

ARIZONA ENGINEER

COLLEGE OF ENGINEERING

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David Hahn

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THE UNIVERSITY
OF ARIZONA

Great Expectations & Big Plans

Experiential learning, an inclusive culture and research that pushes the limits are top of mind for 14th dean.



I INHERITED TREMENDOUS potential when I joined the college in July 2019 and appreciate everyone who has contributed to its teaching and research excellence. Thanks to the wisdom of my immediate predecessors – Jeff Goldberg and Larry Head – dedicated faculty and staff, generous alumni and partners, and accomplished students, the college is well positioned to grow and meet the needs of a changing world.

We will make even greater discoveries, pioneer technologies that improve even more lives, and turn out more students even better prepared to take on global challenges.

Priority No. 1: Student Learning

Students are the beating heart of the college, and their learning, in and out of the classroom, is our highest priority.

In October, I announced a long-time-in-the-making transformative gift that establishes the Craig M. Berge Engineering Design Program and Craig M. Berge Dean's Chair. The program integrates design throughout the undergraduate curriculum, building on experiential strengths of the college's introductory and capstone courses. The newest course, Meeting Community Needs With Engineering Design, launches in spring 2020. As midlevel students gain valuable design experience, local organizations will benefit from their projects.

Many engineering schools offer hands-on introductory and senior design courses. Few programs provide the value our industry partners get. Fewer still systematically make design a priority for students at all levels. We are grateful to Nancy Berge and her family for making this gift in honor of mechanical engineering alumnus Craig Berge, who was an engineer, business owner and community leader. The design program differentiates the college and will help increase and diversify enrollment.

At the Top of Our Game

University leadership gained two engineers in 2019: Liesl Folks, senior vice president for academic affairs and provost, and Elizabeth R. "Betsy" Cantwell, senior vice president for research and innovation. We are proud they hold academic appointments in the college.

Faculty are moving research forward at the speeds of light and sound – in quantum communication and hypersonic flight. This year saw tens of millions of dollars in grants for projects such as a bioinspired cybersecurity system and smartphone norovirus detector.

Finally, we hope to see you at the Craig M. Berge Engineering Design Day on May 4. I'll be collaboratively sponsoring a project with Biosphere 2. Stop by and see what our students come up with! From a taquito rolling machine for a Tucson business to a seizure detection device that could save lives worldwide, this is a can't-miss annual showcase of seniors' work.

Bear Down!

Wishing you all the best in the new year and new decade,

A handwritten signature in black ink that reads "David W. Hahn". The signature is fluid and cursive, with a large initial "D" and "H".

David W. Hahn

Craig M. Berge Dean, College of Engineering

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COVER PHOTO

David W. Hahn became the College of Engineering's 14th dean on July 1.

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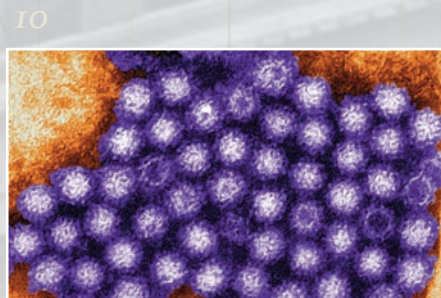
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Arizona researchers and the next generation of engineers advance space exploration technology with a \$3 million NASA grant.

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David Hahn, the new Craig M. Berge Dean of the University of Arizona College of Engineering

“If you want to do something to benefit society, benefit people, benefit the planet, I would tell anybody, ‘Engineering’s your place. It can empower you to do anything you want to do.’”

DAVID W. HAHN, *Craig M. Berge Dean, College of Engineering*

Welcome, Dean David Hahn!

New college head sees engineering education as a foundation to benefit the world.

THE UNIVERSITY WELCOMES David W. Hahn as the Craig M. Berge Dean of the College of Engineering. Hahn is focused on fostering diversity across the college, providing experiential learning programs, expanding industry and community partnerships, and advancing collaborative research. He assumed the leadership role on July 1, 2019.

“The University of Arizona has so much positive change going on right now, with a new provost, new deans and a new, visionary president,” Hahn said. “My vision for the college is fully aligned with the strategic plan of the university.”

Hahn was on the faculty at the University of Florida for 20 years, including eight as head of the Department of Mechanical and Aerospace Engineering. He oversaw the construction of a 4,000-square-foot student design center and increased the number of female BS graduates in his department to 20%, about 50% above the national average.

Hahn, who earned his bachelor’s and doctoral degrees in 1986 and 1992 in mechanical engineering from Louisiana State University, has a background in thermal sciences with a specialty in heat transfer. Over the course of a career in government agencies, national laboratories and higher education, he has found that engineering principles can be useful in many professions.

“I think engineering is an outstanding foundation for whatever you want to do in life,” he said. “It is a fantastic baseline for how to attack problems, how to approach things analytically, and how to use math and other tools to design solutions and innovate.”

