969 until his retirement in 1983. He had lunch with Dean Jennifer Sinclair Curtis on September 4, 2016 in Medford, Oregon. The former and current dean discussed the history of the college as well as future initiatives. Dean Kemper lives in Medford where he continues to enjoy his retirement and is an avid bird watcher and nature enthusiast.
IT’S DIFFICULT TO MAKE PREDICTIONS, especially about the future, and even more so when they involve the reactions of living cells—huge numbers of genes, proteins and enzymes, embedded in complex pathways and feedback loops. Yet researchers at the University of California, Davis, Genome Center and Department of Computer Science are attempting just that, building a computer model that predicts the behavior of a single cell of the bacterium Escherichia coli.

The results of their work were published Oct. 7, 2016 in the journal Nature Communications.

The new simulation is the largest of its kind yet, said Ilias Tagkopoulos, professor of computer science at UC Davis, who led the team.

“The number of layers, and the amount of data involved are unprecedented,” he said. The dataset on which the model is based includes, for example, over 4,389 profiles of the expression of different genes and proteins across 649 different conditions. Both the dataset, named “Ecomics” and the integrated model, MOMA (Multi-Omics Model and Analytics) are available to other researchers to use and test.

The model could be useful to researchers as a fast and inexpensive way to predict how an organism might behave in a specific experiment, Tagkopoulos said. Applications range from finding the best growth conditions in biotechnology to identifying key pathways for antibiotic and stress resistance.

Collecting and downloading the data took a week, but processing the data into a single dataset took two years of the three-year project, Tagkopoulos said. The team built models for four layers, starting with gene expression and working up to the activity at the whole-cell level. Then they integrated the layers together. They used techniques in machine learning to train the models to predict the behavior of each layer, and ultimately of the cell itself, under different conditions.

The model was built on computer clusters at UC Davis, and on supercomputers available through a national network. The researchers received a National Science Foundation grant of computing time on “Blue Waters,” one of the world’s most powerful supercomputers, at the National Center for Supercomputer Applications.

Although E. coli is a well-known organism, we are far from knowing everything about its biochemistry and metabolism, Tagkopoulos said.

“We are exploring a vast space here,” he said. “Our aim is to create a crystal ball for the bacteria, which can help us decide what is the next experiment we should do to explore this space better.”

With collaborators at Mars Inc., Tagkopoulos hopes to begin building similar databases and models for bacteria involved in foodborne illness, such as Salmonella enterica and Bacillus subtilis. He expects other researchers to draw on the Ecomics database, and hopes to make the MOMA model interface more accessible for biologists to use.

“We’re living in an amazing era at the intersection of computer science, engineering and biology,” he said.

Co-authors on the paper are Minseung Kim at the UC Davis Department of Computer Science and Genome Center, and Navneet Rai and Violeta Zorraquino, UC Davis Genome Center. The work was supported by the U.S. Army Research Office and the National Science Foundation.
Bruce Gates Receives Michel Boudart Award for Advances in Catalysis

Dr. Bruce C. Gates, distinguished professor of chemical engineering at UC Davis, was recently announced as the recipient of the 2017 Michel Boudart Award for Advances in Catalysis for his pioneering contributions to the field.

The award recognizes the development of new methods or concepts that advance the understanding and practice of catalysis on a global scale. Catalysts accelerate chemical reactions, and most biological and industrial reactions are catalytic. Catalysts lower production costs, save energy, and reduce waste and pollution.

Gates is widely respected as one of the most influential researchers in catalysis. His recent work has resulted in unprecedented advances in the understanding of the structure and performance of solid catalysts at the molecular scale, and his research group’s skills in precise synthesis have resulted in well-defined new families of catalysts. These advances will help industry and academic researchers better understand the capabilities of existing catalysts and identify new ones.

In 1992, Gates joined the faculty at UC Davis after 23 years at the University of Delaware, where he served as the director of the Center for Catalytic Science and Technology from 1981-88. During his time at UC Davis, Gates has played a key role in developing catalysis research and continues to work with graduate and postdoctoral researchers at the college.

Gates was elected to the National Academy of Engineering in 2007 for his scholarship on catalysis, including work on supported molecular catalysts and innovative research on hydrosis. His research led to a fundamental understanding of the reactions of “bottleneck” compounds in heavy oils and efficient processes for their removal by catalytic hydrosis. This research resulted in significant improvements in air quality by reducing sulfur oxide emissions from vehicles and power plants. During his induction into the Academy, Gates was lauded for his exemplary leadership in collaborative university and industry research and for his role in educating two generations of catalytic scientists and industrial practitioners.

Gates earned his bachelor’s degree from UC Berkley in 1961 and his Ph.D. from the University of Washington, in 1966.

The Michel Boudart Award is given biennially and will be presented this summer to Gates at the North American Catalysis Society Meeting in Denver and at the European Federation of Catalysis Societies Meeting in Florence, Italy.

Professor Emeritus Bruce White’s Retirement Celebration

A reception was held on December 1, 2016 in the Bruce and Marie West Lobby of Kemper Hall to honor Professor Emeritus Bruce White. Approximately 75 faculty, staff, students and administrators from across the college and campus were in attendance to thank Bruce for more than 40 years of service to the College of Engineering. Bruce began his career at UC Davis as a faculty member in the then Mechanical and Aeronautical Engineering Department in January 1975 and retired from his role as the college’s Executive Associate Dean in December 2016. Bruce served as Interim Dean of the college from 2009 to 2011.

Photo: Professor Emeritus Bruce White (left), Dean Jennifer Sinclair Curtis, and former dean, Enrique Lavernia
DR. REGINALD DesROCHES, a world-renowned seismic scholar, visited UC Davis on Sept. 28 to deliver his lecture, “From Haiti to California—Challenges and Opportunities for Reducing Earthquake Risks.”

DesRoches is the Karen and John Huff School Chair and Professor of Civil and Environmental Engineering at the Georgia Institute of Technology. DesRoches was born in Port-au-Prince, Haiti, and talked about the 2010 Haiti earthquake, which was one of the most devastating natural disasters in modern times. Officials estimate the earthquake killed or injured more than 600,000 people. DesRoches served as the key technical leader in the U.S. response to the Haiti earthquake and led a team of engineers, architects, city planners, and social scientists to analyze its aftermath.

He has focused his research on the design of resilient infrastructure systems under extreme loads and has published more than 300 articles on resilience and seismic risk assessment. DesRoches has also participated in numerous congressional briefings to underscore the critical role that university research must play in addressing the country’s infrastructure crisis and resilience to natural hazards.

This lecture was organized by the UC Davis Department of Civil and Environmental Engineering.


Poor is the Michael Henry Strater University Professor of Electrical Engineering at Princeton University. Poor served as dean of Princeton’s School of Engineering and Applied Science from 2006 to 2016 and is a leader in wireless communications.

“Smart grid” is a term that applies to an emerging generation of electricity grids that have a cyber-layer of sensors, controls, and communication superimposed on a physical or electromechanical layer of a traditional electricity grid, Poor explained. Smart grid technology allows for two-way communication between energy consumers and utility companies, resulting in increased efficiency, reliability, and security of energy systems.

Unlike traditional electricity grids that are prone to failures and blackouts, smart grids are self-monitoring and self-healing. Poor also emphasized the potential for the application of smart grid technology in the U.S., where electricity use currently accounts for approximately 38 percent of the carbon footprint.

This lecture was organized by the UC Davis Department of Electrical and Computer Engineering.
At a faculty recognition reception in October, Dean Curtis honored the following faculty who received major national and international fellowships, awards and appointments, as well as the most prestigious college and university awards during 2015-2016.