‘Engineering Is Your Place’

Hahn is dedicated to increasing diversity and inclusiveness while giving students more hands-on learning opportunities that prepare them to address some of today’s most pressing issues, such as food and water, energy, health care, and security.

“I can say firsthand from observing the interaction of diverse groups that having such a team always brings more creativity,” he said.

Hahn is a firm believer that an engineering education can take a person anywhere, but he’s particularly fond of working in academia, where researchers have the intellectual freedom to pursue what interests them and help shape the next generation of engineers.

“If you want to do something to benefit society, benefit people, benefit the planet, I would tell anybody, ‘Engineering’s your place,’” Hahn said. “It can empower you to do anything you want to do.”

Hahn and his wife, Allison, are getting acclimated to life in Tucson as they explore the region’s hiking and take trips up to Mount Lemmon. The Hahns have two daughters and one son, along with a dog, Ophelia, who is embracing her role as part of the Wildcat family.

Transformational Gift Funds Four-Year Design Program

A TRANSFORMATIONAL GIFT from the Berge family, made in honor of mechanical engineering alumnus Craig M. Berge, is establishing a four-year undergraduate design program and endowing a dean's chair.

"This gift enables us to take a quantum step forward in making the University of Arizona the kind of a destination where students want to come because of the richness of our curriculum and the unique things that we're doing," said David W. Hahn, the newly named Craig M. Berge Dean of the College of Engineering.

The college has a longstanding tradition of providing opportunities for experiential learning in addition to its technical and research excellence. Students first experience designing, prototyping and building in the ENGR 102 introductory course

when they compete in the Solar Oven Throw Down. In the Interdisciplinary Capstone course, they spend an

academic year working with industry partners to invent solutions to real-world problems.



Craig M. Berge. (Courtesy of the Berge family)

The Craig M. Berge Engineering Design Program helps bridge the gap between these two experiences, starting with a new course in spring 2020, Meeting Community Needs With Engineering Design. The program incorporates into the curriculum not only community service projects, but also business instruction, entrepreneurial opportunities and major-specific design courses.

The program reinforces the college's commitment to preparing students to solve some of the world's greatest challenges, such as generating new forms of sustainable energy, strengthening cybersecurity methods, and delivering quality health care, food, and clean water to all communities.

OLD ENGINEERING CELEBRATES 101 YEARS

The Engineering Building, which houses the biomedical engineering and systems and industrial engineering departments, has been with the college through 14 deans, growth from five majors to 15, and several decades' worth of rowdy St. Patrick's Day rituals.

The building was added to the National Register of Historic Places in 1986 for its contribution to the cultural heritage of Arizona and educational and architectural significance. Over the years, it has been the place for study sessions, pancake breakfasts and the start of lifelong love stories.

Gene Tobey, who graduated with BS and MS electrical engineering degrees in 1959 and 1961, recalls working in the numerical analysis lab at the rear of the building when a young woman walked in looking for a job. Marylyn Schumann got the computer programmer position and went on to become the first woman to graduate with a four-year University of Arizona chemical engineering degree. She also became Tobey's wife.

"That's what they call a pioneer," said Marylyn Tobey, class of 1961.



The Engineering Building in 1956. (Courtesy of University of Arizona Libraries, Special Collections)

A LAB IN SPACE FOR STUDYING ASTEROIDS

Researchers collaborate with the next generation of scientists and engineers on the future of space technology.

THERE ARE MANY reasons to study asteroids – from the way they affect humans when their orbits cross paths with Earth and the clues they hold about the origins of planets and life to their potential as sources of spacecraft fuel. But it's difficult and expensive to send missions to these relatively small rocky worlds revolving around the sun, and it's impossible to simulate their low-gravity environments on Earth for long durations.

Jekan Thanga, head of the University of Arizona SpaceTReX Laboratory and assistant professor of aerospace and mechanical engineering, is leading a team that plans to build a lab in space to address the problem.

“We are coming up with an asteroid proving ground without having to go to an asteroid,” Thanga said. “This is a whole different way of doing science.”

The \$3 million NASA-funded project, which will also give students from underrepresented backgrounds

“We are coming up with an asteroid proving ground without having to go to an asteroid. This is a whole different way of doing science.”

JEKAN THANGA,
head of the SpaceTReX Laboratory and assistant professor of aerospace and mechanical engineering

research and design opportunities, was selected through NASA's Minority University Research and Education Project Institutional Research Opportunity, or MIRO. The university, designated a Hispanic-Serving Institution in 2018, is one of eight institutions to receive a share of more than \$8.2 million awarded through the program.

The team intends to re-create the surface environments of asteroids by placing asteroid origins satellites, or AOSATs, into low Earth orbit. AOSATs are small laboratories containing asteroid material that came to Earth in the form of meteorites. Rotating at about the speed of the second hand on a clock, each AOSAT will generate a centrifugal force equivalent to an asteroid's extremely low surface gravity.