**Biological and Agricultural Engineering**
- Ken Giles – American Society of Agricultural and Biological Engineers Cyrus Hall McCormick-Jerome Increase Case Gold Medal
- Michael McCarthy – Institute of Food Technologists Fellow
- Ning Pan – American Physical Society Fellow
- Paul Singh – Global Confederation for Higher Education Associations for Agriculture and Life Sciences World Agriculture Prize Laureate
- Jean VanderGheynst – UC Davis Distinguished Postdoctoral Scholar Mentoring Award and Congressional Woman of the Year Award
- Ruihong Zhang – American Society of Agricultural and Biological Engineers Fellow

**Biomedical Engineering**
- John Boone – American Academy of Radiology Distinguished Investigator Award
- Simon Cherry – National Academy of Engineering Election, NIH/National Cancer Institute Outstanding Investigator Award, IEEE Marie Slodowska-Curie Award, World Molecular Imaging Society Fellow, World Imaging Society Gold Medal
- Kathy Ferrara – IEEE Distinguished Lecturer Award
- Angie Louie – Biomedical Engineering Society Fellow
- Alyssa Panitch – National Academy of Inventors Fellow, Biomedical Engineering Society Fellow, American Institute for Medical and Biological Engineers Vice President At-Large
- Scott Simon – Federation of American Societies for Experimental Biology Vice President Science Policy

**Civil and Environmental Engineering**
- Yannis Dafalias – American Society of Civil Engineers Fellow
- Jon Herman – American Society of Civil Engineers Quentin Martin Award
- Lev Kavvas – Japan Society of Hydrology and Water Resources International Award, American Society of Civil Engineers James Croes Medal
- Jay Lund – American Society of Civil Engineers Distinguished Fellow
- Amit Kanvinde – American Society of Civil Engineers Walter Huber Civil Engineering Research Prize

**Chemical Engineering**
- Adam Moule – Alexander von Humboldt Research Fellowship for Experienced Researchers
- Alexandra Navrotsky – American Ceramic Society Kingery Award, American Geochemical Society Goldschmidt Medal

**Computer Science**
- Dan Gusfield – International Society of Computational Biology Fellow, UC Davis Distinguished Professor Recognition
- Biswanath Mukherjee – IEEE Optical Networking Technical Achievement Award, UC Davis International Community Building Award
- Phil Rogaway – Privacy-Enhancing Technology Symposium Award, Real World Cryptography Levchin Prize

**Electrical and Computer Engineering**
- Srabanti Chowdhury – International Symposium on Compound Semiconductors Young Scientist Award
- Linda Katehi – National Academy of Engineering Simon Ramo Founders Award

**Erkin Şeker** – Cellular and Molecular Bioengineering Young Innovator

**Mechanical and Aerospace Engineering**
- Harry Cheng – UC Davis Chancellor’s Innovation Award
- Cristina Davis – UC Davis Chancellor’s Innovation Award, American Institute for Medical and Biological Engineering Fellow
- Rida Farouki – UC Davis Distinguished Professor Recognition
- David Horsley – National Science Foundation’s Industry/University Cooperative Research Centers Alexander Schwarzkopf Prize for Technological Innovation
- Bahram Ravani – UC Davis Distinguished Professor Recognition
- Steven Velinsky – UC Davis Distinguished Professor Recognition
- Kazuo Yamazaki – UC Davis Distinguished Professor Recognition

**Materials Science and Engineering**
- Ricardo Castro – UC Davis Chancellor’s Leadership Professor
- Subhash Mahajan – Institute of Metals Lecture and R. F. Mehl Medal
- Sabyasachi Sen – American Ceramics Society Varshneya Frontiers of Glass Science Lectureship
- Jim Shackelford – North American Materials Education Symposium Award
HONORS MEL RAMLEY

PROFESSOR EMERITUS MELVIN R. RAMEY’s colleagues, friends and former students have established a student-support fund in his name. In addition, the lobby of the Student Community Center was dedicated in his name during a special ceremony on October 13, 2016.