Because it's less expensive and easier to operate AOSATs in low Earth orbit than it is to spend hundreds of millions of dollars traveling all the way to an asteroid, the laboratories will provide repeated opportunities for basic science and act as a test bed for asteroid-bound hardware.

Students from the University of Arizona, Pima Community College and the University of Puerto Rico are expected to build three AOSATs, each about the size of a loaf of bread. They will operate the satellites in low Earth orbit, conducting basic research on their simulated “patch of asteroid.” Research areas include extracting water for conversion into rocket fuel, testing robotic devices capable of



Jekan Thanga. (Photo by Charlie Leight)

digging and planting sensors on an asteroid, and sending bursts of gas and firing small projectiles into low-gravity asteroid surfaces.

“We would like to build a pipeline of students working with professors to conceptualize, design, build and fly CubeSats at the University of Arizona,” Thanga said. “We're looking to the day in the future where sending a CubeSat to space might be as easy as sending a payload up on a balloon flight to do an experiment in high altitude.”

The researchers envision AOSATs as a precursor to significantly larger centrifugal spacecraft that act as a semipermanent proving ground in low Earth orbit. This accessible facility would enable researchers to realistically test how an entire lander or an astronaut might interact with an asteroid surface. Deputy principal investigator of the project and Lunar and Planetary Laboratory professor Erik Asphaug calls this setup a “persistent link” between distant asteroid environments and the Earth. Such a facility could even be used to re-create a “patch of the moon” where astronauts train and adapt to low-gravity lunar conditions.



Sunny Day, Cool Cats—Proud Wildcats for Life show off their school spirit at the College of Engineering Homecoming tailgate.

HOMECOMING 2019: *Bear Down and Forge Ahead* Alumni celebrate timeless traditions and envision all-encompassing engineering.

UNIVERSITY OF ARIZONA College of Engineering faculty members, staff, students, friends and alumni – ranging from the Class of 1951 to the Class of 2019 – gathered at the 56th annual Engineers Breakfast on Friday, Nov. 1.

David W. Hahn, Craig M. Berge Dean, spoke about standout research in hypersonics and quantum computing. He thanked the Berge family for a

transformational gift, which endowed the dean's chair and is supporting a four-year undergraduate design program. He also recognized the college's 2019 alumni award winners.

"I've been amazed every day over the last four months by all that is happening on this campus," he said.



Wilma Wildcat

Andy Harris, recipient of a 2019 University of Arizona Alumni Achievement Award, gave the keynote address. He focused on what it takes to transform jojoba beans into a sustainable oil alternative for products such as makeup and body wash.

"From mechanical to civil to agricultural to environmental to systems and process engineering," he said, "all of these different things bring a seed from the desert into a usable oil form."

University President Robert C. Robbins also spoke at the breakfast, stressing the college's importance to the university – and the world.



Andy Harris

"I've been amazed every day over the last four months by all that is happening on this campus."

DAVID W. HAHN, Craig M. Berge Dean, College of Engineering



Golden Engineers—The Class of 1969 celebrated their 50th college reunion at Homecoming 2019.

Class of 1969 Reunites

A GROUP OF young men and women graduated from the University of Arizona in 1969 with engineering degrees and headed off to start their jobs and lives. Several reunited at Homecoming 2019 to catch up on 50 years of exploring the world, climbing corporate ladders and engineering a better future.

John Bernal was the U.S.-Mexico commissioner for the International Boundary and Water Commission. Kent Erwin, whose career took him to nine countries, says the best piece of advice he got in college was, “If you have something to say, say it and sit down.” Scott Roberts married just before graduating, so the

class reunion came on the heels of his 50th wedding anniversary. Paul Smith hauled a ton of snow from Flagstaff to build a 9-foot snowman for a long-ago Homecoming. Humberto Teran made lifelong friends hanging out in Louie’s Lower Level in the basement of the Student Union. Rick Whitaker, who served and met his wife in the U.S. Air Force, is a flight instructor these days.

Others at the reunion included C. Thomas Bethard, Sandra Bidwell, Dennis Donovan, George Frondorf, Donald Ganas, Mary Habeeb, David Healey, Edwin Konrath, Alfred Obermaier, Thomas Strong and Edward Trujillo.

Departments Dig In

The civil and architectural engineering and mechanics luncheon featured a talk by professor Tribikram Kundu on using ultrasonic waves for structural health monitoring. Sam Credio, Melvyn Green, Jeff Hunt, Mike Nelson, Michael Ortega, Nathan Palmer and Kristina Swallow received alumni awards.

At mining and geological engineering’s 14th annual Lacy Lecture, Jean Savage, vice president of Caterpillar’s Surface Mining & Technology Division, discussed autonomous technology in mining.

“You need less equipment to do the same amount of work,” she said. “You may be down to a mine with just 30 people on site and most of them back in that operation center, out of harm’s way.”



John Kemeny and Jean Savage

2019 ALUMNI AWARD WINNERS



Alumnus of the Year

Mike Hoover

BS mechanical engineering, 1983



Bear Down Award

Don Newman

BS engineering math, 1971



Professional Achievement Award

Bob Rutherford

BS aerospace engineering, 1978



Young Alumni Volunteer Award

Christopher Stemple

BS electrical and computer engineering, 2010; MS engineering management and biomedical engineering, 2011

Smartphone Device Detects Norovirus

Researchers strike a balance between sensitivity and affordability with a new way to identify gut-wrenching microbe.

USING EASILY ACCESSIBLE, inexpensive components – paper-based microfluidic chips and a smartphone microscope and application – a team of University of Arizona researchers has created a simple, portable method for detecting extremely low levels of norovirus in water.

“You don’t have to be a scientist or an engineer to run the device,” said Jeong-Yeol Yoon, one of the project leaders and a professor of biomedical engineering and biosystems engineering. “Analysis will be done automatically by the smartphone app, so all you have to worry about is loading a sample of water onto the chip.”



contaminated food or water. Just 10 particles of the virus can make a person sick.

Devices to detect norovirus in small quantities do already exist, but they typically require a laboratory setting with an array of microscopes, lasers and spectrometers that costs thousands of dollars.

“Advances in rapid monitoring of human viruses in water are essential for protecting public health,” said Kelly A. Reynolds, co-lead on the project and chair of the Department of Community, Environment and Policy in the Mel and Enid Zuckerman College of Public Health. “This rapid,

Norovirus is a highly infectious microbe that sickens about 20 million people in the United States and causes 200,000 deaths globally every year. People get the illness from

low-cost water quality monitoring technology could be a transformational tool for reducing both local and global disease burdens.”

Team Models Cybersecurity System After Human Body

Electrical and computer engineers train the next cybersecurity workforce to be on the offense.

A WOMAN TOUCHES a hot stove, but thanks to the nervous system, she snatches her hand away before she gets burned. A virus enters the body, but the

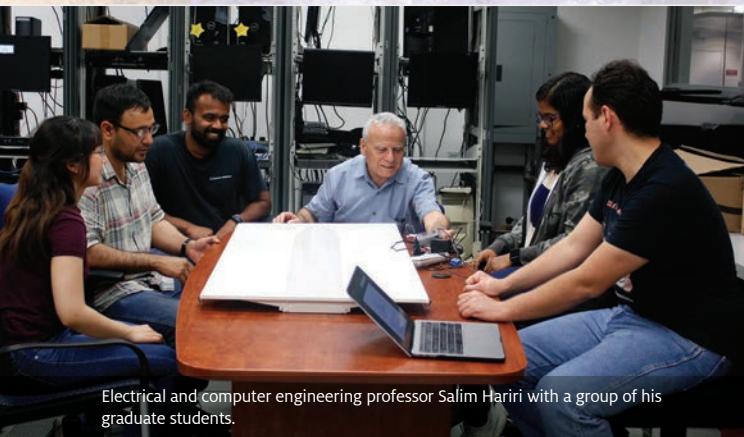
Nuclear Security Administration’s Minority Serving Institution Partnership Program is funding the project, which provides training and research opportunities to students from underrepresented backgrounds.

Gregory Ditzler, an electrical and computer engineering assistant professor. “But how can you be prepared to recognize other dangers, like putting your hand in a toaster? This is where machine learning comes in.”

The University of Arizona, designated a Hispanic-Serving Institution, is collaborating with Howard University, Navajo Technical University and Argonne National Laboratory on the Partnership for Proactive Cybersecurity Training project.

Cybersecurity is paramount for governments and companies managing large quantities of information, but it’s also an important consideration for anyone who owns a computer or smartphone.

“You carry around this phone that’s networked to all kinds of servers, and your information is very vulnerable,” said Tamal Bose, ECE department head and a co-investigator on the project.



Electrical and computer engineering professor Salim Hariri with a group of his graduate students.

immune system fends off the invader before it can cause too much damage.

College of Engineering researchers are developing a form of cybersecurity inspired by these human biological systems that detect and address threats in their earliest stages. A \$3 million grant from the National

“I felt we could learn about how the body protects us by reacting to threats and apply it by building a ‘cyber immune system,’” said Salim Hariri, electrical and computer engineering professor and the project’s principal investigator.

The method uses artificial intelligence to teach machines to recognize and counter cybersecurity threats on their own.

“Once you put your hand down on that stove, you know not to touch it again because it’s hot,” said co-investigator

The Power of an Engineering Degree

UNIVERSITY OF ARIZONA engineering degrees have propelled alumni into the tech sector as entrepreneurs, into academia as researchers and even out of this world as astronauts. For the leaders of Tucson Electric Power and the Salt River Project, “power” is in a class of its own.