The Melvin R. Ramey Fund for Student Success, an endowment campaign, will support student services provided in the Student Community Center. The fund will support students who are leaders in the student retention and success centers of the university, providing training and support for peer advisors and outreach coordinators, and for students who serve as dynamic leaders in their respective communities.

The fund’s webpage includes this biographical information: “A lifelong educator, researcher, mentor and coach, Dr. Melvin Ramey inspired generations of Aggies over his 37 years of service at UC Davis. Mel set high standards for his students, believing each one will achieve their fullest potential through hard work, commitment and a can-do spirit.

“A distinguished faculty member and administrator in the College of Engineering, a respected researcher and a caring coach, Mel became a strong advocate for all students throughout his career, but in particular for students of color and for the programs that help them succeed in college.

“He provided advice and guidance to fellow faculty members on matters of discrimination, and his service on campus-wide committees had a positive impact on the campus climate.”

Ramey joined the civil and environmental engineering faculty in 1967, served as department chair and also held other administrative posts, including Associate Dean of Graduate Studies. He also had a long affiliation with athletics, as an assistant track coach and faculty athletics representative. He retired in 2004.
A TEAM OF UC DAVIS ENGINEERING STUDENTS and a nonprofit in Cambodia are working together to clean up water in the Tonle Sap Lake, one of the world’s most productive freshwater fisheries. The three mechanical engineering undergraduates—Joanne Wu, Rachel Muradian, and Yao Guan—spent the month of August installing sanitation systems they refined at UC Davis on the largest lake in Southeast Asia.

These devices will provide floating villages with individual septic systems that can be installed in homes. Currently the disposal of human waste goes straight into the lake that provides millions of people in this region with their homes, food and livelihood.

Staying healthy when your life is on the water

Imagine almost 100,000 people living in clusters of densely populated floating villages with houses and schools built on top of large raft-like structures. While the inhabitants have created communities on the water, they don’t have the luxury of electricity or plumbing. Fecal matter dumped into the lake festers and grows harmful bacteria in the same water that people drink, cook with and use to bathe.

Jason Moore, lecturer in the UC Davis Department of Mechanical and Aerospace Engineering, is the faculty advisor for the student team working on the sanitation project. He says now that so many people live in the floating villages, the lake can’t absorb this volume of human byproducts.

“In the past when we didn’t have as many people on the planet this wasn’t an issue,” he says. “But as soon as you get this density of people you have problems. We’re seeing a lot of stomach-related illnesses due to giardia and E. coli.”

This form of waste disposal not only hurts the humans living on the lake, but also disrupts the health of the lake’s ecosystem. Tonle Sap has more than 150 fish species, the world’s largest freshwater snake population, and is home to several globally threatened
birds. The Mekong giant catfish also lives in the lake and is one of the largest freshwater fish in the world. And in 1997, Tonle Sap Lake was designated a UNESCO Biosphere Reserve.

During monsoon season Tonle Sap, which flows into the Mekong River, more than quadruples in size, creating a huge wetland that sustains the region and country of Cambodia. According to Conservation International, Tonle Sap and Cambodia’s inland fisheries produce 500,000 tons of fish a year. This fish production accounts for more than two-thirds of Cambodia’s protein consumption and is an estimated $2 billion industry.

With such a great variation in water levels, a floating village during the wet season can become a town waylaid on land during the dry season. The people living in the floating villages choose to make their home on the water mainly because they need to fish all year. The wildlife from the lake feeds their families and also gives them a source of income. It’s difficult to fish during the dry season when their houses are much farther from the water, so the villagers have devised a way to move with the water levels, similar to a floating dock.

Building a sanitation system without a plumbing infrastructure

The students started their collaboration with Wetlands Work!, a nonprofit that designs wastewater treatment solutions, in the fall of 2015. Moore knew a senior engineer at the organization, Irina Chakraborty, who is a UC Davis alumna with a Ph.D. in Civil and Environmental Engineering. The students took on a senior project to improve a sanitation system for floating houses.