Mike Hummel, who earned a BS in electrical engineering in 1982, is general manager and



CEO of the Salt River Project, which provides water and power to more than a million

people in central Arizona. David Hutchens received a bachelor’s degree in aerospace

engineering in 1988 and is president and CEO of Tucson Electric Power. TEP delivers power to more than 427,000 people in the Tucson area.

“The problem-solving that you learn in engineering can’t be replicated really anywhere else,” Hutchens said. “If you’re going to study engineering or science, the University of Arizona is a great school to do that.”

ALUMNI HIGHLIGHTS

SIE Honors Marla Peterson

The Department of Systems and Industrial Engineering selected **Marla Peterson**, a 1983 systems engineering graduate, as 2019 Alumna of the Year for her exemplary career, dedication to fostering diversity and commitment to mentoring students. She started her career 37 years ago with Garrett Turbine Engine Co., now Honeywell, and has been there ever since.

“The university definitely provided me a career I wouldn’t have had if I hadn’t found the SIE department,” said Peterson. “My blood is red and blue, so I really enjoy being on campus and meeting other Wildcats.”



Young-Jun Son and Marla Peterson

Mining 360 Goes Full Circle

Rosa Maria Rojas, who received her MS in mining engineering in 2013, is lead professor and program manager for Mining 360 and assistant professor of practice in mining and geological engineering.

Mining 360, a one-year certificate program jointly administered by the Department of Mining and Geological Engineering and Caterpillar Inc., graduated its third class in August 2019. The 16 individuals from across five countries deepened their knowledge of the mining industry and joined Rojas as proud Wildcat alumni.

“We look forward to your contributions to the world of mining now that you speak the language of mine engineers,” Rojas told the graduating class.

Keen on Teaching

Seunghan Lee and **Sara Masoud** discovered a love of teaching while earning their

doctoral degrees in systems and industrial engineering.

They graduated in summer 2019 and transferred their passions to academic positions in industrial and systems engineering – Masoud as an assistant professor at Wayne State University, and Lee as an assistant professor of teaching at the University at Buffalo.

“Sara and Seunghan have been truly outstanding PhD students, and I am sure both of them will become stellar professors,” said their adviser, SIE department Head Young

OSIRIS-REx Involvement

Two University of Arizona alumni involved with the OSIRIS-REx mission were recognized in 2019.

Daniel Wibben, who earned a BS in aerospace engineering and MS and PhD in systems engineering, received NASA’s Exceptional Engineering Achievement Medal. He works as a maneuver design



Bradley Williams

lead at aerospace company KinetX Inc., where he helped the mission claim two Guinness World Records: smallest object orbited by a spacecraft and closest orbit of a planetary body.

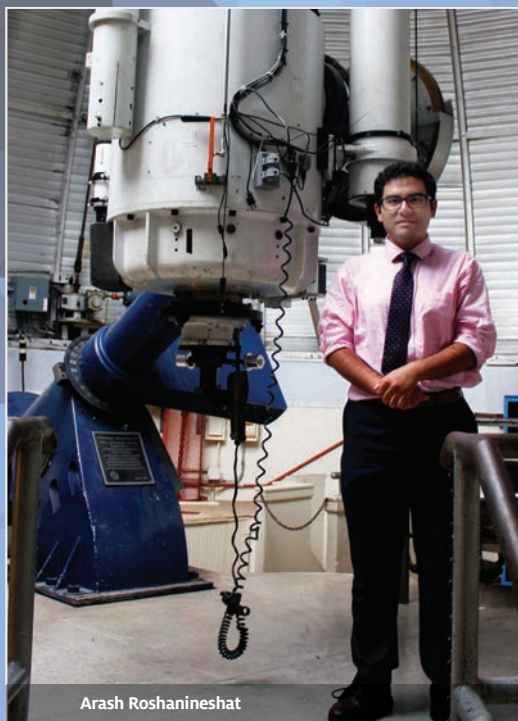
Bradley Williams, who earned a BS in mechanical engineering in 2013 and MS in systems engineering in 2018, is among 30 members of the 2019 Flinn-Brown Civic Leadership Academy training to be Arizona public policy leaders. He works as the deputy payload manager for the GUSTO long-duration balloon mission.

Grad Student Helps Capture First Image of Black Hole

A RASH ROSHANINESHAT does his stargazing with the high-powered equipment of the Steward Observatory as part of the global Event Horizon Telescope collaboration. His digital signal processing skills helped the team capture the first image of a black hole earlier this year. It took hundreds of people and years of effort to capture the first direct visual evidence of the black hole in a massive galaxy 55 million light-years from Earth. The discovery has generated much excitement, and now the group is working on capturing images of other supermassive black holes.

Roshanineshat is a doctoral student majoring in electrical and computer engineering and minoring in astronomy at the University of Arizona.

"I've always been interested in looking at the sky," he said. "But I didn't know I could work on this subject while I was doing my studies in electrical engineering."

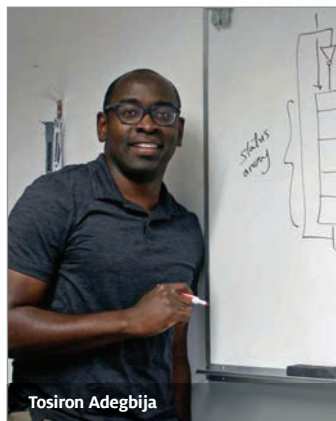


Arash Roshanineshat

Faculty Roundup

THE COLLEGE OF ENGINEERING welcomed 11 new faculty members in 2019. They include: **Kyle Hanquist** and **Bernard Parent**, aerospace and mechanical engineering; **Elizabeth Hutchinson** and **Jil Tardiff**, biomedical engineering; **Byron Hempel**, **Vicky Karanikola**, **Suchol Savagatrup** and **Songtao Xie**, chemical and environmental engineering; **Quntao Zhuang**, electrical and computer engineering; **Andrew Wessman**, materials science and engineering; and **Sol Lim**, systems and industrial engineering.

Electrical and computer engineering assistant professor **Tosiron Adegbija** received a five-year, \$500,000 Faculty Early Career Development Award from the National Science Foundation. He plans to use the award to expand his STEM outreach efforts and involve more students in his research into energy-efficient computers.



Tosiron Adegbija

Phononics 2019, one of the premiere international conferences in the field of phononics and acoustic metamaterials, drew experts from around the world to the University of Arizona campus in June. **Pierre Deymier**, head of materials science and engineering, served as conference chair.

Former dean of the College of Engineering **Jeff Goldberg** was appointed dean emeritus after 34 years at the University of Arizona. He joined the college in 1985 as an assistant professor of systems and industrial engineering and recently served as the university's interim

senior vice president for academic affairs and provost.

The Office of the Provost for the university named **Ming Li** a Distinguished Scholar, for outstanding contributions in teaching, research and outreach. The associate professor conducts cybersecurity research in the Department of Electrical and Computer Engineering. Only three to four midcareer faculty are selected for the honor each year.

On the 10th anniversary of the Energy Frontier Research Centers program, the U.S. Department of

Energy recognized **Erin Ratcliff** as one of three individuals who exemplified the centers' mission. The assistant professor of materials science and engineering joined the Center for Interface Science: Solar Electric Materials in 2009, when the university

was awarded \$15 million by the DOE to lead the project.

Twelve University of Arizona graduate students, including several engineers, are teaming up with Diné College undergraduates to design an inexpensive, mobile, solar-powered water filtration system that provides 30 Navajo families with 50 gallons of safe, clean water each day. The students are in the first cohort of a five-year, \$3 million NSF training project led by Karletta Chief in the College of Agriculture and Life Sciences. A number of engineering faculty members, including **Robert Arnold**, **Murat Kacira**, **Kimberly Ogden**, **Erin Ratcliff** and **Kelly Potter**, are involved.



Dylan Moriarty (Photo: David Courmoyer, courtesy of AISES Winds of Change magazine)

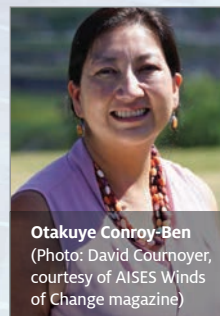
Innovator award in 2018 for her digital pull planning efforts at Los Angeles International Airport. The Turner Construction engineer is currently working on the LA Stadium & Entertainment District in Inglewood, and was profiled in the architecture, engineering and construction publication StrXur earlier this year.

Dylan Moriarty, BS/CE 2012, received the Most Promising Engineer or Scientist award from the American Indian Science and Engineering Society. Moriarty, who also holds an MS in energy resources engineering from Stanford University, is a geoscience engineer at Sandia National Laboratories.

2000s

John McCloy, MS/MSE 2007 and PhD/MSE 2008, now a professor of mechanical and materials engineering at Washington State University, received a Fulbright award to study radioactive waste management and nuclear waste deployment at the Immobilisation Science Laboratory at the University of Sheffield in the United Kingdom.

Otakuye Conroy-Ben, MS/EnvE 2004 and PhD/EnvE 2006, received the 2019 Technical Excellence award from



Otakuye Conroy-Ben
(Photo: David Courmoyer, courtesy of AISES Winds of Change magazine)

the American Indian Science and Engineering Society. The assistant professor of sustainable engineering and the built environment at Arizona State University conducts research primarily

about wastewater, and she also mentors Native American students.

The Geico board of directors elected **James Jones**, BS/ChE 2003, as assistant vice president of claims for the

company's regional office in San Diego. Jones joined the company in 2003 as part of the Emerging Leaders Program.

1990s

Arturo Ruiz-Yeomans, BS/ChE 1997 and PhD/ChE 2003, co-founded a brewery in Gilbert, Arizona, this year with five of his fellow Intel employees. The chemical engineer is the mastermind behind Desert Monks Brewing Co.'s recipes, which include ingredients such as Oreos, guava and chiles.