Wetlands Work! says that by designing ecologically engineered water treatment processes it can transform domestic sewage into improved water that can help sustain the millions of organisms living in the lake. It can also provide an affordable solution to sanitation for off-the-grid rural areas where poor, underserved populations live.

Initially the students were tasked with fixing some mechanical deficiencies with an existing product the

“THE STRUCTURAL INTEGRITY WAS NOT SUFFICIENT FOR HOLDING THE WEIGHT AND DEALING WITH THE WAVES.”

– JASON MOORE

continued on page 24
Children play in the water surrounding their floating homes. The residents don’t have a plumbing system, so they dump untreated human waste into the water, causing the formation of harmful bacteria like *E. coli*. Photo contributed by Rachel Muradian.

**One Month in a Floating Village** continued from page 23

Students designed a sanitation system using a 50-gallon drum on stilts.

organization created, called the HandyPod. The low-cost system took human waste and filtered it through a tank that created an anaerobic process to kill harmful bacteria. The sewage then would flow into a floating plant bed with hyacinth plants that eat the same nutrients bacteria need to survive. When finished, the process killed 99 percent of the harmful pathogens, like *E. coli*.

But Moore says that the HandyPod had problems. He says it was built with cheap materials to keep costs down. The pipes that connected the tank to the floating plant bed would often break apart because the system was attached to a floating house. “The structural integrity was not sufficient for holding the weight and dealing with the waves,” he says.

**Overcoming cost and cultural barriers**

Moore says that one of the most valuable lessons the students learned was how to design appropriate technologies for different cultures. He says they were put to the test when the students learned that the HandyPod had an unexpected design defect.

“The residents of the floating villages failed to keep the plants alive in the original design by Wetlands Work!,” Moore says. “When foreign entities propose a design solution for a community they all too often miss major cultural constraints and the otherwise great design fails.”

He says that when the dry season hit, residents didn’t water the plants and they would die. And that resulted in the filtration process breaking down and not removing the bacteria and pathogens from entering the water.

So two months before the students were to travel to Cambodia they were informed that Wetlands Work! had changed the design. And this meant the students had to redesign their structural improvements.

Now instead of using a plant bed, the systems use small pieces of Styrofoam in a 50-gallon drum to produce the same type of process to kill the bacteria.

Once the design was completed, the students made the long trek to Cambodia to implement their solution in the village of...
Khum Phat Sanday. The UC Davis Blum Center for Developing Economies funded each student’s travel with a $2,000 Poverty Alleviation Through Action (PATA) grant and Moore joined the students for the first 10 days of the trip.

But once they arrived in Cambodia, they faced another obstacle. Many of the houses on the lake were built on stilts. Within one month the students worked with local engineers at Wetlands Work! to create five design solutions for a sanitation system compatible with the houses on stilts in addition to redesigning the system for floating houses.

And, Moore says, they were able to dramatically reduce the price of the floating system—in some cases from a cost of $75 down to $25.

Engineering a way to improve global health

In the end, Moore and the students saw firsthand what it takes to innovate low-cost solutions to improve basic health and sanitation practices in a developing country.

One of the engineering students, Yao Guan, says he learned that you can never be fully prepared when implementing a design. And he says, most importantly, he saw that his work can have a lasting impact.

“Locals rely heavily on the lake for their livelihood, so sanitation along the lake is imperative to provide good health and living conditions,” Guan says. “Working on this project gave me great joy and pride because I can finally utilize my engineering knowledge to help others.”

Wetlands Work! will now continue to develop the students’ designs and install the sanitation systems in Tonle Sap’s communities. Looking forward, Moore says depending on the needs of the nonprofit, more mechanical and aerospace engineering students may partner with the organization again for their senior design projects.
Many College of Engineering emeriti faculty and their partners joined us at the Gun Rock Pub in September. Dean Jennifer Sinclair Curtis attended, as well as other faculty members and staff.