Arturo Ruiz-Yeomans

UNS Energy's board of directors named **Susan M. Gray**, BS/EE 1996, as president of UNS Energy, Tucson Electric Power and UniSource Energy Services, effective Jan. 1, 2020. She started at TEP 25 years ago as a student intern. Current UNS Energy president **David Hutchens**, BS/AE 1988, will remain CEO when Gray assumes her new role.

2010s

During her senior year, **Cassie Pham**, BS/EngMgt 2019, interned with Apex Microtechnology, a Tucson-based subsidiary of Heico Corp. that designs and manufactures devices, including precision power analog components. Shortly after graduation, she started working at the company as a full-time supply chain analyst.



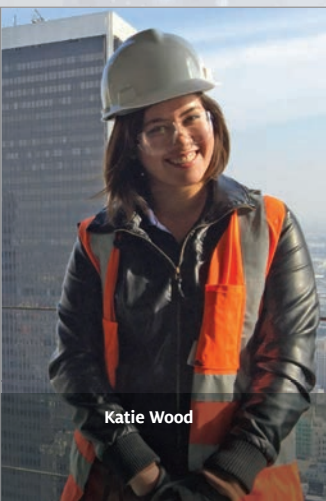
Cassie Pham

2nd Lt. **Ryan Raettig**, BS/ECE 2019, is now a commissioned engineering officer at the Air Force Institute of Technology, where he's earning a master's degree in electrical and computer engineering. He also received the AFCEA Major General Robert E. Sadler ROTC Award, an honor given to only one cadet per year nationally.

After finishing up a postdoctoral research position at the University of Washington's Sustainable Transportation Lab, **Andisheh Ranjbari**, PhD/CE 2018, joined UW's Urban Freight Lab as a research engineer in September. She

plans to explore more sustainable ways to deliver mail and packages.

Katie Wood, BS/CE 2015, won a Bluebeam Industry



Katie Wood



From intern to president: Susan M. Gray, who spoke in the college's 2019 speaker has climbed to new heights at UNS Energy.



Derek Lewis

Derek Lewis, BS/ChE 1995, has started two companies since he graduated. His diversified manufacturing business now employs 450 people in 12 facilities nationwide and

sells products in the health care, law enforcement and specialty tools sectors. He lives in Dallas with his wife and three children.

Kara Festa, BS/CE 1993 and MS/EE 1995, retired from her engineering consulting firm in June after more than 24 years in the consulting industry. In her new path, she'll be providing life and leadership coaching for women in STEM careers and business, and helping organizations prosper through focusing on people, purpose and positive impact.



Kara Festa



Paul Wood

▶ **1980s**
Paul Wood, BS/ChE 1984, served as chair for the Water Environment Federation's Nutrient Removal and Recovery Symposium

in Minneapolis in July. He is a senior associate at Lockwood, Andrews & Newnam Inc. and the chief process engineer for water and wastewater projects.

▶ **1970s**

Douglas Carlberg, BS/ME 1972, is president and chair of the board of M2 Global Inc. In July, he was reappointed to the Shingo Executive Advisory Board, which consists of company executives who have established themselves as principle-centered leaders building cultures of excellence.



Douglas Carlberg

Dwight Lind, BS/CE 1970, is both a professional engineer and a registered land surveyor. He currently works as a civil engineer for the White Mountain Apache Housing Authority, where he is responsible for the design and surveying of housing for tribal members.

Nick Schott, PhD/ChE 1971, served as chair of the University of Massachusetts Lowell Plastics Engineering Department for 18 years. Since retiring in 2010, he's been an active emeritus professor and a volunteer at the Chatham Marconi-RCA Wireless Museum in Cape Cod.



Nick Schott with wife Jean and daughter Jennifer

▶ **1960s**

Quent Augspurger, BS/ME 1960, founded the consulting firm Augspurger Komm Engineering Inc., now in its 44th year. "I got a great education at the University of Arizona that prepared me to start a firm, grow it, run it and then sell it!"



Quent Augspurger



A.J. "Tony" Coco poses with his 2019 Heritage Award from the Tustin Area Historical Society.

A.J. "Tony" Coco, BS/EE 1960, was the mayor of Tustin, California in the 1960s and 1970s. In 2019, he was named the Tustin Host Lion for Life and Lion of the Year. He also received the Heritage Award from the Tustin Area Historical Society.

A Transformative Time Made Possible by Alumni

"Hello! My name is Margie Puerta Edson, and I am the senior director of development and alumni relations for the College of Engineering."

I OFTEN TELL people that I have the best job in the world, and I mean it. I am privileged to travel the United States and meet extremely interesting people who are passionate about making the world a better place and want to give back to their alma mater.

I get to listen to their career stories and learn about their life journeys. I get to know what they have done, and – perhaps more importantly – help them with their desire to make a difference in the University of Arizona's future.

Often, I hear about their experiences as students: how they struggled, learned and grew during their time here. Many times, alumni will tell me, "You know, I wasn't the best student." They confess to having to work hard and suffer through tough classes, or share how a certain professor or club mentor helped them along the way.

Alumni cite friendships forged through long hours of study and retell exciting tales of when they "finally made it," realizing a longtime goal or passing a particularly difficult course. While our

alumni are rightfully proud of their accomplishments, many talk about how luck, great timing, and the support of parents and partners also played a part in their success on their Wildcat journeys.

Thanks to our hardworking and humble alumni, 2019 was the best year of philanthropic support ever for both the College of Engineering and the university. The college received more than \$30,300,000 in gifts from hundreds of alumni, friends, corporations and foundations.

A transformational gift named the dean's chair and a new four-year design program, additional gifts established 10 new undergraduate scholarships and two graduate fellowships, and still more gifts provided support to our Dean's Endowed Fund for Excellence and the da Vinci Circle Fund.

Certainly, hard work and perseverance – on the part of both our development team and our dedicated alumni – allowed us to have a successful year. However, I am grateful for the elements of good timing involved as well.

The gift to establish the Craig M. Berge Dean's Chair and Craig M. Berge Engineering Design Program was literally 50 years in the making, and the result of deep relationships that were forged with former deans Tom Peterson and Jeff Goldberg. The hundreds of other gifts were also the result of the life experience of each alumni donor who worked hard and, after a lifetime of success and perseverance, decided the timing was right to make their gifts and give back.

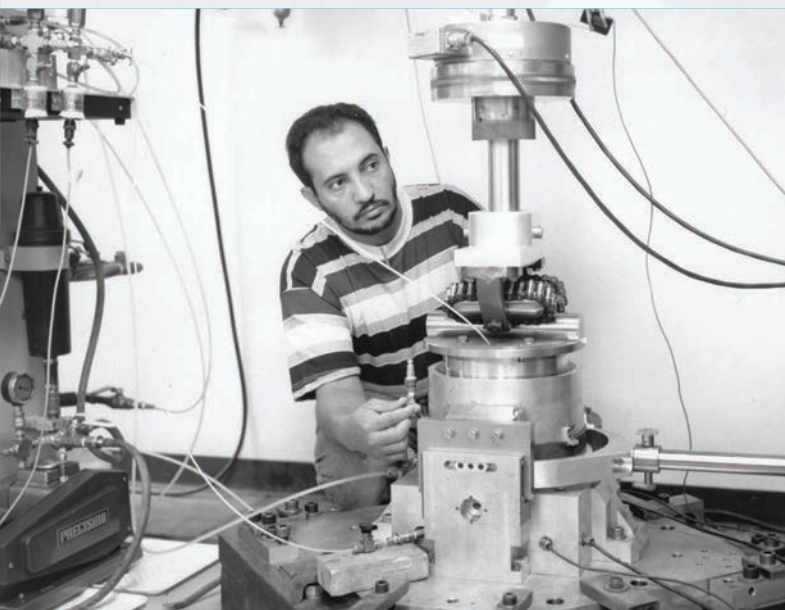
And I am the very lucky person who gets to know the story behind each gift.

Wishing you and your loved ones all the best in 2020!



Margie Puerta Edson, CFRE

Sr. Director of Development @ Alumni Relations
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FROM THE ARCHIVES

Thanks to Cemalettin Basaran, who earned his doctoral degree in civil engineering in 1994, now professor of civil, structural and environmental engineering and director of the Electronic Packaging Laboratory at the University at Buffalo, for identifying the person on the back of our last magazine cover. It is Abdulaziz Alanaz, who earned his doctoral degree in civil engineering in 1996 and became the founding rector of the University of Tabuk system in Saudi Arabia. He passed away in 2017.

Alanazy's doctoral adviser, Chandrakant S. Desai, Regents Professor Emeritus of Civil and Architectural Engineering and Mechanics, identified the machine in the photo as one he designed and developed. The Cyclic Multi Degree of Freedom device was created to test and model the joints between different materials in geotechnical and geomechanics systems.

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CALLING ALL ALUMNI!

Where has life taken you since graduation? We'd like to know and so would your college classmates. Please email us with details (about 300 words) and be sure to include the following information:

- Name and year you graduated
- Major
- Degree (BS, MS, PhD, etc.)
- Details of your activities

We'd also be interested to see – and share – pictures of your family, your latest project at work, or that boat or hot rod you just finished building in your garage. Vacation photos are great, too. We'll publish your news and photos online and in the next print edition.

Please send your email to classnotes@engr.arizona.edu

BEEN IN THE NEWS LATELY?

Let us know if you've been getting some media attention. Just email a link to us and we'll continue to spread the news via the college website and social media sites.



FROM THE ARCHIVES

This old photo has us stumped. There were no notes on the back of the print to give us a clue, so we need your help identifying the people and project.