Emeriti Enjoyed Annual Luncheon on Campus

Victor Quintero and Sherry Batin, Engineering Student Design Center

Don and Ann Brush, Civil and Environmental Engineering

James Shackelford, Materials Science and Engineering

Len and Marilyn Herrmann, Civil and Environmental Engineering

Herman and Morgan Fink, Electrical and Computer Engineering

Pieter Stroeve and Diane Barrett, Chemical Engineering
New Frontier for Nanocrystalline Ceramics

**Professor Ricardo Castro** of the UC Davis Department of Materials Science and Engineering and his team have found a way to make nanocrystalline ceramic parts reach extraordinary levels of hardness.

The UC Davis Nanoceramics Thermochemistry Laboratory—led by Professor Castro—has developed a groundbreaking process that fabricates fully dense ceramic parts with virtually no grain growth. Nanocrystalline ceramics typically have grain sizes under 100 nanometers. Professor Castro's method produced transparent nanocrystalline magnesium aluminate (MgAl_2O_4) spinel with grain sizes of 7 nm and a record-breaking Vickers hardness of 28.4 GPa. This is even harder than sapphire that is currently used as a higher performance transparent material for application where high hardness is needed.

Classic size-effect relationships predict that decreasing grain size will increase hardness, but the phenomenon is only observed when ceramics are pore-free—a condition difficult to achieve because elimination of porosity at final stages of sintering is linked to grain growth.

Professor Castro has achieved a greater understanding of the dependence between densification and grain growth to achieve these results with the material that is regularly used for military armor.

"Magnesium aluminate spinel is the primary material of choice for stringent optical and transparent armors, with a combination of high hardness, light weight, and broadband optical properties that exceed that of competing materials, such as sapphire and AlON," Castro says. "However, high processing costs of truly dense spinel ceramics limits their market. Moreover, its hardness was not as high as sapphire, for instance."

Densification slows down at the final stage of sintering because pores become highly stable. Castro's group managed to break this stability by using pressure-assisted sintering with a punch designed to deform when the system reaches the final stage of sintering.

This advance in spark plasma sintering (SPS) process, named deformable punch spark plasma sintering (DP-SPS), uses the high heating rates of SPS. However, uniaxial pressures from SPS are not enough to induce full densification without some level of grain growth, which can form grains larger than 10 nm.

"Our results show that we can lower the sintering temperature to below 800°C, using nanoparticles as a starting material and a deformable punch in the die set that helps achieve full densification with minimal—truly minimal—grain growth," Castro adds. "The method removes residual porosity, which is critical for optical applications, by sliding the grains instead of growing them during sintering. This means very small grains that are mostly limited by initial grain size rather than by processing conditions."

Professor Castro says that the discoveries his team has made can have wide applications beyond military armor.

"The secret is the compliant punch," Castro says. "While at this point we are focused on the science behind this, I'm positive this can be scaled up. Once one can make thin nanospinel discs, cutting them with a laser will be much easier than cutting sapphire due to its isotropic properties. Moreover, with higher hardness than sapphire, this can be a scratch-free surface that largely surpasses Gorilla Glass and sapphire for display applications as well."


The Nanoceramics Thermochemistry Lab is equipped with state of the art processing equipment for advanced ceramics.
NEARLY TWENTY YEARS ago
David Spight started his career as a residence hall director and since then has been dedicated to advancing undergraduate education. Today he’s the UC Davis College of Engineering Director of Undergraduate Affairs.

Previously Spight was the Assistant Dean for Academic Advising in the School of Undergraduate Studies at the University of Texas at Austin. He is also the president of NACADA (National Academic Advising Association), a professional organization focused on enhancing academic advising with 13,000 members nationally and internationally.

Spight earned an M.A. in educational policy and administration from the University of Minnesota-Twin Cities and a B.A. in history from Truman State University. He is currently pursuing an Ed.D. in higher education administration through the University of Alabama.

As a leader of the UC Davis College of Engineering advising team Spight is developing a foundation for best advising practices. He says a key to success for advisors is thinking beyond helping students pick classes.

“It’s a more holistic discussion where people are learning more about how what they do can affect students,” Spight says. “A big part of our message is how to get more people engaged.”

Spight says one initiative underway is hiring a new advisor who will be dedicated to helping develop programs and support for first-year students. He says his office is working on improving retention rates of engineering students. The engineering curriculum is demanding and Spight says when students don’t have a support network it can lead to them dropping out of college.

He says a dedicated first-year advisor will make it easier to develop a relationship with students from the very beginning of their engineering education.

“We know that if students get connected to their fellow peers, a staff member and they get connected to a faculty member they’re exponentially more likely to graduate."

Laura Hackett Receives Outstanding New Advisor Award

A UC DAVIS COLLEGE OF ENGINEERING ADVISOR focused on helping first-generation college students has been recognized as the 2016-17 Campus Outstanding New Advisor. Since Laura Hackett’s arrival at the college in 2015, she has advised students in the Leadership in Engineering Advancement, Diversity and Retention (LEADR) Program.

After being nominated by her colleagues and students, the Outstanding New Advisor Award was selected by a committee of advisors. Hackett is universally described as kind and caring and many students say she treats them like her own children.

Hackett received a bachelor’s degree in biology and society from Cornell University in 2012. Directly after completing her master’s in Counseling-Student Affairs and College Counseling from California State University, Fresno she joined the UC Davis College of Engineering.

Tanya Whitlow, LEADR Program Director, says of Hackett, “Students gravitate to her for support and advice, which is provided with true attention to their individual cases and she often tells them, ‘I’ll be whatever you want me to be—your advisor, cheerleader or shoulder to cry on.’”

College of Engineering Undergraduate Advisor and International Academic Counselor, Jordan Dade, pointed out that Hackett has an inherent gift for working with students who are unfamiliar with college life saying, “she is the perfect balance of approachable and knowledgeable…her energy is endearing, her analytical mind is sharp, and her intuition is right on.”

This is the second year the UC Davis Office of Undergraduate Education has given the Campus Outstanding New Advisor Award. The recipient is selected from a group of advisors nominated from across the UC Davis campus.

Photo: Laura Hackett is a UC Davis College of Engineering LEADR Program Advisor and recipient of the 2016-17 Campus Outstanding New Advisor Award.
Scholarship Awarded to Mechanical Engineering Student

MARK SUSANTO, a mechanical engineering sophomore and Leadership in Engineering Advancement, Diversity and Retention Program (LEADR) student, was recently awarded the “Latinos in Technology” scholarship. Funded by the Hispanic Foundation of Silicon Valley, the scholarship recognizes outstanding undergraduate Latino students in STEM fields. The scholarship aims to address the education gap among Latinos in Northern California and close the employment diversity gap in the tech industry. Susanto is originally from San Mateo, California.

Latinos in Technology Scholarship Awarded to Mechanical Engineering Student

CONGRESSMAN JOHN GARAMENDI honored Jean VanderGheynst during the 2016 Women of the Year Awards ceremony in October. The award recognizes outstanding women of the 3rd Congressional District.

Jean VanderGheynst is Associate Dean for Research and Graduate Studies and Professor of Biological and Agricultural Engineering in the UC Davis College of Engineering.

VanderGheynst’s research focuses on next generation biofuels and bioproducts and agricultural biotechnology. Current projects examine the management of microbial communities in applications including water treatment, food and energy production, and soil treatment for the control of pests and pathogens.

More than $9 million of her extramural funding at UC Davis has been in support of undergraduate and graduate student preparation in engineering. This includes a National Science Foundation (NSF) GK-12 award to improve leadership, communication and collaboration skills, and teaching capabilities for engineering graduate students pursuing research in the areas of renewable energy, climate change and environmental sustainability.

In 2016 VanderGheynst received the UC Davis Distinguished Postdoctoral Scholar Mentoring Award, in 2005 the Farrall Young Educator Award from the American Society of Agricultural and Biological Engineering for excellence in teaching, and in 2003 she received the Outstanding Mentor Award from the UC Davis Consortium for Women and Research Advisory Board for mentoring women’s research.

Congressman John Garamendi’s 2016 Women of the Year awards are an effort to publicly honor outstanding women of the 3rd Congressional District. According to the Congressman’s website, Garamendi invited organizations and individuals from each of the eight counties—Colusa, Glenn, Lake, Sacramento, Solano, Sutter, Yolo and Yuba—to submit nominations for panel review and selection.

Woman of the Year

Jean VanderGheynst

Photo by Lucy Knowles/UC Davis

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Photo by Lucy Knowles/UC Davis

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Thanks to the generosity of many College of Engineering supporters, in fiscal year 2015-16 the college raised $18 million in gifts and grants from businesses, foundations, alumni and friends. Gifts targeted faculty research and teaching, undergraduate scholarships, graduate student awards, and equipment needs.
PROFESSOR EMERITUS WILLIAM CHANCELLOR died on February 16, 2017 at the age of 85. He was surrounded by his family and passed away peacefully.

Dr. Chancellor joined the department of Biological and Agricultural Engineering in 1957. He worked and taught on topics relating to soil mechanics, soil-machine relations, vehicle stability and traction, forage harvesting and handling, rice production and processing, economic optimization of farm equipment use, agricultural technology for developing nations, energy relations in agricultural production, and many others. He was a global authority on smallholder farm mechanization.

Building on his early interests in information theory, he was one of the first to recognize the interconnection and substitutability of information and energy in developing more advanced, efficient and sustainable food production systems. With an encyclopedic knowledge of everything in the agricultural engineering field, and many other fields as well, he was also the author of a pioneering searchable database of articles and other information that earned him a Presidential Citation from the American Society of Agricultural Engineers (ASAE, now ASABE) in 1996.

He held a deep concern for the needs and welfare of his students who have continued his work around the world. Few would have realized that Chancellor retired in 1994, after 37 years with the University, as he remained a notable presence in the department and on campus. If approached for advice or assistance, he selflessly shared his experience, insight, and wisdom.

He was the recipient of numerous awards including election to the National Academy of Engineering in 2005. Prior to his passing and in recognition of his great service to the campus, he was awarded the UC Davis Medal that will be presented in his honor at the College of Engineering commencement in June.

– Biological and Agricultural Engineering staff

Memorial Symposium

We hope that you can join us to celebrate Professor Chancellor and to honor this remarkable and inspiring teacher, mentor, scholar and friend.

Friday, July 21, 2017
2:30 – 5 p.m.
Reception: 5 – 6 p.m.
Dinner: 6 p.m.
Conference Center, University of California, Davis

“Bill was a brilliant scholar, teacher, and mentor. His passing is a great loss for the department and the University,” said Biological and Agricultural Engineering Department Chair, Dr. Bryan Jenkins. “My condolences to his wife and daughter and the rest of his family and friends who have been steadfast in their support. Bill will be well remembered.”

Memorial Fund Established for Dr. Chao Wei Yu

DR. CHAO WEI YU passed away November 1, 2016 at the age of 35 after a long battle with cancer. Chao Wei was a postdoctoral scholar in the UC Davis Department of Biological and Agricultural Engineering. He was a great friend of the College of Engineering, a true scholar, and inspiring teacher and mentor.

A memorial fund has been developed in Chao Wei’s name. This fund honors Chao Wei’s memory by supporting scholarship awards to students who aspire to achieve as he did in finding innovative solutions to some of our most challenging problems, and who have made a commitment to mentoring and educating future STEM leaders.

While at UC Davis, Chao Wei earned B.S., M.S., and Ph.D. degrees in Biological Systems Engineering. He continued research as a postdoctoral scholar contributing to collaborative research efforts between UC Davis and Lawrence Livermore National Laboratory on improving the conversion of cellulosic biomass to biofuels. Chao Wei is survived by his wife, Yiachen, son, Lucas, mother, Shu Chen, father, Ming-Chang Yu, and sister.
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